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The prevention of trauma reactions in police officers: Decreasing reliance on drugs and alcohol

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The prevention of trauma reactions in police officers: Decreasing reliance on drugs and alcohol

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Operational definitions

Due to the confusion about terminology used in the area of trauma, the following definitions will be used for the purposes of the current study:

- **Depersonalisation:** One of the core components of burnout, depersonalisation is a negative, cynical or excessively detached response to other people at work
- **Interpersonal support:** the participant's perception of the level of interpersonal support they have available to them, including material aid, someone to talk to about problems and someone to do things with
- **Resilience:** 'the capacity of a given system to implement early, effective adjustment processes to alleviate strain imposed by exposure to stress, thus efficiently restoring homeostatic balance or adaptive functioning within a given psychological domain following a temporary perturbation therein'
(Layne, Warren, Watson, & Shalev, 2007, p. 500)

In the current report an individual is considered resilient only if showing improvement, or a lack of deterioration, across three life domains.

The first of the domains, 'Health and Wellbeing', is assessed using the four measures of general health, affective distress (depression, anxiety and stress), drug and alcohol use, and personal relationship satisfaction. Resilience in this domain is equal to no change, or improvement across time, for all four of these measures.

The second of the domains, 'Reactivity to Trauma', will reflect the amount of posttraumatic Stress disorder (PTSD) symptomatology the individual reports having experienced following exposure to potentially traumatic policing events. A measure of PTSD symptomatology is used to assess this domain, and resilience will equal a score on this measure that is below a clinical cut-off point.

The third domain, 'Workplace Functioning' reflects the individual's ability to work and function in a stressful occupation. A measure of burnout will be used to assess this domain, and in addition the individual's use of both police and community mental health services will be measured. Resilience in this domain equals scores within the low risk range against at least two out of the three types of burnout (emotional exhaustion, depersonalisation and personal accomplishment) and not having accessed police help services, or external help services.

PTSD Symptomatology: the combined symptoms of the disorder

Executive summary

Background

Exposure to traumatic or stressful events has for some time been linked to symptoms of trauma in a minority of individuals. Although there have been many studies examining the nature and aetiology of trauma reactions, few researchers have examined whether it is possible to prevent reactions to trauma. This is somewhat surprising, given the impact that an adverse trauma reaction can have on both an individual and an organisation (if the individual is also an employee). Those at risk of exposure to traumatic events by virtue of their occupation stand to receive significant benefit from learning to manage their reactions to such events. Such a group is the police force, whose officers routinely face traumatic, sad and stressful incidents in the course of their careers.

The overall aim of this study was to develop and evaluate a resilience training program designed specifically to help new-recruit police officers mitigate stress reactions and the use of drugs and alcohol. The objectives pursued by the research team were a pointed response to the current information gap in the existing literature. There were four specific project objectives:

1. Undertake a literature review of the national and international evidence in relation to pre-event interventions designed to mitigate psychological stress reactions following exposure to a stressful event.
2. Design a pre-event intervention designed to mitigate psychological stress reactions following exposure to a stressful event.
3. Trial the pre-event intervention (resilience training) with a population at high risk of being exposed to a stressful event (police officers).
4. Collect pre-intervention, post-intervention and follow-up data as a means of evaluating the effectiveness of the intervention.

Methodology

A stratified randomised trial of resilience training was carried out with new-recruit Victorian police officers ($n = 281$). Officers were allocated to either the resilience or the control condition by virtue of the squad that they had been randomly allocated to when they entered the Victoria Police Academy (the academy). In groups, participants received either the resilience training or the control training, at different intervals over the 20 weeks they were stationed at the academy. Participants were reviewed six months after they completed their training at the academy. Resilience was conceptualised in three domains: Health and Wellbeing, Reactivity to Trauma and Workplace Functioning. The results of a 12-month follow-up of a subgroup of 92 new-recruit officers were also explored.

Key findings

Overall, the results obtained in the short term were as expected: low stress rates were reported at six-month follow-up. However, the resilience program was appreciated better than the control program during academy training and led to a disruption of the stressor–stress relationship. The 12-month follow-up suggested small to moderate effect sizes for affective reactivity in a subsample of officers, although this did not reach statistical significance because of the smaller than planned sample size. It is suggested that a proper long-term follow-up accessing the full cohort of participants is warranted.

Exploration of the primary outcome variables and pre-program attributes at six-month follow-up

- Age was found to significantly correlate with depersonalisation, with older recruits having higher levels of depersonalisation. Older participants were also found to have lower levels of affective distress than younger participants. A significant relationship was also found between age and accessing of police services: older participants accessed a greater number of police services than did younger participants.
- There was a significant relationship between personal accomplishment and gender. Males had significantly higher levels of personal accomplishment.
- Those in a relationship at the pre-program assessment were found to have significantly higher levels of general health and personal accomplishment, and lower levels of substance involvement. Single recruits had significantly higher levels of affective distress and trauma symptomatology.
- Those at city stations experienced significantly higher levels of emotional exhaustion and depersonalisation, while those in country stations reported significantly higher levels of affective distress.
- Resilience as measured by the CD-RISC (Connor–Davidson Resilience Scale) was found to correlate with general health—higher resilience scores on the CD-RISC correlated with higher general health scores. Higher resilience scores on the CD-RISC also correlated with lower affective distress scores and greater relationship satisfaction. Finally, CD-RISC scores were found to correlate with all three types of burnout—high scores on the CD-RISC were found to relate to high levels of personal accomplishment, low levels of emotional exhaustion and low levels of depersonalisation.
- Personality at intake was highly related to outcome variables.
 - Higher extroversion was associated with more substance involvement generally and more alcohol involvement specifically, as well as higher relationship satisfaction.
 - More agreeableness was associated with better general health, less distress, less workplace burnout (on all three measures of burnout) and fewer police help services being accessed.
 - High conscientiousness was associated with better general health, less distress, less general substance and alcohol involvement, higher relationship satisfaction and less workplace burnout (on all three measures of burnout).
 - Higher neuroticism (emotional instability) was found to be associated with poorer general health, affective distress, substance involvement, less relationship satisfaction, emotional exhaustion and lower personal accomplishment.
 - Openness to new experiences was associated with better general health, less burnout (depersonalisation scale) and greater personal accomplishment.
- Higher levels of optimism correlated with lower levels of affective distress, depersonalisation and emotional exhaustion. Those with higher levels of optimism also had higher levels of personal accomplishment.
- Higher trait anger was found to correlate significantly with poorer general health, affective distress, emotional exhaustion, depersonalisation and lower personal accomplishment.
- Perceived social support was found to correlate with all three types of burnout: those who reported higher levels of social support reported lower levels of depersonalisation and emotional exhaustion, and higher levels of personal accomplishment.
- Together, pre-program variables that were statistically significantly related to trauma predicted 4.5 per cent of the variance towards trauma symptomatology at six-month follow-up. This is unsurprising, as these pre-program variables do not include trauma exposure.
- However, pre-program variables (and, specifically, personality variables) predicted nearly 9 per cent of the variance in substance involvement and 14.7 per cent of the variance in affective distress.

Evaluation of the resilience training program

- Overall, 37.9 per cent of those in the resilience condition and 32.9 per cent of those in the control condition were found to be resilient across all three domains of resilience (Health and Wellbeing, Reactivity to Trauma, and Workplace Functioning).

Health and Wellbeing

- Overall, there was no significant difference between the resilience and control conditions for resilience in the Health and Wellbeing domain. Approximately half of the recruits demonstrated resilience in this domain (48.5% for the resilience condition, 56.7% for the control condition).
- There was a significant decrease in the level of affective distress over time, irrespective of condition. Overall, however, levels of affective distress were low at the pre-program assessment and remained low at six-month follow-up.
- At six-month follow-up, 51.2 per cent of all participants reported total substance involvement scores which were at risk level (for either substance use/abuse or abuse/dependence), and 56.6 per cent of participants reported alcohol involvement scores that were at risk level (for either alcohol use/abuse or abuse/dependence).
- The percentage of recruits who drank alcohol at a risky level increased from 31.8 per cent at the pre-program assessment to 56.6 per cent at six-month follow-up.
- Across conditions, 80.75 per cent of recruits reported good general health at six-month follow-up, and general health was found to increase significantly over time, irrespective of condition.

Reactivity to Trauma

- There were no significant differences between the two conditions in the level of trauma symptomatology reported. Participants in both conditions reported extremely low levels, with many recruits reporting no trauma symptoms at all.
- Two participants, both of whom were from the control condition, met criteria for PTSD. This is out of a very small 12-month follow-up group.
- The resilience training appears, at this stage, to disrupt the relationship between general stressor exposure and trauma symptoms. If this is the case, one would expect the effects to be felt more in a long-term follow-up of the whole cohort.

Workplace Functioning

- No significant difference was found between the two conditions in the domain of Workplace Functioning.
- Those in the control condition were found to have accessed both police services and external services to a significantly greater degree than those in the resilience condition.

Resilience across the three domains

- When resilience was measured across domains, the picture changed. While the majority of recruits failed to display resilience in the domains of Health and Wellbeing and Workplace Functioning, approximately one-third of recruits in the resilience condition (37.9%) and one-third of those in the control condition (32.9%) showed resilience across all three domains of resilience.
- The majority of recruits appeared to have deteriorated in the areas of affective distress, substance involvement, relationship satisfaction, general health, burnout and use of help services when their responses were compared to the responses given six months earlier—before they began working as police officers.

- There was a significant difference between the conditions in how helpful recruits considered the training handouts to be. Those in the control condition considered the handouts to be more helpful than did those in the resilience condition.

Intervention satisfaction

- Those in the resilience condition had greater satisfaction with the training both at the post-training assessment and at six-month follow-up.
- There was a significant interaction between time and condition in participant satisfaction. At both time points, the satisfaction of those in the resilience condition was greater than the satisfaction of those in the control condition. However, satisfaction of those in the resilience condition decreased over time, while satisfaction of those in the control condition increased over time.

General exploration of the outcome variables

- A significant relationship was found between trauma symptomatology and substance involvement (alcohol and drug use) at six-month follow-up. Those with higher substance involvement scores were more likely to have higher trauma symptomatology.
- Significant differences were found between the two conditions in credibility and expectancy. Those in the resilience condition found the training to be significantly more credible and had significantly greater expectancy than those in the control condition.
- Credibility ratings provided immediately after the training program were found to significantly correlate with depersonalisation. Those who rated the intervention as more credible immediately after the program reported less depersonalisation, as well as greater feelings of personal accomplishment at six-month follow-up.
- A small correlation was also found between credibility and affective distress. Those who found the training more credible experienced slightly higher levels of affective distress.
- Expectancy correlated with depersonalisation to a small degree—those with greater expectancy having lower depersonalisation.

12-month follow-up subgroup

- Within the domain of Health and Wellbeing there were no significant differences between the conditions for affective distress, relationship satisfaction, substance involvement and general health. However, if a full dataset had been collected as planned and the effect size differences maintained, there would have been significant differences in affective distress and relationship satisfaction, with the resilience-trained group scoring lower on affective distress and higher on relationship satisfaction.
- There was no significant difference between the conditions in the domain of Workplace Functioning ($p < 0.05$). However, as above, if the full sample had been assessed, there would have been significant differences in workplace burnout, with emotional exhaustion being lower in the resilience group.
- There were also no significant differences between the conditions in the domain of Reactivity to Trauma. However, as with the other indices, means displayed a trend for resilience superiority in the resilience conditions group. Had a full complement of subjects been obtained, this trend would have reached significance.
- Participants in both conditions had very low levels of trauma symptomatology at 12-month follow-up.
- One member of the control condition group met criteria for PTSD at 12-month follow-up.
- At 12-month follow-up 49.4 per cent of all participants reported total substance involvement scores at risk level (for either substance use/abuse or abuse/dependence), and 61.8 per cent of participants reported alcohol involvement scores at risk level (for either alcohol use/abuse or abuse/dependence).

- At 12-month follow-up substance involvement was found to correlate moderately with trauma symptomatology. Those with higher substance involvement were more likely to have high trauma symptomatology scores.
- General health levels were stable across time, with the majority of participants (80%) reporting good general health at 12-month follow-up.

Conclusions

This study represents the first time a resilience training program designed to inoculate emergency services personnel against job stressors has been experimentally investigated. In the study, resilience was considered in terms of three domains, enabling resilience to be broken down and evaluated in terms of specific elements. This approach highlighted the fact that the vast majority of recruits were resilient to exposure to traumatic events.

Findings at six-month follow-up that more than half of all participants reported a total substance or alcohol involvement score (51.2% and 56.6%, respectively) that was at risk level, indicate the need for policies and procedures to be put in place to identify and support those with either substance or alcohol use problems.

Twelve-month follow-up statistics showed a trend for significance in the anticipated direction, although they did not attain the desired power because only a small sample was permitted for follow-up at that point in time. Overall, the results of this study provide support for the inclusion of resilience training in the training of new-recruit police officers until further, long-term follow-ups suggest otherwise.

Introduction

When individuals are exposed to a traumatic event, a small percentage go on to develop what is known as 'Posttraumatic Stress Disorder' (PTSD; American Psychiatric Association, 1994). PTSD is a chronic, debilitating disorder characterised by feelings of fear, an increase in arousal; avoidance of stimuli associated with the trauma, and persistent and distressing re-experiencing of the event (American Psychiatric Association, 1994). The disorder often leads the sufferer to be incapacitated, both psychologically and physiologically, and to report and/or develop poor physical health (Deykin, et al., 2001; Zayfert, Dums, Ferguson, & Hegel, 2002), reduced work productivity (Kessler & Frank, 1997), and increased use of health resources (Bolton, et al., 2004; Deykin, et al., 2001; Stein, McQuaid, Pedrelli, Lenox, & McCahill, 2000).

Although a great deal of research has examined the nature and aetiology of adverse stress reactions (eg Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Kulka, et al., 1990), the pre-trauma, peri-trauma and post-trauma risks associated with the development of stress reactions (eg Breslau, Davis, & Andreski, 1995; Bromet, Sonnega, & Kessler, 1998; Green, Grace, Lindy, Gleser, & Leonard, 1990; Lauterbach & Vrana, 2001) and the most efficacious ways to treat stress reactions (eg Bryant & Harvey, 2000; N. A. Cooper & Clum, 1989; Devilly & Spence, 1999; Foa, et al., 1999; Foa, Rothbaum, Riggs, & Murdock, 1991), no-one has ever examined whether it is possible to **prevent** stress reactions. One of the primary reasons for this lack of research is that in the general population exposure to a traumatic event happens so infrequently that its occurrence is usually impossible to predict.

There are, however, several occupations that have a predictable and foreseeable risk of exposure to threat, horrific injury and death. Examples that have received notable attention in the literature include the emergency services, the military, acute medical services, bank officers and train drivers (McFarlane & Bryant, 2007). For a group such as police officers, it is known that exposure to a traumatic event is highly likely to occur— and to occur early in an officer's career.

On any given day, police officers may be faced with a vast array of situations while performing their duties. The majority of these situations are routine—involving tasks such as investigations, patrol and paperwork—yet a small number of them may be life threatening, violent, distressing or horrific (Adams & Stanwick, 2002). A recent Australian survey of 223 police officers found that each officer experienced on average nearly nine critical police incidents in a 12-month period (Hodgins, 2000). The most frequently experienced incidents were finding the corpse of someone who had died a natural death (54%), finding the corpse of a suicide victim (35%), attending traffic accidents where an adult was injured or killed (68% and 31% respectively), or having an encounter with a mentally disturbed individual who was threatening (35%). A pilot study with Queensland Police indicated that work-related traumatic events were ubiquitous—95 per cent of participants reported experiencing a work-related traumatic event at some time in their career (Rallings, 2000). It has been estimated that at any given time 15–32 per cent of all emergency responders are dealing with a reaction to posttraumatic stress and that there is a 30–64 per cent chance that they will have a negative mental health reaction to it during their lifetime (Everly & Mitchell, 1997).

It is known that emergency responders are at high risk of both being exposed to traumatic events and of developing a traumatic stress reaction, so it is important that effective early interventions are developed.

Study rationale

Although a small number of randomised controlled trials (RCTs) have indicated that intervention after symptomatic emergence is able to reduce depression and symptoms of anxiety, an RCT of the efficacy of resilience training for ameliorating stress reactions has never been conducted. A few studies have used resilience training with the aim of preventing stress reactions; however, these studies did not utilise robust, scientific designs and did not administer resilience training—as one would expect from the name—*before* any

traumatic events or trauma symptoms occurred. To address this deficit in the literature, the study's primary aim was to conduct a randomised controlled trial of resilience training to prevent stress reactions in new-recruit police officers.

Study aims and objectives

The overall aims of this study were to examine the efficacy of resilience training for police officers before they begin work in (a) enhancing resilience, (b) mitigating stress reactions and (c) reducing drug and alcohol consumption.

The objectives pursued by the research team were in pointed response to the paucity of research conducted into pre-event interventions that might be capable of mitigating psychological stress responses following exposure to a stressful event. The project explored how to best apply the existing research evidence to create a pre-event intervention. This intervention was designed by the researchers and then tested and evaluated in a group of police officers. The project had four specific objectives:

1. Undertake a literature review of the national and international evidence in relation to pre-event interventions designed to mitigate psychological stress reactions following exposure to a stressful event.
2. Design a pre-event intervention designed to mitigate psychological stress reactions following exposure to a stressful event.
3. Trial the pre-event intervention (resilience training) with a population at high risk of being exposed to a stressful event (police officers).
4. Collect pre-intervention, post-intervention and follow-up data as a means of evaluating the effectiveness of the intervention.

Report overview

- **Chapter 1** presents the formal literature review of international and Australian studies. This chapter also discusses the strengths, limitation, and salient issues borne out in the review.
- **Chapter 2** describes the development of the resilience training program.
- **Chapter 3** provides details of the method and the materials that were used to evaluate the resilience training program.
- **Chapter 4** provides a detailed description of the dataset used in the analyses.
- **Chapter 5** presents the results of resilience training program evaluation.
- **Chapter 6** synthesises the overall findings of the study and makes recommendations for future progress in this area.

Chapter 1: Literature review

This chapter contains the results of the formal literature review; to assist comprehension it has been divided into a series of subsections.

Search strategy

A comprehensive search and review of the peer-reviewed national and international literature was carried out. All available material published up to March 2009 was considered. Keyword searches were used to locate published material in electronic database—for example, Pubmed, ProQuest 5000, Academic Search Premier, Web of Knowledge—and online journals. Keywords used during the searches included combinations of resilience, inoculation, PTSD, trauma, posttraumatic, posttraumatic stress disorder, predictors, epidemiology, prevalence, drugs, alcohol, police, stress reactions, depression, burnout and coping. Research contacts were then pursued for any ‘emerging’ literature or missed studies.

Posttraumatic stress disorder

PTSD is a recognised illness associated with exposure to a traumatic event. According to the Diagnostic and Statistical Manual of Mental Disorders, version four (DSM-IV; American Psychiatric Association, 1994), six criteria must be met before a diagnosis of PTSD can be made. The first criterion, Criterion A (APA, 1994), is that a person must have experienced, witnessed or have been 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 have responded with feelings of intense fear, helplessness or horror.

This definition allows a diagnosis not only for primary victims but also for secondary or related victims, such as the family of victims and emergency workers. In addition, it allows for a diagnosis to be made when there is no direct threat to life—but when physical integrity is compromised, such as in the case of rape or child sexual abuse. A qualifier also permits the diagnosis ‘upon learning about’ such events.

The second criterion, Criterion B (APA, 1994), is that the person must have at least one of the symptoms of re-experiencing. The essential feature of this cluster of symptoms is the persistent re-experiencing of the traumatic event—for example, nightmares and flashbacks. Criterion C (APA, 1994) is that the person must exhibit significant avoidance in at least three ways. There are two distinct symptom types for Criterion C: effortful avoidance (eg attempts to avoid reminders of the event) and non-effortful avoidance (eg difficulty remembering aspects of the event). Non-effortful avoidance is sometimes referred to as ‘numbing’ or ‘dissociation’ (Foa, Riggs, & Gershuny, 1995). Criterion D (APA, 1994) is for a number of physiological symptoms. These persistent symptoms are characterised by increased arousal, not present before the trauma (eg exaggerated startle response). Criterion E (APA, 1994) is that the duration of criteria B, C and D symptoms is at least one month. Criterion F (APA, 1994), the final criterion, is that the disturbance caused by the symptoms causes significant distress or impairment in social, occupational and/or other important areas of functioning. Specifiers (descriptors) add information about the duration of the response (acute or chronic) and whether there was any delayed onset of the symptoms following the traumatic event.

Prospective studies have shown that most trauma survivors display a range of PTSD reactions in the initial weeks after a traumatic event, but that most of these people adapt effectively and display resolution within approximately three months. Those who fail to recover by this time are at risk of chronic PTSD (Blanchard, et al., 1996; Koren, Arnon, & Klein, 1999; Riggs, Rothbaum, & Foa, 1995).

Prevalence of traumatic stress and related disorders

In the Australian National Morbidity Study, Creamer, Burgess and McFarlane (2001) found an estimated 12-month PTSD prevalence rate of 1.3 per cent in the general population, with 64.6 per cent of men and 49.5 per cent of women ever having ever experienced at least one traumatic event. The lifetime prevalence of PTSD among respondents who had been exposed to a traumatic event was found to range (according to the type of trauma experienced) between 2 per cent and 65 per cent. Of those who had experienced any traumatic event, 1.9 per cent of men and 2.9 per cent of women had met criteria for PTSD in the previous 12 months.

Police officers are exposed to traumatic events as part of their occupation and are therefore at higher risk of developing PTSD than the general population. For example, Robinson, Sigman and Wilson (1997) found that 13 per cent of their sample of police officers had diagnosable PTSD, while Carlier, Lamberts and Gersons (1997) found that 7 per cent of the police officers in their sample met criteria for PTSD and 34 per cent had partial or sub-threshold PTSD. A pilot study with Queensland police officers found an 8 per cent PTSD prevalence rate for work-related events (Rallings, 2000); some studies found PTSD prevalence to be as high as 26 per cent among police officers (C. A. Martin, McKean, & Veltkamp, 1986).

A study of early retirements from the New Zealand Police found that 16.8 per cent of early retirees were diagnosed as having posttraumatic reactions, and the majority (69.2%) of early retirees cited psychological reasons for leaving (Miller, 1996 cited in Stephens & Miller, 1998). A study by Karlsson and Christianson (2003) revealed that the event most police officers considered most distressing and stressful occurred early in their careers and that 32 per cent of traumatic events experienced by the officers occurred during their first five years on the job.

Figures released by the Victorian Police Association revealed that in the 2007–08 financial year 40 Victoria Police officers were treated internally for PTSD, compared to 25 officers in 2006–07 (McArthur, 2008). With approximately 11,000 sworn-in members working for Victoria Police in 2007–08, this represents 0.36 per cent of members. However, given the fact that Workcover claims for PTSD are often rejected, and that many officers are reluctant to seek treatment, it is probable that these figures do not reflect the total number of Victorian police officers suffering from PTSD in either year.

Although there are some inconsistencies in the rates reported in the above studies, these differences may be due to the nature of the traumas and the measurements various studies used. Nonetheless, clinical observations strongly suggest that at least some emergency service workers do develop PTSD following work-related traumatic incidents (Tolin & Foa, 1999).

Comorbidity is the presence of more than one diagnosable disorder in an individual at the same time. The disorders that PTSD is most frequently associated with are depression and other anxiety disorders, alcohol and substance use, and anger and guilt (Forbes, Creamer, Hawthorne, Allen, & McHugh, 2003). The National Comorbidity Study, conducted by Kessler, Sonnega, Bromet, Hughes and Nelson (1995) in the United States, found that 88 per cent of males and 79 per cent of females with lifetime PTSD met criteria for at least one other psychiatric diagnosis.

In an epidemiological study of a group of young adults, Breslau, Davis, Andreski and Peterson (1991) found that 83 per cent of the non-veteran PTSD sample met the criteria for at least one other psychiatric disorder compared to 44 per cent of those without PTSD. The most common of these conditions were substance abuse or dependence (43%), major depression (37%) and agoraphobia (22%). In the National Comorbidity Study, Kessler and colleagues (1995) also found PTSD to be strongly comorbid with affective disorders, anxiety disorders, conduct disorders and substance use disorders. They found that 52 per cent of men and 28 per cent of women with PTSD also met the lifetime criteria for alcohol abuse or dependence. For drug abuse, the numbers were 35 per cent and 27 per cent respectively.

Substance abuse and dependence often develops as a secondary disorder when other coping mechanisms fail to comfort or reduce distress. A DSM-IV diagnosis of substance abuse is made when an individual's

pattern of consumption is maladaptive, as indicated by the occurrence of at least one of the following within a 12-month period: substance use that results in role impairment (eg failed work or home obligations); substance use in a hazardous situation (eg driving while intoxicated; substance-related legal problems); and social or interpersonal problems due to substance use.

The Australian National Morbidity Study (Creamer, et al., 2001) revealed that men with an alcohol use disorder were 6.6 times more likely to have co-occurring PTSD than men without an alcohol use disorder. Men with a drug use disorder were 7.2 times more likely than men without a drug use disorder to have co-occurring PTSD. For women the odds were 4.5 and 12.4 respectively. Among those with PTSD, the most common substance use disorder was an alcohol use disorder (24.1%), whereas among those with a different substance use disorder, PTSD was most common among individuals with an opioid use disorder (33.2%; Mills, Teesson, Ross, & Peters, 2006).

Substance abuse and dependence has consistently been shown to be comorbid with PTSD (eg Boudewyns, Woods, Hyer, & Albrecht, 1991; Breslau, Davis, Peterson, & Schultz, 1997; E. S. Brown, Fulton, Wilkeson, & Petty, 2000; Ivezia, Bagaria, Orue, Mimica, & Ljubin, 2000; Mills, et al., 2006). In a recent large longitudinal study, 988 young adults who had first been assessed while in primary school, were followed through primary and middle school into adulthood (Reed, Anthony, & Breslau, 2007).

The study found that overall drug abuse or dependence was more than four times more likely in young adults with PTSD than in those with no trauma exposure. However, exposure to a traumatic event in the absence of PTSD was not associated with an increase in risk of drug abuse or dependence. This finding was robust, even once early life experiences were adjusted for. Therefore, PTSD—but not trauma only—is clearly associated with subsequent drug use disorders. This has led to researchers stating:

Screening and interventions that more appropriately target those whose post-event disequilibria interacts with pre-existing or consequential comorbid conditions are increasingly indicated and should become a focus. Such research will ultimately lead to detection and prevention strategies. (Deville & Gist, 2008, p. 91)

Many people try to alleviate the symptoms of PTSD by self-medicating with drugs such as antidepressants and alcohol. Even in small quantities alcohol causes dysfunction in an individual due to its depressive effect on the central nervous system. This in turn causes reaction times to become slow and thinking and co-ordination to become sluggish (McNeill & Wilson, 1993). Alcohol may also cause aggressive behaviour, particularly in the presence of a threat (Zeichner, Allen, Giancola, & Lating, 1994).

Employee substance use has also been found to be associated with excessive absenteeism (Crouch, Webb, Peterson, Buller, & Rollins, 1989; Normand, Salyards, & Mahoney, 1990; Zwerling, Ryan, & Orav, 1990), accidents at work (Holcom, Lehman, & Simpson, 1993; Taggart, 1989), poor job performance (Blum, Roman, & Martin, 1993; Lehman & Simpson, 1992) and high turnover (Kandel & Yamaguchi, 1987; Zwerling, et al., 1990). Excessive use of alcohol can be a sign of self-medication, and can result in marital problems and family dysfunction.

Vulnerabilities to the development of pathology following trauma

The likelihood of developing PTSD is moderated by both trauma-specific and person-specific variables. Ascertaining exactly which factors serve as protective factors and which act as risk factors is an area of research which has received a great deal of attention in recent years. Assessing the myriad factors that can affect the development of PTSD and examining the relationship between protective and/or risk factors and resilience are two research areas requiring further development. However such an examination is beyond the scope of the current study. For the current study, factors known to cause vulnerability in individuals who are exposed to trauma are measured so that they can be taken into account when the efficacy of the police resilience program is evaluated. The following section briefly reviews these vulnerability factors.

Pre-trauma vulnerabilities

Personality

A great deal of research has been conducted to investigate whether personality is related to reactions after exposure to a traumatic event. Personality variables have repeatedly been shown to be related to posttraumatic symptom severity (eg McFarlane, 1988; Morgan & Matthews, 1995; Schnurr, Friedman, & Rosenberg, 1993; Schnurr & Vielhauer, 2000; Sutker, Davis, Uddo, & Ditta, 1995). One of the most consistent findings is the positive relationship between neuroticism and posttraumatic distress (Breslau, et al., 1991; Charlton & Thompson, 1996; Davidson, Kudler, & Smith, 1987). In order to assess for this factor, personality will be measured during the current study to check that both groups are similar in composition.

Previous trauma exposure

An association between previous exposure to traumatic experiences and posttraumatic symptomatology resulting from subsequent trauma has often been reported (eg Breslau, Chilcoat, Kessler, & Davis, 1999; Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). For example, high rates of childhood trauma were reported in Vietnam veterans with PTSD (Bremner, Southwick, Johnson, Yehuda, & Charney, 1993). Previous victimisation in women who have been raped, and previous combat stress have each been found to increase the likelihood and severity of the psychological sequelae of the later trauma (Foa & Riggs, 1993; Solomon, Mikulincer, & Jakob, 1987). Previous trauma exposure will be measured in the current study to ensure that the composition of both groups is equal for this factor.

Personal history of psychiatric disorder

People with a history of psychiatric problems appear to be at greater risk of developing posttraumatic symptoms following exposure to a traumatic incident—in particular, a history of anxiety disorder, depressive disorder, a personality disorder or alcohol abuse (Blanchard, et al., 1996; Ehlers, Mayou, & Bryant, 1998; Green, et al., 1990; Ozer, et al., 2003; Ursano, et al., 1999). In order to check that both groups in the current study have an equal incidence of psychiatric disorder, this factor will also be measured.

Gender

Community sample studies have produced evidence to suggest that women are more likely than men to develop posttraumatic symptoms (eg Beals, et al., 2005; Kessler, et al., 1995; Weaver & Clum, 1995). In a study of the effects of previous exposure to trauma, Breslau and colleagues (1999) found that men are more likely to be exposed to trauma than women, but that trauma-exposed women are more likely to develop PTSD, even when the type of traumatic event is controlled for during analyses. In addition, they found that women's higher risk of PTSD was not attributable to sex differences in their history of exposure to trauma.

Similarly, a meta-analysis by Tolin and Foa (2005) of potentially traumatic events and PTSD revealed that females are more likely than males to meet criteria for PTSD, but are less likely to have experienced potentially traumatic events. Females were found to be less likely to experience accidents, non-sexual assaults or to witness death or injury, disaster or fire, and combat or war, but they were more likely to have experienced sexual assault and child sexual abuse.

The results indicate that sex differences in exposure to particular types of potentially traumatic events can only partially account for the differential PTSD risk in males and females. Results from studies involving police officers, however, have not been consistent with these findings. Carlier, Lamberts and Gersons (1997) found no relationship between gender and posttraumatic symptomatology, while Hodgins and colleagues (2001) found that gender was not predictive of posttraumatic stress symptoms in their investigation of Australian police officers.

Peri-trauma vulnerabilities

Severity of trauma and perceived life threat

Trauma severity and perceived life threat have been found to be related to posttraumatic symptomatology in a number of studies (Donovan, Padin Rivera, Dowd, & Blake, 1996; Lauterbach & Vrana, 2001; Lee, Vaillant, Torrey, & Elder, 1995; Vernberg, LaGreca, Silverman, & Prinstein, 1996). Overall, the evidence for civilian populations suggests that events involving personal injury, forced sexual penetration, threat of death (Kilpatrick, et al., 1989) or events that are largely unpredictable and uncontrollable are associated with more severe PTSD symptoms (Foa, Zinbarg, & Rothbaum, 1992; Janoff-Bulman, 1992; Leskin, Kaloupek, & Keane, 1998).

However, research on the relationship between critical incident stressors and the presence of distress has been equivocal for emergency services personnel (see Bryant & Harvey, 1995; Carlier, et al., 1997; McFarlane, 1988). For the current study, the type of incidents that the police officers are exposed to (eg death, violence, sexual crime) and the frequency of such traumatic incidents will be measured in follow-up to verify that both groups have been exposed to traumatic incidents to the same degree.

Post-trauma vulnerabilities

Social support

After a traumatic event victims are typically in great need of support of all types. They are often very sensitive to how others react to them and to how others describe or make attributions about both the event and the role they played (Johnson, et al., 1997). The extent to which a victim's social network validates or invalidates their experience can have an important effect on their psychological adaptation following a traumatic event. This type of validation, known as 'social support', is commonly defined as 'the degree of emotional and instrumental support received by a person from the people in his or her environment' (Maercker & Müller, 2004, p. 346).

Victims who perceive themselves as receiving poor or few social supports following a traumatic event are more likely to have higher levels of post-trauma symptomatology (Cordova, Cunninghamman, Carlson, & Andrykowski, 2001; Marmar, et al., 1999; Southwick, Morgan, & Rosenberg, 2000). Likewise, studies that have explored the relationship between social support and posttraumatic symptomatology in emergency services personnel found that those who receive poor or few social supports are more likely to experience post-trauma symptoms (Carlier, et al., 1997; Regehr, Hill, & Glancy, 2000; Stephens, 1996). For the current study support will be measured to check for whether both groups received equal levels of **perceived** social support.

Optimism

Optimism is regarded as the generalised expectation of a positive outcome and pessimism as the generalised expectation of a negative outcome (Schweizer, Beck-Seyffer, & Schneider, 1999). Optimists make every effort to remain engaged with their goals, and they confront the reality of a threat; pessimists often try to ignore or wish the problem away (Carver, et al., 1993). Optimists display better physical and mental wellbeing than pessimists (Ebert, Tucker, & Roth, 2002; Peterson & Bossio, 1991; Schweizer, et al., 1999).

An optimistic disposition in the face of adversity plays an important role in a diverse range of behavioural and psychological outcomes, including faster recovery from surgery (Fitzgerald, Tennen, Affleck, & Pransky, 1993; Scheier, et al., 1989), lower illness burden after natural disaster (Costello, 1998), less distress and fewer HIV-related concerns in gay men (Taylor, et al., 1992), less distress in women following a failed IVF attempt (Litt, Tennen, Affleck, & Klock, 1992) and the mediation of distress among students who have experienced traumatic events (Brodhagen & Wise, 2008). Optimism is measured in the current study to check whether both groups have similar levels of optimism.

Anger

Anger is considered to be the experience and expression of hostile or furious feelings, which are either expressed or withheld (Spielberger, et al., 1985). It has been implicated in the development of PTSD. Riggs, Dancu, Gershuny, Greenberg and Foa (1992) found in a prospective study that one week after an assault victims had higher-state anger scores than non-victims. In addition, anger elevation at one week post assault was also found to be predictive of PTSD severity one month later. The authors suggested that this finding may be explained by a fear network conceptualisation of PTSD (Foa & Kozak, 1986; Foa, Steketee, & Rothbaum, 1989), whereby the activation of anger allows victims to avoid feelings of anxiety, impeding the processing of distress feelings.

Studies have also found a positive relationship between anger and PTSD development in survivors of motor vehicle accidents (Ehlers, et al., 1998), combat veterans (Chemtob, Hamada, Roitblat, & Muraoka, 1994) and assault victims (Andrews, Brewin, Rose, & Kirk, 2000; Koenen, Hearst-Ikeda, Caulfield, & Muldar, 1997). In most studies it is implicitly implied that the anger is a result of the trauma. However, predisposition to anger may also affect post-trauma functioning. In the current study trait anger will be measured to check whether both groups have a similar baseline level of anger.

Stress

Lazarus and Folkman (1984) conceptualise stress as a relationship between a person and the environment that is appraised by the person as being taxing or exceeding his or her resources and endangering his or her wellbeing. When a person appraises a situation as potentially stressful, they then assess their own resources for dealing with it, or their ability to cope. Coping under stress involves an active, adaptive process in which an individual employs strategies to manage a specific environment. Inadequate coping is conceptualised as occurring when an individual perceives a failure in dealing with the situation, thus resulting in stress (Biggam, Power, & Macdonald, 1997).

The stressful situation, or source of the stress, is known as the 'stressor'. The relationship between the stressor and an individual is also mediated by 'appraisal'. Appraisal is a cognitive process by which a person evaluates the consequences of an encounter on his or her wellbeing (primary appraisal) and what can be done about those consequences (secondary appraisal; Hart, Wearing, & Headey, 1993). Stressors can range from something minor, such as starting a new job or having to perform a speech, through to a major life event, such as the death of a loved one. Some short-term stress is often good for us, providing us with increased energy and tension and improving our ability to concentrate. It allows us to make an extra effort, keeps us motivated and provides us with a sense of achievement once we have successfully dealt with the stressful situation. However, if stress is intense and long-term, it can lead to exhaustion and mental and physical ill health.

The stress response of an individual is a combination of physical reactions, thoughts (cognitions), emotions and behaviours (Visides, Eddy, & Mozie, 1994). Commonly noted physical symptoms of stress are fatigue and physical weakness; migraine and tension headaches; backaches, including lower back pain; increased heart rate; a rise in blood pressure; and diarrhoea or constipation (Rice, 1999). Behavioural symptoms include procrastination, avoidance, loss of appetite and energy, absenteeism, changes in sleep patterns and an increase or change in drug and alcohol use (Hamberger & Lohr, 1984).

Some of the many emotive symptoms are anxiety, dread, irritability, depression and frustration, while the most common cognitive symptoms are loss of motivation and concentration (Berkowitz, 1990). Over the years, researchers have found links between chronic stress and a number of illnesses, including asthma, allergies and autoimmune disease (Plaut & Friedman, 1981); sleep disorders (Waters, Adams, Binks, & Varnado, 1993); migraine (Wilkins & Beaudet, 1998); skin conditions (Al' Abadie, Kent, & Gawkrödger, 1994); heart problems (Anderson, 1989); and peptic ulcers (Pinkerton, Hughes, & Wenrich, 1982).

Occupational stress

Occupational stress has been defined by many researchers (eg Cox, 1978; Cummings & Cooper, 1979; Quick & Quick, 1984) as arising from work demands or expectations that a worker perceives to be beyond their skills, abilities and coping strategies, and that also have negative mental and physical health consequences. While some forms of stress may actually increase worker productivity, if the burden is too great, job performance will be impaired. The major sources of occupational stress—stressors—have been divided into seven categories: work control; job-intrinsic factors such as work overload and lack of job variety; interpersonal relationships; career development (under- or over-promotion); organisational climate; and home-work interface (Sparks & Cooper, 1999).

Occupational stress has been conceptualised in terms of stressors and strain, presuming that adverse work experiences (stressors) cause psychological and behavioural strain (eg Greller, Parsons, & Mitchell, 1992). However, more recently, evidence is emerging that the organisational context may exert a much stronger influence on outcomes related to employee wellbeing than has previously been recognised.

Hart and Cooper (2001) proposed the organisational health framework as an alternative to the stressors and strain approach. In this framework, both the occupational wellbeing of employees and organisational performance are considered; it is insufficient to be concerned with occupational wellbeing without linking it to outcomes that affect organisational performance. While the symptoms of occupational stress are the same as for stress, their consequences differ. Occupational stress frequently results in job dissatisfaction (Jackson & Schuler, 1985), reduced productivity (Braham, 1991), premature retirement (Kendell & Pearce, 1997), absenteeism (Fagin, Brown, Bartlett, Leary, & Carson, 1995; Gray-Toft & Anderson, 1985), workplace accidents (Cain, 1987), lower organisational commitment (Jamal & Baba, 2000) and work-family conflict (Voydanoff, 2002).

A number of studies have also found that occupational stress is related to impaired physical and psychological wellbeing (eg Adler & Matthews, 1994; Beehr, 1995; C. L. Cooper, Rout, & Faragher, 1989; Newbury-Birch & Kamali, 2001). While it is impossible to calculate the full personal and economic cost of each of these problems, a report produced by the Australian Government provides us with some indication of the annual cost of workplace 'psychological injuries', a classification that includes stress, depression and PTSD. The report revealed that psychological injuries make up 8 per cent of workers' compensation claims in Australian Government agencies but 29.1 per cent of total claim costs (Australian Government Comcare, 2007). In 2003–04, psychological injuries were the most costly of all the types of injury (Australian Government Comcare, 2005). The average lifetime cost of claims for psychological injuries sustained in 2005–06 for Australian Government premium-paying agencies was \$115,000, compared to \$27,000 for non-psychological claims (Australian Government Comcare, 2006).

Policing has long been recognised as a highly stressful and hazardous occupation (Alkus & Padesky, 1983; Kroes, 1985) and is ranked as among the top five most stressful occupations in the world (Dantzer, 1987). A higher rate of suicide has been found for police officers. In Australia the national average for suicides is 13.25 deaths per 100,000 population (Victorian Suicide Prevention Task Force, 1997), while the average number of Australian police suicides is 21.6 deaths per 100,000 population (Cantor, Tyman, & Slater, 1995). However, it is important to note that suicide rates for males and females differ: the male suicide rate is 21 deaths per 100,000 population and for females 5.5 deaths per 100,000 population (Victorian Suicide Prevention Task Force, 1997). The discrepancy between police suicide figures and general population averages may be due to the fact that males have been overrepresented in the Australian police service.

Occupational stressors specific to policing have been found to include unnecessary paperwork and competitiveness generated by a strict promotion system (Coman & Evans, 1991), inadequate supervisory and management practices (Davey, Obst, & Sheehan, 2001), having too much work to do, staff shortages, lack of communication, difficulties keeping up with new techniques, misuse of time by others, insufficient resources, and having to attend meetings (Brown & Campbell 1992, cited in J. M. Brown & Campbell, 1994). There is also a perception by police of public negativity directed towards them and that they enjoy less support

than other emergency services, reinforcing an 'us and them' mentality. This encourages police to do their socialising and drinking with colleagues, helping set social drinking norms that have been shown to be well above general community levels (Mann, 2006).

There have been many attempts to categorise the various stressors experienced by police. Some researchers arranged specific factors into four categories: organisational practices, the criminal justice system, the public, and the police work itself (Reese, 1986; Swanson, Territo, & Taylor, 1998; Territo & Vetter, 1981). Other studies collapsed the specific factors into two categories: organisational stressors and stressors inherent to police (Martelli, Waters, & Martelli, 1989; Swanson, et al., 1998; Violanti & Aron, 1995). Studies that categorised police stressors as being either organisational or inherent defined organisational stressors as events that were bothersome or that were precipitated by the administration. They defined inherent stressors as events that generally occurred in police work that could be harmful to the officer—for example, involving danger, violence and crime (ie danger, violence and crime; Violanti & Aron, 1994).

The influence of organisational factors on officer wellbeing has generally been perceived as peripheral and not deemed as salient to officers' psychological functioning as the operational content of policing (see Abdollahi, 2002). However, evidence has also been presented to suggest that the organisational stressors specific to policing may cause more stress than critical incidents. Hart, Headey and Wearing (1994) found that police officers considered organisational experiences—for example, management practices, career opportunities, decision-making, clarity of role, performance feedback—to be more stressful than the operational pressures of the occupation, including exposure to danger, threats and attending the aftermath of incidents with fatalities.

More recently, Hart and Cotton (2003) replicated this finding in another sample of police officers. They also found that a low level of positive affect, which they termed 'morale', was a much stronger determinant of police withdrawal behaviours (eg stress-related absenteeism and intention to submit a stress-related workers compensation claim) than was overt psychological distress. Since the evidence suggests that occupational stress can have a significant impact upon police officers' physical and mental wellbeing, it would be prudent for any study of it to also measure occupational stress, particularly in the form of burnout.

Burnout

Over the years there have been many varying definitions of burnout, but the most widely accepted is 'emotional exhaustion, depersonalisation, and reduced personal accomplishment that can occur among individuals who do "people work" of some kind' (Maslach, 1982, p. 3). According to this definition, burnout consists of three core components: emotional exhaustion, depersonalisation and (reduced) personal accomplishment. Emotional exhaustion refers to feelings of being depleted of one's emotional resources and may be linked to physical fatigue and weariness. Depersonalisation refers to a negative, cynical or excessively detached response to other people at work. Diminished personal accomplishment refers to a tendency to evaluate one's behaviour and performance negatively. This results in feelings of decline in one's competence and productivity and to a lowered sense of one's efficacy.

Previous reviews of the burnout literature (ie Burke & Richardson, 2000; Cordes & Dougherty, 1993; Moore, 2000; Schaufeli & Enzmann, 1998; Wisniewski & Gargiulo, 1997) consider the construct to be a consequence of exposure to chronic job stress. The chronic stresses that may lead to burnout include qualitative and quantitative overload, role conflict and ambiguity, lack of participation and lack of social support (Shirom, Melamed, Toker, Berliner, & Shapira, 2005).

The extensive array of burnout symptoms commonly cited in the literature—and not every individual exhibits the same symptoms—are low job performance and satisfaction, physical exhaustion/fatigue, rigidity to change, loss of flexibility, decreased communication, withdrawal, physical symptoms, apathy/ loss of concern, cynicism and emotional exhaustion (James & Gilliland, 2001). These findings suggest that job stressors are more often to be found in the job context rather than the job content (Evans & Coman, 1993).

Job-related burnout in police organisations may result in several negative outcomes, including increased turnover and absenteeism (Jackson, Schwab, & Schuler, 1986; Parker & Kulik, 1995), lower organisational

commitment (Maslach & Leiter, 1997) and the self-reported use of violence by police officers against civilians (Kop, Euwema, & Schaufeli, 1999). Burnout may also result in diminished physical and mental health (Belcastro & Hays, 1984; Burke & Greenglass, 1995; Pierce & Molloy, 1990; Seidman & Zager, 1991) and increased use of drugs and alcohol (Farber & Miller, 1981; Lowenstein, 1991; Maslach & Jackson, 1981b).

The majority of studies that examined burnout utilised the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981a), which was developed to assess the three dimensions of burnout identified by Maslach (1982): emotional exhaustion, depersonalisation and (reduced) personal accomplishment. Several studies have used the MBI to examine burnout in relation to police officers. In a sample of Canadian mounted police, Stearns and Moore (1990) found that psychological wellbeing correlated with emotional exhaustion and depersonalisation and scores on the MBI.

Health concerns also correlated highly with burnout. In another study of Canadian police (both mounted officers and regular officers) Kohan and Mazmanian (2003) found that, similar to Hart and Cotton (2003) as outlined above, burnout was more strongly related to organisational issues than operational ones. It was also found that organisational hassles had a stronger relationship with distress measures than did operational ones.

Using the MBI, Jackson and Maslach (1982) examined 142 police officers and their wives, and found that those officers experiencing burnout were more likely than those who were not experiencing burnout to report that they got angry at their wives and their children. Those with high scores on the emotional exhaustion scale were more likely to report having a drink to cope with stress and to report taking tranquillisers if they scored low on personal accomplishment. However, not all studies conducted with police officers found them to suffer from aspects of burnout. Kop and colleagues (1999) found that their sample of Dutch police officers reported a low level of emotional exhaustion, an average level of depersonalisation and a high level of personal accomplishment.

Coping

Coping refers to the cognitive and behavioural efforts one uses to manage—that is, reduce, minimise, master, or tolerate—the internal and external demands of a stressful situation (Lazarus & Folkman, 1984). The way in which someone appraises an event will have a powerful influence on their level of stress reactions (Lazarus & Folkman, 1984). It is the use of coping mechanisms, however, that account for the major differences in outcome (Roskies & Lazarus, 1979) and that influence a person's subsequent appraisal of a transaction (Lazarus, 1990).

According to Lazarus and Folkman (1984), people use both primary and secondary cognitive appraisals to evaluate adverse events. Primary appraisal involves evaluating the threat represented by the event, while secondary appraisal involves assessing one's ability to cope with the threat. Subsequently, the individual evaluates his or her coping responses for their effectiveness in reducing or removing the threat. Lazarus and Folkman (1984) consider that there are two primary functions of coping: dealing with the problem that is causing the distress—'problem-focused coping'—and regulating the emotional reaction caused by the situation—'emotion-focused coping'. Problem-focused coping involves activities that focus on directly changing elements of the stressful situation—for example, focusing on the task at hand, goal-setting, information gathering, and problem-solving. Emotion-focused coping involves techniques to modify one's internal reactions to the stressful situation—for example, distancing, denial, seeking social support, self-control, accepting responsibility and positive reappraisal.

Research has shown that people use both forms of coping in almost every type of stressful encounter (eg Folkman & Lazarus, 1988). In several studies of trauma, however, victims' greater use of emotion-focused coping, such as avoidance and distancing strategies, and lesser use of problem-focused coping directly after the event have been consistently associated with greater levels of posttraumatic symptomatology (eg Morgan & Matthews, 1995; Norvell, Cornell, & Limacher, 1993; Solomon, Avitzur, & Mikulincer, 1990; Weisenberg, Schwarzwald, Waysman, Solomon, & Klingman, 1993).

Emergency services personnel frequently have to cope with a wide range of work-related traumatic events. A number of studies have been conducted to identify which coping techniques are most commonly used by people in these professions, and which techniques are most helpful. In a study of the stress-coping strategies used by Australian police personnel, Evans, Coman, Stanley and Burrows (1993) found that officers typically use problem-focused coping strategies. Likewise, in an investigation of coping strategies used by Scottish police officers, Biggam and colleagues (1997) found a preference for problem-focused strategies.

A study by Patterson (2003), however, examined the effect of coping on the degree of psychological distress in American police officers who had been involved in stressful events. He found that greater use of problem-focused coping resulted in a 'reverse buffering' effect, or higher levels of distress, and that greater use of emotion-focused coping resulted in a buffering effect, or lower levels of distress.

In accordance with this finding, a study of the coping techniques of Israeli bus commuters facing the threat of terrorism found that those who used problem-focused coping more than denial or emotion-focused coping were more likely to suffer anxiety about terrorism (Gidron, Gal, & Zahavi, 1999). Thus, although police officers appear to prefer problem-focused coping, the evidence suggests it may not be the most effective strategy for this population in reducing psychological distress in the longer term.

In an alternative to Lazarus and Folkman's (1984) theory of coping, Suls and Fletcher (1985) conceptualise coping as comprising the two dimensions 'approach coping' and 'avoidance coping'. Approach coping refers to the use of strategies that focus on both the source of the stress and reactions to it, with the individual dealing directly with the event. Avoidance coping refers to the use of strategies that place focus away from both the source of the stress and the reactions to it, with the individual avoiding dealing with the event by not facing reality and disrupting the coping process. Avoidance coping has repeatedly been found to be associated with posttraumatic symptomatology; people who employ more avoidance strategies are likely to be more symptomatic than those who use more active forms of coping (eg Sutker, et al., 1995; Wolfe, Keane, Kaloupek, Mora, & Wine, 1993).

As with the emotion-focused / problem-focused coping literature, a number of avoidance-approach coping empirical studies have been conducted using cancer patients. For example, Friedman and colleagues (1992) noted that women with breast cancer who exhibited a fighting spirit (viewed as active coping) adjusted more positively to their illness, whereas women who used avoidance coping did not adjust so well. Similarly, in a study of women diagnosed with breast cancer, Holland and Holahan (2003) found that avoidance coping strategies were negatively related to psychological wellbeing, while approach coping strategies were related to positive adjustment.

Furthermore, in a study by Carver and colleagues (1993) of women diagnosed with breast cancer, the following three coping responses were found to reduce the woman's level of distress: acceptance, which was consistently linked to low levels of distress and was also a prospective predictor of low distress post-surgery; denial, which was consistently related to high levels of distress; and behavioural disengagement (thoughts of giving up), which was also consistently related to high levels of distress.

Approach-avoidance coping strategies have also been examined in relation to emergency services personnel. In a survey of police officers who had been involved in the LA riots, 17 per cent of officers who reported posttraumatic symptomatology were found to be almost twice as likely to use avoidance coping strategies as those without symptoms (Harvey-Lintz & Tidwell, 1997). Those making more use of cognitive avoidance, acceptance or resignation, and emotional discharge had greater levels of PTSD symptomatology, while those seeking support/information and alternative awards, such as exercise, had lower levels of PTSD symptomatology.

The finding of a link between seeking alternative awards (an avoidance strategy) and lower levels of PTSD symptomatology is inconsistent with the literature. However, the authors theorise that, due to the unique circumstances that confronted Los Angeles Police Department officers at the time, this strategy may have helped them cope with a perceived ambiguous situation and thus deal with their stress.

Coping has been consistently found to mediate the relationship between optimism and psychological distress (eg Aspinwall & Taylor, 1992; Long & Sangster, 1993). For example, in a study of maternal optimism, coping, and psychological distress following an infants' hospitalisation to the Neonatal Intensive Care Unit, it was found that the relationship between optimism and psychological distress was mediated by the mothers' use of cognitive and avoidant coping strategies (McIntosh, Stern, & Ferguson, 2004). Mothers classified as optimistic employed more cognitive and fewer avoidant coping strategies, and experienced less psychological distress both during and after their infants' hospitalisation. In a well-designed prospective study, Carver and colleagues (1993) found that pessimism was associated significantly, but indirectly—through coping responses—with the experience of greater distress at each time point of the follow-up, even after controlling for initial levels of distress. Carver and colleagues (1993) also found that optimistic women who were diagnosed with breast cancer were more likely than less optimistic women to accept the reality of the situation they were facing.

A general characterisation of this body of research is that those higher in optimism tend to use more approach-focused coping strategies (overt efforts to deal directly with the stressful event) and less avoidance coping (avoidance of the stressful event). In turn, their coping strategies and positive expectations seem to promote greater psychological wellbeing (Friedman, et al., 1992). According to self-regulatory theory (Scheier & Carver, 1992), individuals who generally expect positive outcomes also expect their coping efforts to be effective. McIntosh and colleagues (2004) suggest that optimists are more likely to persist with coping behaviours such as information-seeking and cognitive reappraisal. They suggest that individuals who generally expect negative outcomes tend to avoid the stressful situation and withdraw from continued coping efforts, presuming these to be futile. Thus they decrease the likelihood of positive outcomes.

Although there is evidence to suggest that some coping strategies are more effective than others, and that an optimistic disposition may be advantageous, ultimately a person should be capable of using a wide range of coping styles in any given situation (Biggam, et al., 1997). What works in one situation may not work in another, and what works at one point in time may not at another (Norris, 2001). Rather than one type of coping response being better than another, conflicting results in the literature, as outlined above, may be explained by the fact that certain strategies suit certain situations. In order to succeed, one's coping must match the circumstances of the event and one's own resources (Shalev & Ursano, 2003). Acceptance, cognitive reframing or denial may be more appropriate in situations that are uncontrollable (eg captivity), while taking action to reduce the stressor or seeking help may be more appropriate in other circumstances (eg injury from a car accident).

Police, drugs and alcohol

It is not uncommon for those employed in a high-stress occupation, where there is little opportunity to manage stress effectively, to resort to self-defeating coping tactics. Such maladaptive tactics include self-medication through alcohol or drug use, anger, violence and social withdrawal (Amaranto, Steinberg, Castellano, & Mitchell, 2003). It is well established that there is a frequent co-occurrence of substance use disorders and PTSD (Davidson, Hughes, Blazer, & George, 1991; Kessler, et al., 1995).

Worryingly, there is strong normalisation of alcohol consumption within the police service, which is strongly predictive of both risk of alcohol dependency and negative consequences. A study of Queensland police officers by Davey, Obst and Sheehan (2001) found that 23 per cent of the sample reported being affected by co-workers' drinking in some way during the previous year, while 14 per cent reported that drinking outside work hours had affected their performance at least once in the past year. Research concerning alcohol consumption by Australian police personnel is somewhat limited.

A survey by McNeill and Wilson (1993) found that, although police officers reported drinking less frequently during a typical week than the general Australian population, on the occasions they did drink the quantities consumed were far greater than the Australian norms. 'Binge drinking' is defined by the World Health Organization, for men, as imbibing more than 10 standard drinks and, for women, as imbibing more than six standard drinks on more than two occasions per month. McNeill and Wilson (1993) found that 32 per cent of female and 16 per cent of male officers were classified as binge drinkers according to this criterion.

A study of Northern Territory police officers found that 28 per cent consumed five to eight standard drinks a day, which places them at moderate risk of alcohol dependence according to the National Health and Medical Research Council. A further 12 per cent consumed more than nine standard drinks per day, placing them at high risk of alcohol dependence (Daulby, 1991). In comparison, for the Northern Territory general population, 24 per cent of males were classified as being at high risk and 16 per cent at moderate risk. Anecdotal evidence also suggested that some of the officers surveyed regularly used benzodiazepines.

One study of New South Wales police officers found that 37 per cent of male officers consumed alcohol at levels that placed them at risk of harmful consequences (O'Brien & Reznik, 1988), while another study of New South Wales officers found that 48 per cent of policemen and 40 per cent of policewomen consumed alcohol excessively (Richmond, Wodak, Kehoe, & Heather, 1998). These figures are considerably higher than those for the general Australian population at the time: a 1998 National Drug Strategy survey of households found that approximately 11 per cent of males and 3.8 per cent of females drink excessively.

In his study of Queensland police, Rallings (2000) found that hazardous drinking rates increased from 13 per cent to 22 per cent after commencement of police work and subsequent exposure to traumatic incidents, and that smoking rates also increased from 8 per cent to 15 per cent. In a replication of this study, Rallings, Martin and Davey (2005) examined alcohol consumption in new-recruit Queensland police officers. They found a significant increase in the quantity and frequency of alcohol consumption from the time the officers were undertaking initial training to when they had completed 12 months of operational duties. The percentage of officers who drank more frequently than once a month increased from 47 per cent to 60 per cent, and the percentage of officers who reported consuming six or more drinks once a month increased from 25 per cent to 32 per cent. The number of female officers, but not male officers, who reported drinking at harmful levels increased over the 12-month period. There was also a significant increase in the number of officers who reported smoking.

The findings of these two studies suggest that working as a police officer has a direct impact upon an individual's alcohol consumption and smoking rate. Therefore, it is important that alcohol and drug use intervention and education occur when new recruits are still at the academy and before they get out into the field. Given the fact that alcohol causes reaction times to slow, and thinking and co-ordination to become sluggish, and it increases aggression, the presence of alcohol in an officer's system can greatly impact upon police work, placing both police officers and members of the public at unnecessary risk (Davey, et al., 2001).

It is not possible to review the literature relating to drug use (both licit and illicit) by police officers, because there are no published studies that have examined police drug use. However, anecdotal evidence and officer testimonies suggest that a number of police officers use both licit and illicit drugs. Very little has been written about the use of licit drugs by police officers, yet research in other industries suggests that there is a correlation between shift-work and the use of 'uppers' (stimulants to keep you awake) and 'downers' (tablets to put you to sleep). Even small amounts of medications such as antidepressants, antihistamines, benzodiazepines and analgesics can impair cognitive and behavioural functioning. The multiple use of these drugs, particularly in combination with alcohol or illicit drugs, can significantly impair performance (Fenlon, Davey, & Mann, 1997). It is generally accepted that any substance that interferes with the body's normal functioning in a negative way, such as slowing reflexes or impairing judgement, should not be condoned in our police services (Mann, 2006).

Resilience training and police

Although the bulk of resilience research has been conducted in recent years, the term 'resilience' was first used in the 1950s to describe individuals who survived stressful environments (for review see Kaplan, 1999; Masten, Best, & Garmezy, 1990). The foundation of the concept of resilience is:

... the capacity of a given system to implement early, effective adjustment processes to alleviate strain imposed by exposure to stress, thus efficiently restoring homeostatic balance or adaptive functioning within a given psychological domain following a temporary perturbation therein (Layne, et al., 2007, p. 500).

Following this definition, an individual may experience resilience in one life domain (eg maintaining healthy family relationships following involvement in a police shooting) but not in another (eg maintaining workplace functioning; Layne, et al., 2007).

A key point is that, although resilient individuals may experience some short-term dysregulation and variability in their emotional wellbeing (Carver, 1998), their reactions to a traumatic event tend to be relatively brief and do not impede their functioning to a significant degree. Therefore, one would expect resilient individuals in a trauma-exposed population to report few or no psychological symptoms, to continue fulfilling their personal and social responsibilities and to be able to embrace new tasks and experiences (Westphal, Bonanno, & Bartone, 2008).

Recently, researchers have become increasingly interested in the concept of resilience in regard to posttraumatic stress symptomatology. However, as noted by Bonanno, Rennieke and Dekel (2005), there have been few attempts in the trauma literature to distinguish subgroups within the broad category of individuals who are exposed to a traumatic incident but who do not go on to develop PTSD. Most studies of resilience have focused on children; fewer studies examine resilience among adults. Many of these studies have been efforts to understand how children growing up in adverse circumstances successfully avert later psychiatric disorder (Elder, 1986; Smith, Smoll, & Ptacek, 1990; Werner, 1990; Zoccolillo, Pickles, Quinton, & Rutter, 1992).

In one of the very few studies to examine resilience in adults, Manhattan residents were randomly surveyed by phone following the September 11 terrorist attack (Bonanno, Galea, Bucciarelli, & Vlahov, 2006). Mild to moderate PTSD was defined as two or more PTSD symptoms, and resilience as one or no PTSD symptoms in the first six months after the attack. More than 65 per cent of the residents were classified as being resilient. Resilient outcomes have also been documented in studies that utilised structured clinical interviews and anonymous ratings from participants' friends or relatives (eg Bonanno, Moskowitz, Papa, & Folkman, 2005; Bonanno, Rennieke, et al., 2005).

In contrast to childhood resilience, which is identified in situations where typically a child has been exposed to an abusive or poverty-stricken environment over a long period, resilience in adults typically occurs as the result of an isolated and usually brief traumatic event (Bonanno, 2005). When this happens, rather than adapting long-term coping strategies, the individual instead utilises pragmatic forms of coping, which are often less effective or maladaptive in other contexts. For example, in an examination of individuals exposed to a traumatic event Bonanno, Field, Kovacevic and Kaltman (2002) found trait self-enhancement (ie overestimating one's own positive qualities) to be positively associated with ratings of functioning made by mental health experts. Those high in self-enhancement tend, however, to be regarded as narcissistic, and people who were rated (by untrained observers) as high in self-enhancement were also rated as being high on negative traits such as 'self-centredness'.

Furthermore, in a study of high-exposure survivors of the World Trade Center attack, it was found that trait self-enhancement was more prevalent among those who exhibited a resilient trajectory, defined as good levels of mental and physical health, through either self-report or ratings by family and friends (Bonanno, Rennieke, et al., 2005). However, self-enhancers' friends and family rated them as decreasing in social adjustment and honesty, while the self-enhancers themselves rated their social relationships more positively than non self-enhancers. Analysis revealed that this positive rating by the self-enhancers fully mediated their low levels of PTSD symptomatology. Bonanno, Rennieke and Dekel (2005) suggest that this indicates self-enhancers to be completely unaware of the negative reaction they can cause in others, while their self-serving bias plays an important role in maintaining healthy, stable levels of functioning.

Resilience is a construct that has received increased attention in recent years. However, theories that explain the method in which resilience interacts with the perception and processing of, and adaptation to, traumatic events are yet to be developed. As it has been detailed in this section, resilience has been conceptualised in a number of different ways that are often dependent on the context in which it is being measured.

Some researchers have chosen to define resilience as the absence of PTSD symptoms following exposure to a potentially traumatic event (eg Resnick, Galea, Kilpatrick, & Vlahov, 2004). Other researchers argue that

the absence of PTSD symptoms does not equate to resilience any more than the absence of disease equals health (see Almedom & Glandon, 2007). In a study by Bonanno, Rennie and Dekel (2005) resilience was defined as 'good levels of mental and physical health'. This type of holistic approach to resilience will be utilised for the current study.

Preventing stress reactions

The intensity of stress reactions, and the ability to cope emotionally with a traumatic or stressful event, can be influenced by the extent to which an individual is prepared for the experience (Paton, 1994). Lack of preparation, suddenness of onset, unrealistic expectations and a tendency to deny or suppress feelings can heighten the subjective experience of loss of control and make the process of re-establishing control more difficult (Eränen & Liebkind, 1993). Under these conditions, when faced with events that threaten psychological integrity, individuals become unable to draw on their previous learning, training or experience to guide their response or to appreciate their reactions, which increases their vulnerability to traumatic stress reactions (Pollock, Paton, Smith, & Violanti, 2003).

In the case of PTSD it has been established that the severity of symptoms experienced by an individual is associated with uncontrollability and unpredictability (Foa, et al., 1989). One important aspect of pre-incident preparation is the provision of information. Many traumatic experiences result from a violation of expectancy, so setting realistic expectations serves to protect against violated assumptions (Foa & Kozak, 1986).

Mastery of a situation refers to one's perception of an event as being under control, which in turn reduces the deleterious effects of the resulting stress (Mandler, 1982). Janis (1982) argues that the most promising approach to intervening in and countering the disruptive consequences of stress resulting from an incident is to provide individuals with vivid information about what they are likely to experience during and after a stressful incident while they develop skills and strategies for coping. Resilience training may be looked at as a way of increasing an individual's ability to respond to a variety of situations with greater flexibility (Byatt, 1997; Garrison, 1991).

Within the stress management literature, attention has been directed at resilience training as a way of providing individuals with the necessary skills to deal with a stressful event (Meichenbaum, 1974). This process is analogous to a medical immunisation, whereby a relatively small, controlled amount of stress is applied to increase clients' resistance. Techniques such as imagery and behavioural rehearsal, role play, modelling and graded in vivo exposure are used to create stressors.

Stress Inoculation Training (SIT), developed by Cameron and Meichenbaum (1982), teaches self-understanding and general coping skills that can be used to prepare people for conditions of high stress. Using the theoretical framework of SIT, Keyes and Dean (1988) successfully developed a program to reduce and prevent maladaptive stress in individuals who worked in direct contact with mentally retarded clients at three residential facilities. After the training, the SIT group had significantly lower scores on an anger inventory and used emergency restraint less frequently than those that did not receive SIT training. However, it should be borne in mind that, rather than being preventive, this was a reactive treatment in practice.

Using the same SIT program used in Keyes and Dean (1988), Keyes (1989) once again trained staff working in direct contact with mentally retarded clients at a residential facility. During the 12-month training period, 28 cases of suspected abuse by staff members were reported. In the 12 months following the training, this dropped to 15 cases. In addition, during the 12 months before SIT training, a direct-contact staff turnover rate of 60 per cent was reported. In the 12 months following SIT a direct-contact staff turnover rate of 35 per cent was reported. These results suggest that SIT may be successful in reducing intrapersonal stress.

Sarason, Johnson, Berberich and Siegel (1979) developed a stress management program for police academy trainees, based heavily upon the early work of Meichenbaum (1973, 1975). The program was designed to make trainees aware of their cognitive and physiological responses to anger-provoking and threatening situations. Academy personnel rated the trainees that received the stress management training as performing

at a superior level in several simulated police activities compared to trainees who did not receive the training. These results, however, must be treated with caution as the observers were not independent and there were only nine participants in each of the two conditions.

An interesting finding was made regarding the effect of preparedness for people involved in a traumatic incident—in a piece of research that was not specifically designed to measure this outcome. In a study of the psychological impact of performing body recovery duties after the Piper Alpha oil rig disaster, Alexander and Wells (1991) concluded that preparing police officers for body recovery work, advising them of the personal, emotional and psychological reactions the work was likely to elicit, and emphasising the importance of their work for surviving families, contributed to increasing stress resilience. Compared to matched normal controls, the group failed to exhibit any increase in psychiatric morbidity. However, because it was not possible to isolate the effects of preparation from other managerial and support interventions, the specific contribution of training can only be inferred (Bartone, 2003).

Paton (1994) compared the experiences of a group of volunteer disaster workers who had received training designed to increase their ability to impose coherence and meaning on disaster experiences with a group of firefighters who had received no special training for working in a disaster situation. Training included increasing awareness of the emotional and psychological consequences of disaster work, creating realistic performance expectations and increasing awareness of the nature of disaster operating environments. It was found that the volunteers were better equipped to deal with the situation and that the firefighters were more likely to perceive event demands and characteristics as stressors and to report posttraumatic symptoms more frequently and at greater intensity. These results should be treated with caution, however, due to the fact that volunteer disaster workers were compared to career firefighters, so two different populations were compared.

In another study with police, Backman, Arnetz, Levin and Lublin (1997) provided police academy trainees with mental imaging training. This training comprised instruction in stress theory; being taught physical and mental relaxation; learning about problem management, setting goals, triggers and self-image; and practical training. Trainees who received training were found to experience their daily situation more positively than trainees who did not receive the training. The training group also reported better health, experiencing fewer intestinal and sleep problems.

In one of the earliest studies of its kind, Clarke and colleagues (1995) conducted an RCT of targeted cognitive-behavioural intervention to prevent depressive disorders in adolescents. The targeted aspect of the intervention was that adolescents at an elevated risk of depression were selected to participate. It was found that the intervention significantly prevented depressive disorders at one-year follow-up. Self-reported depressive symptoms were significantly reduced post intervention, but not over the follow-up period. There was also no reduction in clinician-rated depressive symptoms.

Similarly, Peden, Rayens, Hall and Beebe (2001) found that a brief targeted cognitive-behavioural group intervention significantly prevented depressive symptoms in female college students who were at risk of depression. More recently, Bearman, Stice and Chase (2003) applied a brief targeted cognitive-behavioural group intervention to women identified as being at risk of depression and bulimia. There was a reduction in depressive symptoms at three-month follow-up, but the effect faded at six-months.

In a similar study, Clarke and colleagues (2001) used a brief targeted intervention with adolescents at high risk of depression (the adolescents' parents were all treated for clinical depression). A significant preventive effect was found for both self-reported depressive symptoms and clinician-rated major depressive symptoms at one-year follow-up. However, at two-year follow-up the preventive effects had faded. In another study that followed participants over two years, Gillham, Hamilton, Freres, Patton and Gallop (2006) delivered a cognitive-behavioural prevention program to 11- and 12-year-old children. The intervention produced a significant preventive effect for children who had high symptoms at intake.

Significant prevention of depression was also found in a study by Seligman, Schulman, DeRubeis and Hollon (1999) following the use of a targeted cognitive-behavioural intervention. In a sample of college students it was found that the intervention group had significantly fewer moderate depressive episodes through three years of follow-up, although there was no preventive effect for severe depressive episodes. They also found

that there were fewer episodes of moderate generalised anxiety disorder in the intervention group compared to the control group. Both severe depressive episodes and moderate generalised anxiety disorder episodes were few in the college sample.

In a replication and extension of this work, Seligman, Schulman and Tryon (2007) delivered a targeted cognitive-behavioural intervention program to college students at risk of depression. For this second study, the classroom workshop that was delivered to the intervention group was supplemented with web-based materials and email coaching. It was found that those in the intervention group had significantly fewer depressive and anxiety symptoms than those in the control group immediately after the intervention, but there was no significant difference between the conditions at six-month follow-up.

Study rationale

As previously noted, police officers are at increased risk of being exposed to traumatic incidents and going on to develop PTSD compared to the general population. It has been established that the severity of PTSD experienced by an individual is associated with uncontrollability and unpredictability. Although many risks faced by police officers have been acknowledged and accepted, no evidence-based program exists that is designed to prepare police officers for the psychological reactions they may experience on encountering a traumatic situation.

Currently, the only assistance available to officers is in the form of psychological debriefing (which has been found to have noxious properties with civilian populations), counselling and peer support, each of which is offered after a traumatic event. One important aspect of pre-incident preparation is the provision of information. As noted above, many traumatic experiences result from a violation of expectancy, so setting realistic expectations serves to protect against violated assumptions.

It has been suggested that training programs should be based on an all-hazards approach and designed to facilitate both technical and psychological preparedness and the development of a flexible and adaptable response capability (Driskell & Salas, 1996; Paton, 1994). Training to promote stress resilience should address the need to enhance the capability of workers to render atypical operational events coherent and to understand and manage the psychological impact of emotionally distressing events on themselves and others (Pollock, et al., 2003).

Being involved in a previous traumatic incident does not necessarily prepare a person for dealing with a similar incident in the future. In fact, if the person has not emotionally and cognitively processed the initial incident, they may be more susceptible to future traumatic incidents (Williams, 1987). This suggests that experience alone, left to chance, is insufficient to prepare officers to deal with the future effects of a critical incident, and may allow officers to pick up inappropriate strategies that will leave them ill-prepared to act or recover and without the requisite variety of appropriate behavioural responses (Garrison, 1991).

Only a small number of studies have assessed the utility of resilience training using emergency worker populations—for example, Sarason, Johnson, Berberich and Siegel (1979); Paton (1994); and Backman, Arnetz, Levin and Lublin (1997). Although a small number of RCTs have indicated that resilience training is able to prevent depression and symptoms of anxiety, an RCT of the efficacy of resilience training for ameliorating stress reactions has not yet been conducted. A few studies have used resilience training with the aim of preventing stress reactions, but they did not utilise robust, scientific designs. In order to address this deficit in the literature, the primary aim of this study was to conduct a RCT of resilience training for the prevention of stress reactions.

As previously noted, research examining alcohol consumption by police has been limited, and there has been a complete lack of research examining drug use by police. The three key aims of this study were therefore (a) to assess the use of licit and illicit drugs by police officers, (b) to assess the use of alcohol by police officers and (c) to assess the efficacy of resilience training in reducing the use of drugs and alcohol by police officers.

Chapter 2: Development of the resilience training program

This study involved the development of a resilience training program as well as the formulation of trainer manuals and participant handbooks. This process involved a number of systematic steps, which are outlined below.

Review of the literature

Given the relative absence of resilience training programs, the resilience program that was developed was based upon the theories and the types of skills and techniques suggested in the literature to be possibly useful in preparing an individual for a stressful situation. A link was then made of how these theories, skills and techniques could be extrapolated to develop personal resilience training modules (refer to Table 3.1 below).

For instance, cognitive behavioural therapy (CBT) is one of the most successful treatment methods for people diagnosed with PTSD. A commonly used CBT exercise is to teach people Beck's (1964) model (the connection between events, thoughts, moods and behaviours) and to teach them to identify these connections through the use of ABC sheets (Beck & Emery, 1985; Resick & Schnicke, 1993). Exercises of this type were then selected for inclusion in the current program, following the hypothesis that they would develop adaptive thinking patterns and hence enhance resilience (Table 3.1 presented below outlines the exercises incorporated in the resilience training program).

Further design elements that were specific to this program were as follows: a psycho-educational training approach to resilience and stress; face-to-face training groups rather than individual sessions; skills training in the form of group interaction and shared experiences; and provision of handbooks containing all the course materials to enable practice of learnt skills.

Table 3.1: Exercises included in the resilience training program

Exercise to be included in training program	Rationale	References
a) Viewing graphic photographs and videos of murder scenes or car accident scenes b) A talk-through by an experienced, well-respected officer on the emotional impact of each scene	Serial approximation / desensitisation	Barlow (1988); Heimberg & Barlow (1988); Foa & Kozac (1986); Kozak et al. (1988); Rabavilas, et al. (1976); Steketee, et al. (1989)
Thought-challenging questions	Enables negative thoughts to be challenged and replaced with rational ones	Foa & Rothbaum (1998)
The 'ABC' worksheet. Participants are taught to identify: the A ctivating event; the negative thought or B elief; the C onsequences of the thought or belief	Teaches individuals to make connections between events, thoughts, moods and behaviours. Teaches them to consider threats as problems to be solved and to identify which aspects of both the situation and their own reaction are amenable to change.	Beck (1964); Beck & Emery (1985); Resick & Schnicke (1993)
Guided self-dialogue	Involves teaching statements that a stressed or anxious person can say to themselves when preparing for, confronting or handling a stressful event	Keyes (1995); Meichenbaum (1975); Neck, Steward, & Manz (1995)
Calm breathing exercise	Involves teaching participants a controlled breathing exercise (also known as diaphragmatic breathing), which has been shown to be an effective way of reducing anxiety	Bonn, Readhead & Timmons (1984); Clark, Salkovskis & Chalkley (1985); Rapee,(1985); Salkovskis, Jones & Clark (1986)
Muscle relaxation	The Jacobsonian (1938) deep muscle relaxation technique has been shown to reduce anxiety and can be used to stop individuals from fainting when seeing blood and injury.	Jacobson (1938); Luebbert, Dahme, & Hasenbring (2001)
How to recognise problem drinking worksheet	Educates participants about the dangers of alcohol and increases self-awareness	National Health and Medical Research Council (2001)

Structure of the resilience training program sessions

Resilience training program

The next stage in the development of the training was to identify how to structure and present the program to the police officers. It was decided that the first session should present a program overview of the resilience training and also introduce the officers to the types of unpleasant situations and experiences they may encounter as part of their job. These images and videos were presented by a well-respected member of either the Homicide unit or the Major Collisions unit, who also discussed the feelings and emotions that are associated with such scenes. It was important that these images be shown in a supportive environment, and that officers were told at this time about the coping strategies that can be used in difficult times, as well as the different professional help services available to them.

In Session 1 of the resilience training, *Policing expectations*, included the modules: (1) Introduction, (2) Policing expectations and serial approximation/desensitisation, (3) Physical responses to trauma, (5) Social support, and (7) Help services available.

In Session 2, *Coping skills*, the recruits were taught skills for coping with stressful, traumatic or upsetting events. This session presented the material of Module (4): Thought-challenging, cognitive re-structuring and guided self-dialogue.

For Session 3, *Coroner's Court*, the researcher accompanied the recruits on a field trip to the Coroner's Court and the morgue. Here the recruits were shown two bodies: one pre autopsy and one post autopsy. At this session there are usually one or two people in every group of 20 who either faint or leave the room because they are overcome with physical symptoms. It was therefore decided that this would be an opportune occasion to teach the recruits methods for dealing with the physical symptoms of anxiety.

On the trip to the morgue, the recruits were taught the controlled breathing and the muscle relaxation/tension exercises upon arrival at the location. Muscle relaxation/tension was used to compete with a vaso-vagal syncope that can occur when people are exposed to blood, injury or death and results in fainting. Just before entering the viewing area at the morgue, the recruits were once again reminded to use the exercises that they had been taught less than an hour earlier. These exercises were drawn from Module (3): Physical responses to trauma.

Session 4, *Drugs and alcohol*, taught the recruits about the dangers of excessive alcohol use and drug use. The recruits were provided with information and statistics specific to policing. They were also taught how to recognise if they or someone else, such as a colleague, had a drinking problem and were given contact numbers of professional help organisations. The session covered the content of Module (6): Drugs and alcohol.

Session 5 of the program re-capped all of the information that had been taught in the previous four sessions. The information was all tied together to form a cohesive program, and the recruits were given another opportunity to ask questions about any elements they were unsure of. A booklet summarising the material was also provided to the recruits. This session covered the material in Module (8): Conclusion.

The training program formed part of the academy syllabus, and all of the material was potentially examinable. The recruits were informed that they would be examined on the training content.

Control training program

The non-treatment control program was designed to account for any observable effects in the resilience condition being due to recruits having a number of sessions with a trainer and spending time together as a group. The non-treatment sessions were designed to be interesting and of some relevance but were not intended to specifically improve resilience in new-recruit officers.

In Session 1 of the control training program, *Critical incidents*, the recruits were shown the same photographs of critical incidents used in resilience training Session 1. However, those in the control condition were taught about such scenes from an operational perspective, learning how to preserve evidence and the crime scene and also how to deal with the victim's family and friends. They did not receive any information on the type of emotional impact these events might have and were not given education or information about coping strategies for such incidents.

The content of the following training modules was included in this session: (1) Introduction, (2) Critical incidents, (3) Preserving evidence and the crime scene, (4) Role of clinical services and (5) Dealing with the victim's family and friends.

The fact that the control condition group was shown crime scene photographs is a significant limitation of the current study. Unfortunately, this situation was unavoidable, as the academy's course administrators felt that it would not be possible for half of the squads to attend a presentation of crime scene photographs given by a well-respected guest lecturer while half did not. It was felt that cross-contamination would occur, with those who received the talk giving those who did not receive the talk detailed accounts of what was discussed, and it was also considered that a number of complaints would be filed by officers who did not receive the guest lecturer's talk. It was therefore decided that the best solution was for the guest lecturer to give talks to both groups but present an alternative session to the control group.

For Session 2 of the control training, *Sexual offenders*, a talk on sexual offenders was delivered. The focus of this talk was to dispel some of the myths surrounding sexual offending, and topics such as different types

of offenders (male vs female; adult vs adolescent; preferential vs situational), offending rates, rehabilitation potential and recidivism rates were discussed. This session covered the content of Module (6): Sexual offenders.

In Session 3, *Victims of crime*, the recruits received a presentation designed to give them an understanding of the experience a person goes through when they become a victim of crime and informed them about the thoughts and feelings a victim may have. It also taught them about the importance of being empathetic and understanding with victims, and that being subjective is the number one predictor of who will and who will not do well after being victimised. The recruits were also given a copy of *The Victims' Charter (Victims' Charter Act, 2006)*, which they were taken through point by point to ensure they were made aware of the principles criminal justice agencies must follow when dealing with victims. The content of Module 7 was covered in this session.

Session 4, *Conclusion*, recapped the material presented in the previous three sessions. Recruits were given a final opportunity to ask any questions they may have had. The content of Module 8 was covered in this session. The training program formed part of the academy syllabus, and all of the material was potentially examinable. The recruits were informed that they would be examined on the training content.

The training modules were delivered in five sessions for the resilience condition and four sessions for the control condition. Table 3.2 shows the sessions and the modules covered during each session.

	Resilience condition		Control condition	
	Name of session (duration)	Module	Name of session (duration)	Module
Session 1	<i>Policing expectations</i> (3 hrs)	Introduction Policing expectation and serial approximation/ desensitisation Physical responses to trauma Social support; help services available	<i>Critical incidents</i> (3 hrs)	Introduction Types of critical incidents that may be attended Preserving evidence and the crime scene The role of clinical services Dealing with the victim's family and friends
Session 2	<i>Coping skills</i> (30 mins)	Thought-challenging, cognitive restructuring and guided self-dialogue	<i>Sexual offenders</i> (30 mins)	Sexual offenders
Session 3	<i>Coroner's Court</i> (10 mins)	Physical responses to trauma	No session	No session
Session 4	<i>Drugs and alcohol</i> (30 mins)	Drugs and alcohol	<i>Victims of crime</i> (30 mins)	Victims of crime
Session 5	<i>Summary</i> (40 mins)	Conclusion	<i>Summary</i> (40 mins)	Conclusion

For each session of the program the recruits were given a worksheet to fill in on the content of the session. This served two purposes: (a) to help the recruits retain the information presented through the process of writing it down; and (b) to provide material for recruits to refer to at a later date and to study for the upcoming exam.

In the final training session, recruits in the resilience training condition were given the *Police resilience* handbook, which contained all of the information presented during the resilience training program. Those in the control condition group were given the *Strengthening police resilience* handbook, which contained all of the information presented during the control training program. Handbooks were not given out until the final session, so that the recruits would not read ahead and use the examples provided, rather than their own examples, during the group discussions.

Three months after the recruits finished their training and graduated from the academy, they were sent a second copy of their respective handbooks. This second copy was to act as a 'booster' to refresh recruits' memory of what they were taught as part of their training program and to serve as a reminder of it once they left the academy.

Manuals and handbooks

The final stage of the development of the resilience training program was to write up the trainer and new-recruit manuals so that the program would be standardised across groups. The trainer manual included copies of all presentations, exercises and worksheets, as well as the theoretical justifications for the use of each of the training components. The trainer manual was divided into two sections: Part 1, the resilience training program and Part 2, the control training program.

Chapter 3: Method and materials for evaluating the resilience training program

Participants

The study sample comprised 285 new-recruit Victoria Police officers. Four of these officers only completed pre-program and 12-month follow-up assessments and were therefore excluded from the primary analyses. This left 281 participants in the main study sample of officers who completed pre-program and six-month follow-up assessments (144 male, 137 female), aged between 19 and 60 years of age ($M=28.4$, $SD=7.0$). Of the 285 participants a subgroup of 92 completed a 12-month follow-up assessment (42 male, 50 female). Participants were required to have the potential, by virtue of their work, to be exposed to a critical incident of sufficient seriousness to meet DSM-IV criterion A for PTSD. The study utilised a stratified longitudinal design with a convenience sample. The sample was considered convenient due to the fact that only police officers were selected to take part.

Approvals

A university human research ethics committee approved the protocol, as did the Victoria Police Research Coordinating Committee.

Consent forms and information sheet

New-recruit Victoria Police officers were informed about the research study in a separate session conducted the week before the recruits were due to begin the resilience or control training program. At this time the recruits were verbally informed about the research project, given an information sheet to read and keep for future reference, and given an opportunity to ask questions about the research project.

Due to the nature of the training that police receive, recruits were not able to 'opt out' of receiving either the resilience or control training. Logistically, it was not possible for a few members to be removed from the class. However, participants were informed that they had three options in regard to the psychological questionnaires. They could elect to (a) participate in the study and fill in the questionnaires, (b) fill in the questionnaires but have the researchers destroy them later on, thus hiding from their colleagues that they did not wish to take part or (c) not fill in the questionnaires. Option (b) was provided to negate possible peer group pressure by allowing recruits to anonymously elect to not have their information included in the study. Having received this information, participants completed and signed the consent form.

Recruitment and condition allocation

Before joining the police service, all participants underwent a medical examination to screen out chronic diseases and current mental disorders (including PTSD), use of medication and drug or alcohol abuse, as well as a psychological assessment to screen for psychopathology. All participants had undergone this screen just a few months before entering the study, which means that anyone with a major pre-existing medical or psychological disorder would have been screened out by Victoria Police before commencement of the research study. Such procedures lead to a 'healthy worker effect' (eg Li & Sung, 1999).

Eighteen police academy squads of 20 recruits participated in the study. Nine squads received the resilience training program, and nine squads received the control training program. Using a stratified randomisation process, squads were assigned to receive one of the two types of training. Recruits, therefore, received resilience training or control training by virtue of which squad they were in.

Upon applying to enter the Victorian Police Academy, recruits completed a series of tests and then received an overall ranking score. Admission to the academy was based on vacancy rates, recruitment intake schedules, and applicants' overall ranking score. In this way recruits were randomly allocated to a squad. Squads were then stratified using proportional stratified sampling, with three to four squads allocated to each stratum. Stratified sampling was used to avoid cross-pollination between the two conditions. The aim was for participants in each of the two conditions to remain blind to which condition they were in. By reducing the opportunities for those in the different conditions to communicate with one another, the chance of discovering which condition they had been allocated to was limited. This was due to the fact that at any one time only approximately four different squads were receiving training at the academy. As far as most recruits were aware, they were receiving the same training as everyone else since most people at the academy at any one time were receiving the same training.

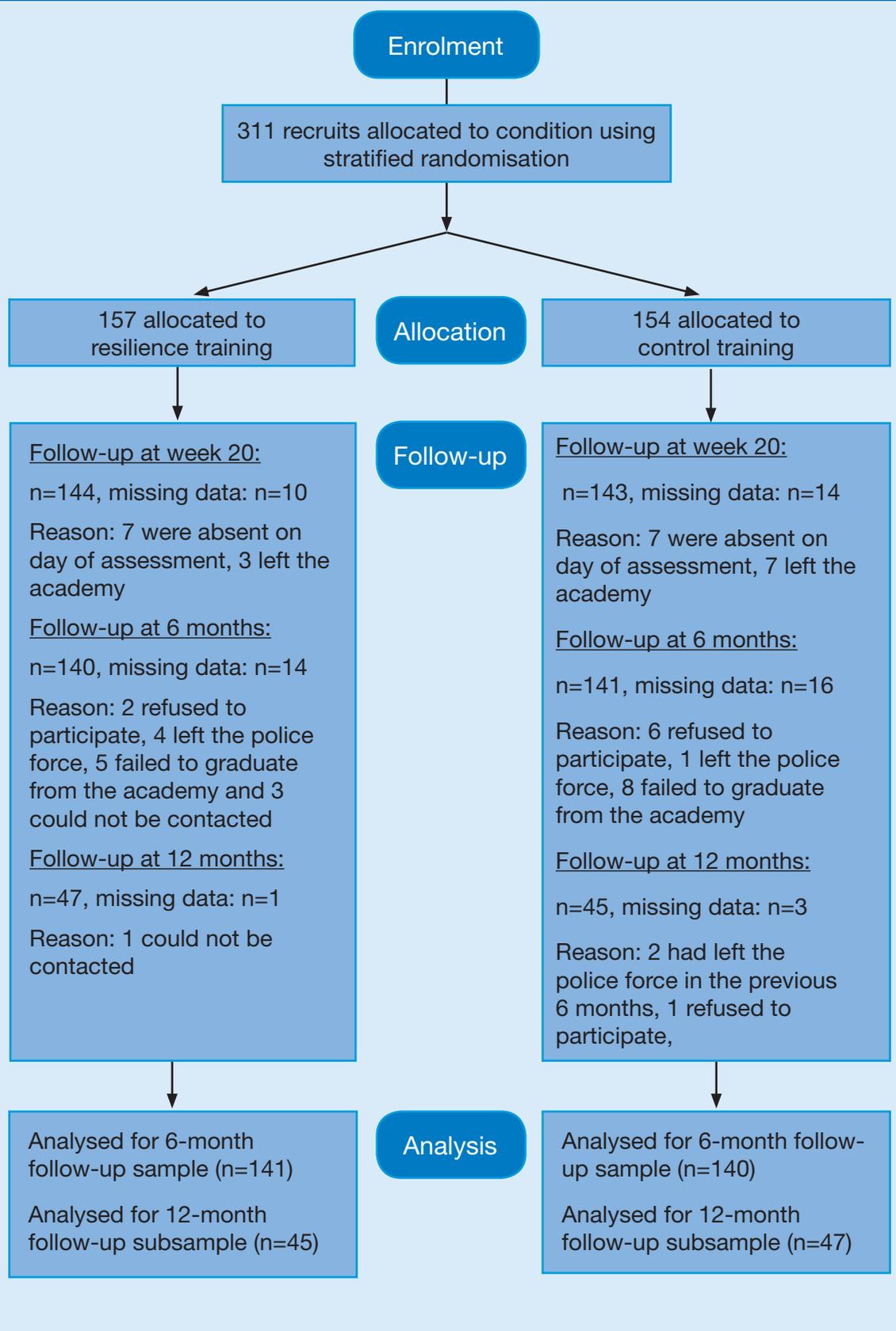
Three hundred and eleven people consented to participate in the study and were then allocated to one of the two conditions. Of these, 10 left the police academy and failed to complete the training, leaving a sample of 301. At the post-training assessment, 14 new recruits were absent on the day of data collection. This meant that 287 new recruits completed the post-training assessment (at this time point, no new recruits refused to participate).

At six-month follow-up eight people refused to continue participating in the study, five began work as a police officer but then later quit the police force (so their follow-up data was not collected), 13 failed to graduate from the police academy and three could not be contacted. This left a final sample of 281 participants.

Twelve-month follow-up data was also collected for a smaller subgroup comprising recruits from the first six squads to participate in the study. In the stratification process three of these squads had been allocated to receive the resilience training and three to receive the control training. Ninety-six officers who had completed the pre-training assessment were eligible to complete the 12-month follow-up assessment. Of these, 92 new recruits completed the assessment, two had left the police force in the previous six months, one could not be contacted and one refused to participate. The 12-month data will be treated separately from data on the main body of recruits who completed to six-month follow-up. Further data collection at this time point was not possible, but we hope to conduct a further, full-sample, five-year follow-up.

One hundred and forty individuals (76 male, 64 female) aged between 19 and 60 years ($M=28.8$, $SD=7.3$) were allocated to the control condition, with an average of 15.6 participants per squad (range: 12–21). In the resilience condition there were 141 individuals (68 male, 73 female) aged between 19 and 50 years ($M=28.0$, $SD=6.7$), with an average of 15.7 participants per squad (range: 11–20). Those who dropped out after the pre-program assessment were compared to the final sample for a number of key variables. This was to check that those who dropped out were representative of the final sample and had not dropped out due to pre-existing factors such as high levels of depression. No significant differences were found between those who dropped out after the pre-program assessment and the final sample for any of the key variables (depression, stress, anxiety, alcohol use, drug use, social support, relationship satisfaction or general health). A flow diagram of participant numbers for each of the assessment times is shown in Figure 4.1.

Figure 4.1: Diagram showing the flow of participants through each stage



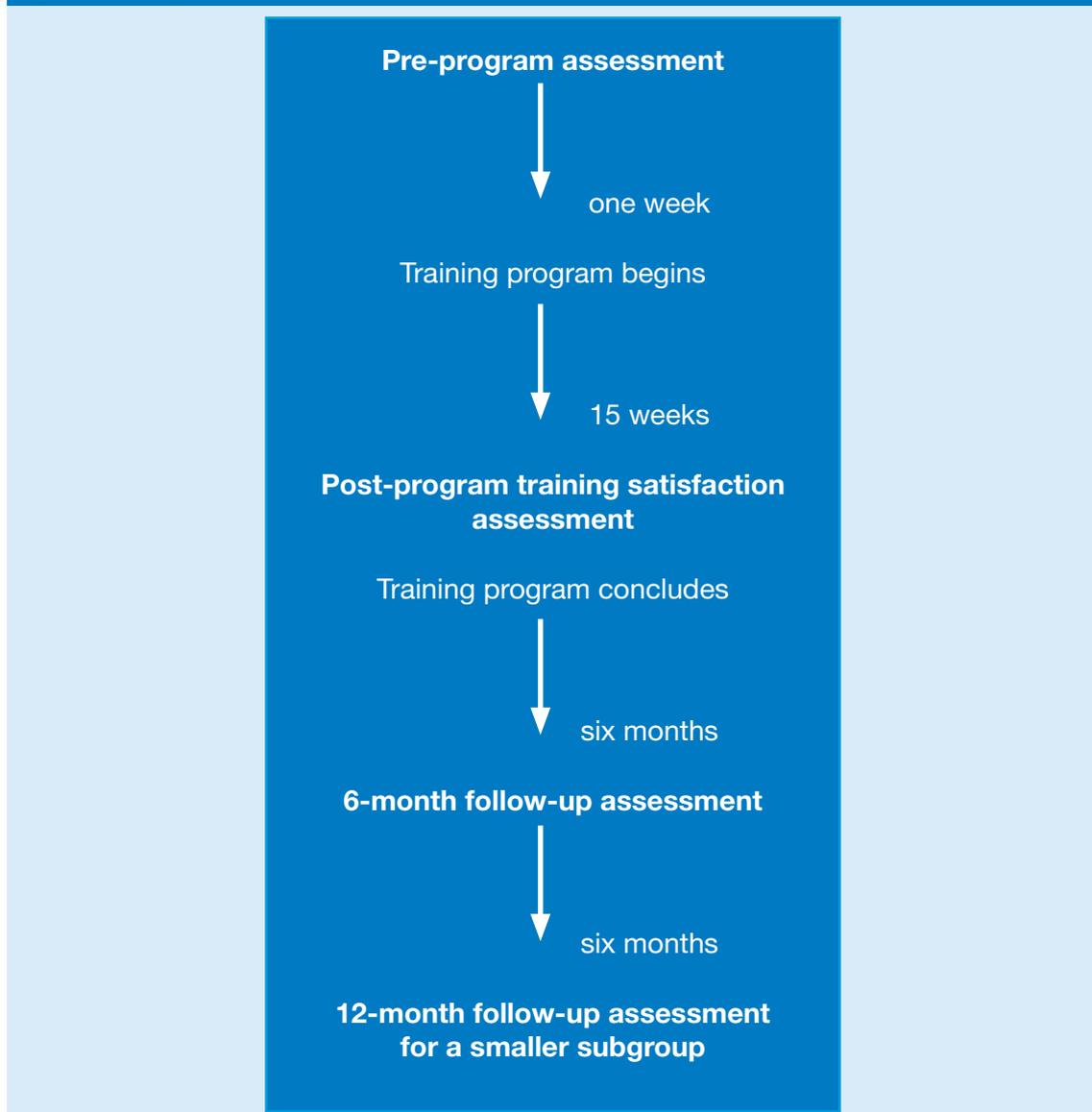
Design

The training component of the study was conducted over a 13-month period. New squads of recruits were normally admitted into the academy at one-month intervals, although at times two squads were admitted in the same month.

Questionnaires were administered and collected at the following four stages (for a diagrammatic representation see Figure 4.2 below):

- **Pre-program:** one week before either the resilience or control training program
- **Post-program:** immediately after the program (on training satisfaction)
- **Six-month follow-up:** six months after completion of the program
- **12-month follow-up:** 12 months after completion of the program.

Figure 4.2: Design of questionnaire administration



The questionnaire was administered during a normal teaching period at the academy, with no training or commanding officers present. A researcher was present during all sessions and was available to all recruits before, during and after survey completion to answer any questions they may have had.

The training programs

In total, 18 squads participated in the evaluation of the training programs. The structure and content were identical for all the squads that received the resilience training, and for all the squads that received the control training. The researchers coordinated and attended all of the sessions. The researchers delivered all sessions except for Session 1 (for both the resilience and control groups), which was delivered by the Clinical Services unit of Victoria Police and a member of either the Victoria Police Homicide unit or the Victoria Police Major Collisions unit. In addition, the first 20 minutes of Session 5 (for both the resilience and the control groups) were presented by the Clinical Services Unit and the Employee and Support Unit.

The resilience training program consisted of five sessions held over the 15 weeks the recruits attended the police academy. All the presenters used the trainer manual developed as part of this research, in each of the sessions. The training sessions were consistently held at the same time points of the recruits' 20-week stay at the academy. The time points were the same for both the resilience and the control training groups.

A large number of the sessions were also rated by an independent assessor, who rated the trainer's adherence to the trainer manual.

Measures

Four different questionnaire packages were administered at each of the four assessment time points (see Figure 4.2). The questionnaires that were administered at each assessment time point are detailed below in Table 4.1. At each assessment (pre-program, post-program, six-month follow-up, 12-month follow-up) the recruits completed the questionnaire package in the presence of a researcher.

Table 4.1: Questionnaires that were administered at pre-program, post-program, six-month and 12-month follow-up

Pre-program	Post-program	Six-month follow-up	12-month follow-up
DASS-21	DASS-21	DASS-21	DASS-21
ASSIST	DEVS3	ASSIST	ASSIST
ISEL-SF	CEQ	ISEL-SF	ISEL-SF
ADAS	Training Satisfaction	ADAS	ADAS
STAXI (Trait Anger Subscale Only)	Training Importance	PLES	PLES
LOT-R		PSS-SR	PSS-SR
History of Traumatic Events Scale		MBI-HSS	MBI-HSS
TIPI		SF-36	SF-36
SF-36		Training satisfaction	Support services access
CD-RISC		Training importance	
		Support services access	

Note: ASSIST=Alcohol, Smoking and Substance Involvement Screening Test; CD-RISC=Connor–Davidson Resilience Scale; CEQ=Credibility / Expectancy Questionnaire; DASS-21=Depression, Stress and Anxiety Scale–21-item short form; DEVS3=Distress Endorsement Validation Scale; ISEL–SF=Interpersonal Support Evaluation List–short form; MBI–HSS=Maslach Burnout Inventory–Human Services Survey; PLES=Police Life Events Schedule; PSS–SR=The Posttraumatic Stress Diagnostic Scale–Self report; History of Traumatic Events Scale=degree of trauma from the traumatic incident per DSM-IV criteria A.1 and A.2; STAXI=State Trait Anger Expression Inventory; TIPI=Ten-Item Personality Inventory; Training Importance / Satisfaction=Importance/ satisfaction of the training that the participant received.

At the pre-program assessment demographic information was also collected, while at the post-program assessment two non-standardised instruments were utilised. These instruments were used to collect information regarding (a) participant satisfaction with each of the training modules; and (b) participants' ratings of the importance of each of the training modules.

At six-month follow-up, participant satisfaction and participant importance rating measures used at the post-program assessment were administered once again. A non-standardised measure of support services accessed (see p. 49) was also used.

Demographics

General demographics were obtained using a questionnaire that asked questions related to age, sex, relationship status, religion, ethnicity, education, personal history of psychiatric illness and family history of psychiatric illness.

The Depression, Anxiety and Stress Scale

Depression, stress and anxiety were measured using the short-form version of the Depression, Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995), DASS-21. This 21-item self-report instrument is designed to measure the three related negative emotional states of depression, anxiety and stress. Each of the three subscales comprise seven 4-point severity/frequency scales ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time). Acceptable levels of reliability and validity have been reported, with Cronbach's alphas of 0.94, 0.87 and 0.91 reported for the three subscales respectively (Antony, Bieling, Cox, Enns, & Swinson, 1998). Test-retest reliability coefficients for the full 42-item version of 0.71, 0.79 and 0.81 were noted over a two-week period (Lovibond & Lovibond, 1995). DASS-21 has a number of advantages over the 42-item DASS, including having fewer items, a cleaner factor structure and smaller inter-factor correlations (Antony, et al., 1998).

The Interpersonal Support Evaluation List-12

Social support was measured by the 12-item Interpersonal Support Evaluation List-12 (ISEL-12), which is the short-form version of the 40-item Interpersonal Support Evaluation List (ISEL; Cohen, Mermelstein, Kamarck, & Hoberman, 1985). Initially designed to measure individuals' perceptions of the availability of four separate functions of social support during times of stress (communicative support, positive comparison, tangible assistance and feelings of belonging), ISEL has been subjected to extensive reliability and validity testing (Cohen, et al., 1985) and has shown itself to be internally consistent and valid with the general population (Brookings & Bolton, 1988). ISEL-12 provides an overall measure of perceived social support and consists of three subscales (appraisal, belonging, tangible support).

The Alcohol, Smoking and Substance Involvement Screening Test

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST; WHO ASSIST Working Group, 2002), is an eight-item self-report screening measure used to detect both alcohol and psychoactive substance use, and related problems. It covers 10 substances: tobacco, alcohol, cannabis, cocaine, amphetamine-type stimulants, inhalants, sedatives, hallucinogens, opioids and 'other drugs'. A full description of the scoring approach is provided by Humeniuk et al. (2008).

This questionnaire is particularly relevant for the study as it is able to detect risky but non-dependent illicit drug use (Dennington, Humeniuk, Newcombe, Ali, & Vial, 2007), and was specifically designed for use as a screening instrument in primary health care (Humeniuk, et al., 2008). Several different domains can be derived for each respondent, such as a 'specific substance involvement score' and a 'global continuum of risk

score'. The average test–retest reliability coefficients range from $\alpha = .90$ (consistency of reporting 'ever used' substance) to a low of $\alpha = .58$ (regretted what was done under the influence of substance), while the average coefficients for substance classes ranged from $\alpha = 0.61$ for sedatives to $\alpha = 0.78$ for opioids (WHO ASSIST Working Group, 2002).

ASSIST has been found to have good reliability and validity for an Australian population (Newcombe, Humeniuk, & Ali, 2005) and a feasible and reliable approach for primary care settings (WHO ASSIST Working Group, 2002). ASSIST demonstrates good concurrent validity with the Alcohol Use Disorders Test (AUDIT; $r = 0.082$), as well as with the Addiction Severity Index–Lite (ASI–Lite; $r = 0.76–0.88$) and the Revised Fagerstrom Tolerance Questionnaire ($r = 0.078$), and also demonstrates good specificities (50–96%) and sensitivities (54–97%) for most substances (Humeniuk, et al., 2008).

The Abbreviated Dyadic Adjustment Scale

Sharpley and Rogers's (1984) Abbreviated Dyadic Adjustment Scale (ADAS) is a measure of relationship satisfaction. This seven-item self-report measure is derived from the 32-item Spanier Dyadic Adjustment Scale (Spanier, 1976). Alpha reliability for the ADAS is $\alpha = 0.76$; there are item-total correlations of $\alpha = 0.57$ or greater, and the inter-item correlations range from $\alpha = 0.34$ to $\alpha = 0.71$ (Sharpley & Rogers, 1984). The ADAS correlated highly with, $r > 0.85$, with the full Dyadic Adjustment Scale (Sharpley & Rogers, 1984) and has good test–retest reliability (Hunsley, Best, Lefebvre, & Vito, 2001).

The Spielberger Trait Anger Scale

The 10-item Spielberger Trait Anger Scale is a self-report questionnaire measuring an individual's disposition to anger over time. It is a subscale of the 44-item State-Trait Anger Expression Inventory (STAXI; Spielberger, 1988). For the purposes of this study, only the Trait Anger subscale was utilised. On this scale respondents rate their typical experience with anger on a four-point scale ranging from 1 (almost never) to 4 (almost always). An overall trait anger score is obtained by summing each of the individual items, and two further subscales are yielded: angry temperament (T–Anger/T) and angry reaction (T–Anger/R). The trait anger subscale has reliability coefficients of 0.82 for both male and female adults (Spielberger, 1991). The angry temperament subscale has reliability coefficients of 0.89 and 0.88, for adult men and women respectively, while the angry reaction subscale has reliability coefficients of 0.69 for both male and female adults (Spielberger, 1991). STAXI has good convergent and divergent validity (Spielberger, 1991) and a good level of reliability over a two-week period for trait anger (test-retest reliability $r = .74$, Bishop & Quah, 1998).

The Life Orientation Test – Revised

Dispositional optimism was measured using the 10-item self-report measure known as the Life Orientation Test – Revised (LOT-R; Scheier, Carver, & Bridges, 1994). Six core items are measured on a five-point Likert scale, which ranges from 0 (strongly disagree) to 4 (strongly agree). The remaining four items are included to obscure the intent of the scale. Core items are evenly divided between negatively and positively worded items. Total scores range from 0 to 24, with higher totals suggestive of greater optimism.

Cronbach's $\alpha = 0.78$ for the six items used to calculate the optimism score, indicating that the measure has an acceptable level of internal consistency (Scheier et al., 1994). The LOT–R also appears stable over time as test–retest reliability has been measured as $r = 0.79$ over a 28-month interval (Scheier, et al., 1994). Only modest correlations emerge between the LOT–R and measures of neuroticism, self-esteem and trait anxiety (range $\alpha = -0.35$ to $\alpha = 0.54$) (Scheier, et al., 1994), suggesting that responses to the LOT–R tap into a construct distinct from established personality traits.

The History of Traumatic Events Scale

The History of Traumatic Events Scale is a 14-item self-report measure of whether an individual has experienced a traumatic event in the past (directly or observed), the number of times it was experienced and the degree of distress that was experienced, both at the time and currently, as a result of the event. The inventory offers a range of events that would be broadly experienced as traumatic, and also allows participants to name a traumatic experience not mentioned, or to indicate that a traumatic experience occurred without specifying it. Respondents indicate their distress regarding the experience using a five-point Likert-Type scale ranging from 1 (no distress) to 5 (extreme distress). The variable history of personal trauma was calculated from responses on this measure by adding the number of traumatic experiences endorsed by the participant, where they rated the experience on the Likert-Type scale as being 3 or greater at the time. This was to avoid including experiences the participant endorsed but did not experience as traumatic. This inventory is an adaptation of the trauma screen that forms part of the Posttraumatic Stress Scale (PSS-SR; Foa, Riggs, Dancu, & Rothbaum, 1993) and that was first used in a study conducted by Wright (2005).

The Ten-Item Personality Inventory

Personality was measured using the Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003), a newly developed 10-item version of the NEO Personality Inventory Revised (Costa & McCrae, 1995). The questionnaire provides a brief measure of the 'big five' personality dimensions: extroversion, openness to experience, agreeableness, conscientiousness and emotional stability. Responses are measured on a seven-point scale ranging from 1 (disagree strongly) to 7 (agree strongly). The measure has been shown to reach adequate levels of convergent (mean $r = 0.77$) and discriminant validity (mean $r = 0.20$), and test-retest reliability ($r = 0.72$) (Gosling, et al., 2003).

The Connor–Davidson Resilience Scale

The Connor–Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) is a recently developed 25-item measure of resilience. The CD-RISC comprises items reflecting several aspects of resilience, including a sense of personal competence, tolerance of negative affect, positive acceptance of change, trust in one's own instincts, sense of social support, spiritual faith, and an action-oriented approach to problem-solving.

Items are rated on a five-point scale ranging from 0 (strongly disagree) to 4 (strongly agree). The total score ranges from 0 to 100, with higher scores reflecting greater resilience. A study of the psychometric properties in the general population and in patient samples found the internal consistency for the full scale to be Cronbach's $\alpha = 0.89$ and acceptable convergent and discriminant validity (Connor & Davidson, 2003). Test-retest reliability was conducted only with a group of patients with Generalised Anxiety Disorder (GAD) and PTSD, and has been found to be $r = 0.87$.

SF-36

A multi-purpose short-form survey, the SF-36 (Ware & Sherbourne, 1992) yields an eight-scale profile of functional health and wellbeing, as well as physical and mental health summary measures and a preference-based health utility index. Cronbach's coefficients for each of the eight subscales exceed 0.80, except for social functioning, where $\alpha = 0.76$ (Jenkinson, Coulter, & Wright, 1993). The scale has been found to have good convergent and discriminant validity (McHorney, Ware, & Raczek, 1993). Using the Bland and Altman technique for calculating test-retest reliability, Brazier, Harper and Jones (1992) found that for all dimensions, 91–98 per cent of cases lay within the 95 per cent confidence interval. The maximum mean difference in dimension scores was 0.80 (Brazier, et al., 1992).

The Police Life Events Schedule

The Police Life Events Schedule (PLES; Carlier & Gersons, 1992) is a 42-item measure of the type and number of traumatic incidents experienced by police officers and the degree to which they felt threatened, anxious and helpless at each of the incidents. The incidents can be divided into two categories: violent (eg taking part in a raid/arrest accompanied by violence) and sad or depressing (eg finding a corpse). Participants indicate for each item whether they have experienced it or not (yes or no) at any time in their career and then rate the level of threat, anxiety and helplessness that they experienced at the time. The reliability coefficient for the total score has been found to be Cronbach's alpha 0.87 (Carlier & Gersons, 1992).

For the purposes of the current study, PLES was modified. If participants indicated that they had experienced a particular event, they were also required to indicate the number of times they had experienced it. Participants did not rate the level of fear, anxiety and helplessness that they experienced for each event. Instead, they were required to rate on a five-point Likert type scale the degree of distress they experienced both at the time (1=None, 5=Extreme) and currently (1=None, 5=Extreme). This alternative rating system was used so that comparisons with the History of Traumatic Events Scale could be made.

The Maslach Burnout Inventory – Human Services Survey

Maslach and Jackson's (1996) Maslach Burnout Inventory – Human Services Survey (MBI-HSS) is a 22-item self-report measure designed to measure the following three aspects of burnout in health services employees: (a) emotional exhaustion, (b) depersonalisation and (c) lack of personal accomplishment. The emotional exhaustion subscale assesses feelings of being emotionally overextended and exhausted by one's work. The depersonalisation subscale assesses an unfeeling and impersonal response to the recipients of one's care. The personal accomplishment subscale describes feelings of competence and successful achievement in one's work with people. The items are written in the form of statements about personal feelings or attitudes and are answered in terms of frequency with which the respondent experiences feelings, on a seven-point scale, ranging from 0 (never) to 6 (every day).

Leiter and Schaufeli (1996) have shown that the internal consistency for each of the three subscales is acceptable for each of Emotional Exhaustion ($\alpha = 0.74$), Depersonalisation ($\alpha = 0.89$) and Personal Accomplishment ($\alpha = 0.69$) subscales. High levels of Emotional Exhaustion and Depersonalisation and low levels of Personal Accomplishment are indicative of burnout (Bakker, Killmer, Siegrist, & Schaufeli, 2000). The test-retest reliability of the three subscales has been found to be stable over time, with correlations ranging from 0.50 to 0.82 found for time spans of three months to one year (Leiter & Durup, 1996).

The Posttraumatic Stress Diagnostic Scale

An assessment was made of the level of intrusions, avoidance and arousal caused by policing traumatic incidents using the PTSD Symptom Scale-Self-Report (PSS-SR; Foa, et al., 1993). This questionnaire is based on the Diagnostic and Statistical Manual of Mental Disorders – 4th edition (DSM-IV; APA, 1994) criteria for trauma symptomatology and contains items assessing the 17 PTSD symptoms, which make up the three clusters and assesses incapacity due to these problems.

For all items, symptom frequency over the preceding two weeks is reported on a four-point scale. A total score is obtained by summing each symptom rating. Subscale scores are calculated by summing symptoms in the Re-Experiencing, Avoidance and Arousal clusters. Foa and colleagues (1993) found the Cronbach's α coefficient for the total score to be 0.91, while the subscale α 's ranged from 0.78 to 0.82. In addition, Foa and colleagues (1993) found the one-month test-retest reliability for the total score to be 0.74, while test-retest reliability for subscales ranged from 0.56 to 0.71. Convergent validity of the PSS-SR, with the IES and State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1970) was demonstrated, with correlations ranging from 0.52 to 0.81 (Foa et al., 1993). Acceptable levels of validity and reliability have

been reported in assessment of the symptom severity scale, with a Cronbach's alpha of 0.92 and test-retest reliability of 0.83 across 10–22 days (Foa, 1995).

Coping style

Two non-standardised items were used to assess coping style. Participants were asked to rate two statements on a seven-point scale ranging from 1 (strongly agree) to 7 (strongly disagree). The first statement sought to measure emotion-focused coping and consisted of, 'When I am worried about something I talk to friends'. The second statement sought to measure problem-focused coping and consisted of, 'When I am worried about something I try to do something to fix the situation'.

Access of support services

Ten non-standardised items were used to assess the degree to which the officers accessed a number of support services over the preceding six-month period. Participants were asked to indicate whether or not they accessed 10 different support services and, of those services they accessed, their degree of satisfaction on a five-point scale ranging from 1 (very dissatisfied) to 5 (very satisfied). Four Victoria Police services were assessed (clinical services, employee/welfare support, chaplain, and peer support) and six external services (psychologist, psychiatrist, social worker, priest/ spiritual advisor, GP and counsellor/other).

The Distress/Endorsement Validation Scale (III)

The Distress/Endorsement Validation Scale III (Devilley, 2004) is a 10-item measure of course / intervention satisfaction. Items are measured on a nine-point anchored Likert scale. The scale demonstrates high internal consistency (Cronbach's $\alpha = 0.84$), and inter-item correlations of between 0.67 and 0.74 (Devilley, 2004).

The Credibility/Expectancy Questionnaire

The Credibility/Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000) is a self-report questionnaire developed for use by Borkovec and Costello (1993) and derives two factors: treatment credibility and expectancy change (Devilley & Borkovec, 2000). For the current study, the wording of the items was modified slightly so that participants rated their credibility for, and expectancies of, the training program. Items for both the credibility and expectancy subscales are rated on a nine-point scale ranging from 1 (not at all) to 9 (very much).

The scale has demonstrated factors that are stable across multiple populations, high internal consistency (standardised α of between 0.84 and 0.85 for the whole scale) and good test-retest reliability (α of 0.82 for expectancy and 0.75 for credibility) (Devilley & Borkovec, 2000). The CEQ was administered on the final day of the training program, after the training rationale had been given to the participants of the course. The wording was modified slightly so that the questions related to a training program rather than a treatment program. For analyses, all items were standardised and composites were derived for the credibility and expectancy factors.

Training adherence

Trainers' adherence to the prescribed content of each of the training sessions was assessed by an independent assessor. For each of the sessions (in both conditions) a training adherence integrity summary was created. For each of these integrity summaries, the independent assessor was required to check a list of key concepts that should have been covered in the session. The independent assessor was also required to provide an overall rating of the integrity of the training in session. The overall training integrity rating was scored on a six-point scale ranging from 0 (unacceptable) to 6 (high).

Chapter 4: Detailed description of the dataset used in the analyses

Statistical analysis

All data entry and analyses were conducted using Statistica (version 6.1) and ClinTools Version 4.1 (Devilly, 2007). Rather than simply considering resilience in terms of PTSD symptomatology, this study will inspect the concept as comprising three life domains. An individual will be considered resilient only if they show no change or some improvement across all three domains.

The first of the domains, Health and Wellbeing, will encompass factors associated with general health and wellbeing. Measures of general health, affective distress (depression, anxiety and stress), drug and alcohol use, and relationship satisfaction will be used for assessment. Resilience in this domain is equal to either no change or improvement across time, for all four of these measures.

The second of the domains, Reactivity to Trauma, will reflect the amount of self-reported PTSD symptomatology experienced by the individual following exposure to potentially traumatic policing events. A measure of PTSD symptomatology will be used to assess this domain, and resilience will equal a score on this measure that is below a clinical cut-off point.

The third of the domains, Workplace Functioning, will reflect the individual's ability to work and function in a stressful occupation. A measure of burnout will be used to assess this domain, and in addition the individual's use of both police and community mental health services will be measured. Resilience in this domain will equal a score on the burnout measure that is below a clinical cut-off point.

Prior to analysis all independent variables were examined for accuracy of data entry, missing values, presence of univariate and multivariate outliers and the distribution of data. Cases with a small number of missing values (3 or less) were retained, and missing values were replaced with the individual's mean score for the subscale of the measure where the missing value was located (when the measure contained subscales), or with the individual's mean score for the corresponding measure. Cases that were missing a significant number of values on any one measure (more than 3) were deleted from analyses involving this measure.

Both graphic and statistical methods were used to determine whether the data was normally distributed. For variables that were not normally distributed, transformations were applied.

One outlier was detected for substance involvement at six-month follow-up, and this case was therefore removed from analyses involving this measure. A case with high scores for affective distress at six-month follow-up and two cases with high trauma symptomatology scores at six-month follow-up were also identified. Upon closer inspection, the scores for these cases were considered to be believable and were therefore retained. However, due to the low condition means for affective distress and trauma symptomatology, these scores are considered outliers. As a result, analyses involving six-month follow-up affective distress and six-month follow-up trauma symptomatology will be conducted using non-parametric tests. No multivariate outliers were identified.

Attrition, session attendance, questionnaire completion and training integrity adherence

Sample retention was high over the course of the training program, with the majority of recruits attending all five training sessions. Of the 311 participants who completed the pre-program assessment 10 failed to complete their operational training at the academy. As a result they failed to complete the resilience/control

training and were excluded from the study. This represented 3 per cent of the initial sample. Of the 301 recruits who completed the training program, 280 (93%) completed all five sessions, and 21 (7%) missed one of the five sessions. Recruits who missed a session did so for reasons unrelated to the study (eg physical illness).

The completion rate of the post-program (training satisfaction) assessment was high: 287 out of the 301 recruits who completed the training program also completed the post-program assessment (95%). The completion rate of the six-month follow-up assessment was also relatively high: 281 of the 301 recruits who completed the training program also completed the six-month follow-up assessment (93%). The attrition rate from the pre-program assessment to six-month follow-up was relatively low, at 10 per cent. Only one-third of the sample was asked to complete the 12-month follow-up assessment, so the attrition rate was not calculated for this assessment time point.

Overall, for the 18 different squads that participated in the two different training programs, 60 separate training sessions were run. Of these 34 (57%) were attended by an independent assessor who rated the trainer's adherence to the training manual. The mean training adherence rating was high, at 5.50 ($SD = 0.51$).

Descriptive statistics

Of the 281 participants, over half were aged under 29 years (see Table 5.1). With respect to relationship status, 57 per cent of the sample were single, while 43 per cent were in a relationship. Participants identified with several religions: 30 per cent were Catholic, 19 per cent were of other Christian denominations, 1 per cent were Muslim and 5 per cent described themselves as 'Other'. Overall, 59 per cent of participants had some type of religious belief, compared to 41 per cent who had no religious belief.

The majority of the sample (92%) identified themselves as feeling that they were Australian, while 2 per cent reported feeling that they were Northern or Western European. Two people (0.7%) reported feeling Southern or Eastern European, two (0.7%) described themselves as Asian, one (0.4%) described themselves as African, one (0.4%) as described themselves as North American, one described themselves as South American (0.4%) and 3 per cent of the group described themselves as 'Other'.

The majority of participants reported having completed Year 12 or its equivalent (37%) as their highest academic attainment; 22 per cent reported having completed an undergraduate degree and 5 per cent a postgraduate degree. Twenty-four per cent of people reported having seen somebody for emotional problems before joining the police service. All descriptive statistics are detailed below (see Table 5.2).

As this study incorporates people who come from a wide range of backgrounds, a series of factorial, between-subjects multivariate analyses were conducted to determine whether these differences within the sample had any impact on the measures of interest throughout the analyses. MANOVAs were used, with Health and Wellbeing (ie general health, affective distress, substance involvement, and relationship satisfaction), Reactivity to Trauma (ie trauma symptomatology), and Workplace Functioning (ie burnout, police services accessed and external services accessed) as dependent variables. Independent variables in each analysis were (a) relationship status (single vs in relationship), (b) station location, (c) religious belief and (d) ethnicity (Australian ($n=292$) vs Other ($n=17$) due to small sample sizes of specific ethnic groups).

In each case Pillai's criterion was used to determine the significance of the main effect of condition as it is considered more robust than other commonly used statistics and is recommended when unequal group sizes among the independent variables are being used (Tabachnik & Fidell, 2001, p.401). The combined dependent variables were found to not be significantly influenced by (a) relationship status (single vs in relationship) (Pillai's(10,207) = 0.06, *ns*), (b) station location (Pillai's (10,206) = 0.08, *ns*), (c) religious belief (Pillai's (10,209) = 0.04, *ns*) or (d) ethnicity (Australian vs Other ($F(10, 211) = 0.06$, *ns*). Subsequently, it was considered valid to use a sample with mixed backgrounds.

Table 5.1: Age ranges of participants

Age range (years)	N	%
18–28	183	65.4
29–38	69	24.6
39–48	24	8.5
49–58	4	1.4
59–68	1	0.4

Table 5.2: Baseline characteristics of the sample

	Resilience (n=141)		Control (n=140)		All conditions (n=281)	
	Mean	SD	Mean	SD	Mean	SD
Sex (m:f)	68:73		76:64		144:137	
Relationship status (single:in a relationship)	78:63		82:58		160:121	
Religious belief (yes:no)	76:65		90:49		166:114	
Ethnicity (Australian:Other)	132:8		126:13		258:21	
Highest education attained	Postgraduate: 4 Undergraduate: 39 TAFE: 41 Year 12: 45 Did not complete Year 12: 10		Postgraduate: 10 Undergraduate: 23 TAFE: 35 Year 12: 59 Did not complete Year 12: 13		Postgraduate: 14 Undergraduate: 62 TAFE: 76 Year 12: 104 Did not complete Year 12: 26	
Number who have seen someone for emotional problems prior to joining the police	38(27%)		29(21%)		21(24%)	
Number of times that a professional was seen for emotional problems	3.13	4.62	3.53	5.83	3.33	5.25
Location of participants' police station (metropolitan: rural)	120:21		119:20		239:41	
Emotion-focused coping	2.45	1.31	2.43	1.28	2.44	1.29
Problem-focused coping	1.82	.64	1.88	0.75	1.85	0.70
History of traumatic events—number of personal trauma events where distress was '3' or greater, at the time of the event	0.78	1.31	.78	1.38	0.78	1.34
ISEL-12 Total ('interpersonal support')	38.76	3.40	38.66	3.86	38.71	3.63
ISEL-12- Belonging	11.98	1.21	11.81	1.46	11.89	1.34
ISEL-12- Tangible Support	14.66	1.65	14.66	1.83	14.66	1.34
ISEL-12- Appraisal	12.16	1.59	12.12	1.43	12.14	1.51
ADAS (relationship satisfaction)	25.89	4.62	26.34	5.19	26.11	4.91
STAXI (trait anger subscale only)	16.06	3.58	15.89	3.46	15.98	3.51
LOT-R (optimism)	16.50	3.47	16.46	3.33	16.48	3.40
CD-RISC (resilience)	76.56	10.15	78.00	10.61	77.28	10.39
TIPI- Extraversion	10.23	2.65	10.16	2.63	10.19	2.63
TIPI- Emotional Stability	11.20	2.39	11.54	2.10	11.37	2.25
TIPI- Conscientiousness	11.77	2.07	11.93	2.01	11.85	2.04

Table 5.2: (continued)

	Resilience (n=141)		Control (n=140)		All conditions (n=281)	
	Mean	SD	Mean	SD	Mean	SD
TIPI- Agreeableness	10.92	1.82	10.91	2.10	10.91	1.96
TIPI- Openness to Experience	11.06	1.92	10.98	2.13	11.02	2.03
DASS total score	12.10	12.66	11.22	11.69	11.67	12.18
ASSIST total score	18.83	16.42	18.14	16.19	18.49	16.28
SF-36 total score	84.27	10.96	86.39	8.73	85.33	9.95
Group size, number of participants—M (range)	15.7 (11–21)		15.6 (12–21)		14.83 (12–18)	

No significant differences were found between the conditions for any of the main measures at baseline. Thus, the two conditions were considered to be equal at the pre-program assessment time point.

The internal reliability of each of the measures used in the study across each time point was calculated using Cronbach's Alpha. The majority of the coefficients were within acceptable parameters and were above the accepted level of 0.70 (Tabachnik & Fidell, 2001).

Chapter 5: Results of the resilience training program evaluation

This chapter is organised according to four parts:

- (a) an exploration of the primary outcome variables
- (b) an evaluation of the efficacy of the resilience training program
- (c) an exploration of the primary outcome variables and pre-program attributes
- (d) an analysis of the 12-month follow-up subgroup data.

Within these four sections, the results from each of the analyses have been provided. The large number of analyses created a substantial volume of information, much of which is best presented in table form. To facilitate the comprehension of these results, summaries of main findings appear in shaded boxes at the top of each subsection.

Part (a): Exploration of the primary outcome variables and pre-program attributes

Summary of results: Part (a)

An exploration of the primary outcome variables and pre-program attributes produced the following findings:

- Significant correlations were found between age and affective distress, depersonalisation and number of police services accessed.
- Males and females differed significantly on level of personal accomplishment.
- Those in a relationship at the pre-program assessment were found to have significantly higher levels of general health and personal accomplishment, and lower levels of substance involvement.
- Single recruits had significantly higher levels of affective distress and trauma symptomatology than those in a relationship.
- Those at city stations had significantly greater levels of emotional exhaustion and depersonalisation than those at country stations.
- Those at country stations had significantly greater levels of affective distress at six-month follow-up.
- Higher scores on the CD-RISC measure of resilience were significantly correlated with more positive outcomes for general health, affective distress, relationship satisfaction, emotional exhaustion, depersonalisation and personal accomplishment.
- Emotional instability (which equates to neuroticism) was significantly correlated with general health, affective distress, substance involvement, relationship satisfaction, emotional exhaustion and personal accomplishment.
- Optimism correlated significantly with lower levels of affective distress, depersonalisation and emotional exhaustion.
- Trait anger correlated significantly with general health, affective distress, emotional exhaustion, depersonalisation and personal accomplishment.
- Perceived social support correlated significantly with general health, affective distress, relationship satisfaction, trauma symptomatology, emotional exhaustion, depersonalisation and personal accomplishment. A higher level of perceived social support was associated with a more positive outcome for each of these variables.

To test for relationships among the demographics variables of age, gender, relationship status, and station location and the six-month follow-up main variables (Health and Wellbeing, as measured by general health, affective distress, substance involvement, and relationship satisfaction; Reactivity to Trauma, as measured by trauma symptomatology; and Workplace Functioning, as measured by burnout, and use of support services), a number of statistical techniques were used.

Correlations (R) were performed to determine whether a relationship existed between the major variables and the age of the recruits. The results of these analyses are presented in Table 6.1. Age was found to significantly correlate with depersonalisation, with older participants having higher levels of depersonalisation. A significant

relationship was found between age and affective distress, with older participants having lower levels of affective distress than younger participants. A significant relationship was also found between age and police services access, with older participants accessing a greater number of police services than younger participants.

Table 6.1: Correlations between six-month follow-up major variables and age

	Age Six-month follow-up ¹
General Health	$R_{(p)}^2=0.06$
Affective Distress	$R_{(s)}^3=-0.17^*$
Substance Involvement	$R_{(p)}=-0.02$
Relationship Satisfaction	$R_{(p)}=0.06$
Trauma Symptomatology	$R_{(s)}=-0.06$
Burnout- Emotional Exhaustion	$R_{(p)}=-0.10$
Burnout- Depersonalisation	$R_{(p)}=-0.20^{**}$
Burnout-Personal Accomplishment	$R_{(p)}=0.12$
Police Services Access	$R_{(p)}=0.13^*$
External Services Access	$R_{(p)}=0.09$

* $p < .05$; ** $p < .01$; ¹highest $n=281$; ² $R_{(p)}$ =Pearson's correlation, two-tailed;

³ $R_{(s)}$ =Spearman's correlation, two-tailed

A number of one-way analyses of variance (ANOVAs) were conducted to investigate the relationships among gender, relationship status, and station location, and the major variables at six-month follow-up. The results of the ANOVAs are shown in Table 6.2.

Table 6.2: F-Statistics for gender, relationship status, station location and the major variables at six-month follow-up

	Gender six-month follow-up ¹ (df)F, p	Relationship status six-month follow-up (df)F, p	Station location six-month follow-up (df)F, p
Substance involvement	(1,277) 2.71, $p=0.10$	(1,277) 3.96, $p=0.04^*$	(1,276) 0.48, $p=0.49$
General health	(1,279) 3.64, $p=0.06$	(1,279) 4.27, $p=0.04^*$	(1,278) 0.52, $p=0.47$
Relationship satisfaction	(1,261) 0.01, $p=0.93$	(1,261) 3.30, $p=0.07$	(1,260) 2.99, $p=0.09$
MBI emotional exhaustion	(1,275) 0.00, $p=0.96$	(1,275) 2.28, $p=0.13$	(1,274) 4.10, $p=0.04^*$
MBI depersonalisation	(1,275) 0.60, $p=0.44$	(1,275) 1.71, $p=0.19$	(1,274) 6.48, $p=0.01^*$
MBI personal accomplishment	(1,275) 10.75, $p=0.001^{**}$	(1,275) 13.13, $p=0.001^{**}$	(1,274) 0.00, $p=0.96$
Police services access	(1,288) 0.03, $p=0.86$	(1,288) 0.30, $p=0.58$	(1,284) 1.92, $p=0.17$
External services access	(1,285) 0.61, $p=0.44$	(1,285) 1.47, $p=0.23$	(1,283) 0.11, $p=0.74$

* $p < .05$, ** $p < .01$; ¹highest $n=281$

As can be seen from Table 6.2, there was a significant relationship between gender and personal accomplishment, with males having significantly higher levels of personal accomplishment at six-month follow-up compared to females (*Hedges' \hat{g}* =0.39, representing a medium effect size).

Substance involvement at six-month follow-up was significantly related to relationship status, with those who were single having greater substance involvement than those in a relationship (*Hedges' \hat{g}* =-0.24, representing a small effect size). General health at six-month follow-up was significantly related to relationship status: those in a relationship reported better general health than those who were single (*Hedges' \hat{g}* =0.25, representing

a small effect size). Level of personal accomplishment at six-month follow-up was found to be significantly related to relationship status. A medium effect size was found (*Hedges' g*=0.44): those in a relationship reported higher levels of personal accomplishment than singles.

Station location was found to be significantly related to the emotional exhaustion domain of burnout at six-month follow-up. Those at city stations reported higher levels of emotional exhaustion than those at country stations (*Hedges' g*=.34, representing a medium effect size). Depersonalisation was also found to be significantly related to station location. Those at city stations reported greater levels of depersonalisation than those at country stations (*Hedges' g*=0.43, representing a medium effect size).

Mann-Whitney U tests were used to investigate the relationships among gender, relationship status, and station location, and affective distress and trauma symptomatology at six-month follow-up. The results of the Mann-Whitney U tests are shown below in Table 6.3.

Table 6.3: Mann-Whitney U Tests for gender, relationship status, station location and affective distress and trauma symptomatology at six-month follow-up

	Gender	Relationship status	Station Location
	Six-month follow-up ¹ U(df), z, p	Six-month follow-up U(df), z, p	Six-month follow-up U(df), z, p
Affective distress	U(1)=8550.50, z=-1.74, p=0.08	U(1) 7849, z=2.53 p=0.01*	U(1) 3761.50, z=2.31 p=0.02*
Trauma symptomatology	U(1) 5730.50, z=-1.64, p=0.06	U(1) 5340.50, z=2.62 p=0.009**	U(1) 3125.50, z=0.49 p=0.63

* $p < .05$, ** $p < .01$; ¹highest n=281

Relationship status was found to have a significant effect upon affective distress, with singles reporting higher levels of affective distress at six-month follow-up than those in a relationship. Singles were also more likely to report higher levels of trauma symptomatology at six-month follow-up. Those in a country station reported significantly higher levels of affective distress than those in metropolitan stations.

Correlations (R) were used to assess the degree to which resilience (as measured by the CD-RISC) was associated with the major variables at six-month follow-up (Table 6.4).

Table 6.4: Correlations between six-month follow-up major variables and CD-RISC score

	CD-RISC score (resilience measure)
	six-month follow-up ¹
General health	$R_{(p)}^2 = 0.15^*$
Affective distress	$R_{(s)}^3 = -0.21^{**}$
Substance involvement	$R_{(p)} = 0.03$
Relationship satisfaction	$R_{(p)} = 0.18^*$
Trauma symptomatology	$R_{(s)} = 0.01$
Burnout—emotional exhaustion	$R_{(p)} = -0.15^*$
Burnout—depersonalisation	$R_{(p)} = -0.15^*$
Burnout—personal accomplishment	$R_{(p)} = 0.36^{**}$
Police services access	$R_{(p)} = -0.03$
External Services Access	$R_{(p)} = -.04$

* $p < .05$; ** $p < .01$; ¹highest n=281; ² $R_{(p)}$ =Pearson's correlation, two-tailed;

³ $R_{(s)}$ =Spearman's correlation, two-tailed

Significant correlations were found between CD-RISC score and general health, affective distress, relationship satisfaction, emotional exhaustion, depersonalisation and personal accomplishment at six-month follow-up.

Each of these correlations occurred in the expected direction—that is, higher resilience scores were correlated with more positive outcomes.

Correlation (R) analysis was used to assess the degree to which pre-program personality variables were associated with the major outcome variables. This is presented in Table 6.5.

	Extroversion	Agreeableness	Conscientiousness	Emotional stability	Openness
General health	$R_{(s)}^2=-0.01$	$R_{(s)}=0.13^*$	$R_{(s)}=0.25^{**}$	$R_{(s)}=0.23^{**}$	$R_{(s)}=0.12^*$
Affective distress	$R_{(s)}=-0.09$	$R_{(s)}=-0.12^*$	$R_{(s)}=-0.24^{**}$	$R_{(s)}=-0.27^{**}$	$R_{(s)}=-0.11$
Substance involvement	$R_{(s)}=0.13^*$	$R_{(s)}=-0.02$	$R_{(s)}=-0.16^{**}$	$R_{(s)}=-0.12^*$	$R_{(s)}=0.07$
Alcohol involvement	$R_{(s)}=0.15^*$	$R_{(s)}=-0.03$	$R_{(s)}=-0.20^{**}$	$R_{(s)}=-0.07$	$R_{(s)}=-0.01$
Relationship satisfaction	$R_{(s)}=0.13^*$	$R_{(s)}=0.02$	$R_{(s)}=0.16^{**}$	$R_{(s)}=0.24^{**}$	$R_{(s)}=0.06$
Trauma symptomatology	$R_{(s)}=0.12$	$R_{(s)}=0.04$	$R_{(s)}=0.07$	$R_{(s)}=-0.1$	$R_{(s)}=0.06$
Burnout—emotional exhaustion	$R_{(s)}=-0.08$	$R_{(s)}=-0.15^*$	$R_{(s)}=-0.17^{**}$	$R_{(s)}=-0.21^{**}$	$R_{(s)}=-0.11$
Burnout—depersonalisation	$R_{(s)}=-0.06$	$R_{(s)}=-0.28^{**}$	$R_{(s)}=-0.18^{**}$	$R_{(s)}=-0.11$	$R_{(s)}=-0.16^{**}$
Burnout—personal accomplishment	$R_{(s)}=0.11$	$R_{(s)}=0.16^{**}$	$R_{(s)}=0.19^{**}$	$R_{(s)}=0.24^{**}$	$R_{(s)}=0.12^*$
Police services access	$R_{(s)}=0.11$	$R_{(s)}=-0.14^*$	$R_{(s)}=-0.09$	$R_{(s)}=-0.13^*$	$R_{(s)}=0.01$
External services access	$R_{(s)}=0.09$	$R_{(s)}=0.01$	$R_{(s)}=0.01$	$R_{(s)}=-0.07$	$R_{(s)}=-0.02$

* $p < .05$; ** $p < .01$; ¹n ranges from 229 to 281; ² $R_{(s)}$ =Spearman's correlation, two-tailed

Extroversion was correlated significantly with substance involvement, alcohol involvement and relationship satisfaction. Agreeableness was significantly associated with general health, affective distress, accessing police services and, unsurprisingly, all three measures of burnout. Conscientiousness was significantly correlated with general health, affective distress, total substance and alcohol involvement, relationship satisfaction, and all three measures of burnout. Neuroticism (known as 'emotional instability' on the TIPI) was found to significantly correlate with general health, affective distress, substance involvement, relationship satisfaction, emotional exhaustion, personal accomplishment and accessing police services at the six-month follow-up. Openness significantly correlated with general health, burnout (depersonalisation) and burnout (personal accomplishment).

Each of these correlations occurred in the expected direction. For example, higher emotional stability scores (which equate to lower neuroticism scores) were correlated with more positive outcomes.

The degree to which optimism was related to the major variables was assessed using correlation (R) analysis. These results are shown in Table 6.6.

Table 6.6: Correlations between six-month follow-up major variables and optimism

	Optimism
	six-month follow-up ¹
General health	$R_{(p)}^2=0.11$
Affective distress	$R_{(s)}^3=-0.15^*$
Substance involvement	$R_{(p)}=0.01$
Relationship satisfaction	$R_{(p)}=0.10$
Trauma symptomatology	$R_{(s)}=-0.05$
Burnout—emotional exhaustion	$R_{(p)}=-0.17^{**}$
Burnout—depersonalisation	$R_{(p)}=-0.16^*$
Burnout—personal accomplishment	$R_{(p)}=0.27^{**}$
police services access	$R_{(p)}=-0.03$
external services access	$R_{(p)}=-0.01$

* $p < .05$; ** $p < .01$; ¹highest $n=281$; ² $R_{(p)}$ =Pearson's correlation, two-tailed;

³ $R_{(s)}$ =Spearman's correlation, two-tailed

Higher levels of optimism were found to be correlated with lower levels of affective distress, depersonalisation and emotional exhaustion at six-month follow-up. Those with higher levels of optimism were also found to have higher levels of personal accomplishment.

The degree to which trait anger was related to the major variables was assessed using correlation (R) analysis. These results are shown in Table 6.7.

Table 6.7: Correlations between six-month follow-up major variables and trait anger

	Anger
	six-month follow-up ¹
General health	$R_{(p)}^2=-0.15^*$
Affective distress	$R_{(s)}^3=0.28^{**}$
Substance involvement	$R_{(p)}=0.10$
Relationship satisfaction	$R_{(p)}=-0.11$
Trauma symptomatology	$R_{(s)}=0.04$
Burnout—emotional exhaustion	$R_{(p)}=0.16^{**}$
Burnout—depersonalisation	$R_{(p)}=0.24^{**}$
Burnout—personal accomplishment	$R_{(p)}=-0.16^*$
Police services access	$R_{(p)}=0.11$
External services access	$R_{(p)}=0.05$

* $p < .05$; ** $p < .01$; ¹highest $n=281$; ² $R_{(p)}$ =Pearson's correlation, two-tailed;

³ $R_{(s)}$ =Spearman's correlation, two-tailed

Trait anger was found to correlate significantly with general health, affective distress, emotional exhaustion, depersonalisation and personal accomplishment. A higher level of trait anger was associated with a poorer outcome for each of these variables.

The degree to which perceived social support was related to the major variables was assessed using correlation (R) analysis. These results are shown in Table 6.8.

Table 6.8: Correlations between six-month follow-up major variables and perceived social support

	Perceived social support six-month follow-up ¹
General health	$R_{(p)}^2=0.22^{**}$
Affective distress	$R_{(s)}^3=-0.24^{**}$
Substance involvement	$R_{(p)}=-0.10$
Relationship satisfaction	$R_{(p)}=0.22^{**}$
Trauma symptomatology	$R_{(s)}=-0.14^*$
Burnout—emotional exhaustion	$R_{(p)}=-0.21^{**}$
Burnout—depersonalisation	$R_{(p)}=-0.18^{**}$
Burnout—personal accomplishment	$R_{(p)}=0.24^{**}$
Police services access	$R_{(p)}=-0.11$
External services access	$R_{(p)}=-0.12$

* $p<0.05$; ** $p<0.01$; ¹highest $n=281$; ² $R_{(p)}$ =Pearson's correlation, two-tailed;

³ $R_{(s)}$ =Spearman's correlation, two-tailed

Perceived social support was found to correlate significantly with general health, affective distress, relationship satisfaction, trauma symptomatology, emotional exhaustion, depersonalisation and personal accomplishment. A higher level of perceived social support was associated with a more positive outcome for each of these variables.

Combining the pre-intervention variables that predicted trauma symptoms at six-month follow-up into a multiple regression analysis allowed us to inspect the contribution of these variables to outcome. Trauma severity was the dependent variable; relationship status, station location and perceived social support were the independent variables. The model accounted for 4.5 per cent of the variance (3.5% for a population adjusted estimate), with perceived social support ($b=-.16$, $p<0.02$) and relationship status ($b=.13$, $p<0.05$) significantly contributing to the model.

Affective distress at six-month follow-up correlated with many pre-program variables. Conducting a hierarchical multiple regression analysis, we put those variables into the model first that were significantly related to affective distress and were demographically related (ie relationship status, station location and age). Personality variables were included in the second step (ie agreeableness, conscientiousness and emotional stability), and pathology and outlook variables that were significantly related to distress (ie perceived social support, optimism, trait anger and resilience) were included in the third step. The result is presented below in Output 6.1

Output 6.1: Hierarchical regression of pre-program variables that relate to affective distress.

Step	R	R ²	Adjusted R ²	Std. error of the estimate	Change statistics				
					R ²	F	df1	df2	Sig. F
Demographics	0.22	0.048	0.037	13.38	0.048	4.572	3	274	0.004
Personality	0.37	0.139	0.120	12.79	0.091	9.549	3	271	0.000
Pathology	0.42	0.178	0.147	12.59	0.039	3.194	4	267	0.014

As can be seen, all three steps of the hierarchical regression significantly contributed towards the overall model. Steps 1 and 2 were put into the model first as these were seen as enduring and/ or immutable by actions of the police service. Of course, being placed at a city or country station could be altered by allocation procedures, but both locations need to be policed. Overall, 17.8 per cent of the variance of affective distress (14.7% adjusted for the population) at six-months was attributable to these three clusters of variables, with the largest incremental contribution coming from personality variables.

Looking at total substance involvement, the factors that had individually correlated with this outcome variable (relationship status, extroversion, conscientiousness and emotional stability) were entered into a multiple regression. Together they accounted for 8.65 per cent of the variance in substance involvement (7.3% for a population adjusted estimate), with extroversion ($b=0.74$, $p<0.03$) and conscientiousness ($b=-1.43$, $p<0.01$) significantly contributing to the model.

Part (b): Evaluation of the resilience training program

Summary of results: Part (b)

An evaluation of the resilience training program found the following:

- Overall, 37.9 per cent of those in the resilience condition and 32.9 per cent of those in the control condition were found to be resilient across all three domains of resilience (ie Health and Wellbeing, Reactivity to Trauma and Workplace Functioning).
- There was a non-significant trend for more people in the resilience condition to show resilience in the domain of Workplace Functioning.

Health and Wellbeing

Summary of results: Health and Wellbeing

An evaluation of the Health and Wellbeing domain found the following:

- Participants' general health increased significantly over time.
- Participants' affective distress decreased over time.
- Overall, at the pre-program assessment, 41 per cent of new recruits (both conditions combined) met criteria for substance involvement use/abuse or abuse/dependence, and 30 per cent of new recruits met criteria for alcohol use/abuse or abuse/dependence.
- At six-month follow-up, 51.2 per cent of all recruits met criteria for substance involvement use/abuse or abuse/dependence, and 56.6 per cent of recruits met criteria for alcohol use/abuse or abuse/dependence.
- The majority of participants, across conditions, showed no deterioration or improvement for (1) affective distress, (2) relationship satisfaction, (3) substance involvement and (4) general health.

A number of 2(Condition: Resilience, Control) x 2(Time: pre-program, six-month follow-up) repeated measures ANOVAs were performed to evaluate the effect of participation in the resilience training program on Health and Wellbeing. The results of the repeated measures ANOVAs are presented in Table 6.9.

As shown, there was a significant increase in general health across Time (pre-program and six-month follow-up), irrespective of Condition ($F(1, 278)=4.63$, $p<0.04$), and this represented a small effect size (Hedges' $\hat{g}=0.14$, 95% CI: -0.30, -0.03). No other analyses reached significance.

Table 6.9: 2(Condition) x 2(Time) repeated measures ANOVA for the pre-program to six-month follow-up on major variables

	Time		Analysis			
	Pre-program M (SD)	six-month Follow-up M (SD)		(df) F	p	Hedges' \hat{g} (95% CI)
Substance involvement	18.67	19.07	T	(1, 277) 0.36	ns	
	(16.24)	(14.29)	C	(1, 277) 0.001	ns	
			T x C	(1, 277) 2.12	ns	
General health	85.28	86.72	T	(1, 278) 4.63	p=0.03*	-0.14 (-.30-.03)
	(10.26)	(10.79)	C	(1, 278) 1.12	ns	
			T x C	(1, 278) 2.52	ns	
Relationship satisfaction	26.22	26.46	T	(1,261) 0.49	ns	
	(4.74)	(5.42)	C	(1,261) 3.02	ns	
			T x C	(1,261) 1.11	ns	

¹Time; ²Condition; *p<0.05

Affective distress and relationship satisfaction

Due to the presence of a high score for affective distress (a score which was deemed to be accurate), an ANOVA was conducted on the change score for affective distress. This change score represented the difference between participants' score for affective distress pre-program and their score for affective distress at six-month follow-up, and these scores were found to be normally distributed. Participants' affective distress score decreased over time (*mean decrease*=1.15, *SD*=14.10), but there was no significant interaction between change in affective distress over time and condition ($F(1,277)=0.03$, *ns*).

Further analyses were conducted to investigate the reliability of change in some of the major variables from pre-program to six-month follow-up. In order to determine how many recruits showed reliable change after participating in the resilience training program, a reliable change (RC) index was calculated for affective distress and relationship satisfaction. As outlined by Maassen (2000) the difference between observed pre- and post-test scores are an obvious measure of change. However, only if the variables assessed perfectly measure the phenomenon they are supposed to measure will the observed difference really be dependable. Observed differences in pre- to post-test scores may be partially or even totally due to measurement error, practice effects, or sample fluctuations, and it has become increasingly important to assess the extent to which any observed changes in pre- to post-test scores are statistically reliable (Maassen, 2000).

All RC indices in this study were calculated using Devilly's (2007) Reliable and Clinical Change Generator, which is based on the formulae of Jacobson and Truax (1991). These authors suggested that an RC index larger than 1.96 ($p<0.05$) is unlikely to occur without actual change in the individual. The reliability data for affective distress used in the RC calculations was obtained from the thesis of McGrail (2006), due to the fact that test-retest reliability for the total DASS-21 score has not been previously reported by the authors of this measure. Reliability data for relationship satisfaction were obtained from Hunsley and colleagues (2001).

Tables 6.10 and 6.11 show the number of recruits who showed a reliable change (for both no deterioration and improvement) for affective distress and relationship satisfaction at the six-month follow-up assessment.

Table 6.10: Number and percentage of recruits who had reliably deteriorated, improved or stayed the same for affective distress

	Affective distress			
	Deterioration N(%)	No deterioration N(%)	Improvement (RCI=15.73) N(%)	Total (no deterioration/ improvement) N(%)
Resilience (n=140)	12 (8.6%)	118 (84.3%)	10 (7.1%)	128 (91.4%)
Control (n=140)	7 (5%)	121 (86.4%)	12 (8.6%)	133 (95%)

Note: RCI=Reliable Change Index for a change with at least 95% confidence

Table 6.11: Number and percentage of recruits who had reliably deteriorated, improved or stayed the same for relationship satisfaction

	Relationship satisfaction			
	Deterioration N(%)	No deterioration N(%)	Improvement (RCI=2.85) N(%)	Total (no deterioration/ improvement) N(%)
Resilience (n=129)	43 (33.3%)	43 (33.3%)	43 (33.3%)	86 (66.6%)
Control (n=126)	35 (27.8%)	46 (36.5%)	45 (35.7%)	91 (72.2%)

Note: RCI=Reliable Change Index for a change with at least 95% confidence

Chi-square tests revealed that there was no significant difference between the conditions in the numbers of people who had no deterioration/improvement for affective distress compared to those who had deteriorated ($\chi^2(1)=1.41$, *ns*; see Table 6.10). There was also no significant difference between the conditions in the numbers of people who had no deterioration/improvement for relationship satisfaction compared to those who had deteriorated ($\chi^2(1)=0.93$, *ns*; see Table 6.11).

Substance involvement

It was not advisable to calculate RC scores for total substance involvement, because a total substance involvement score does not make for a coherent approach to measuring change (for instance, one could decrease in alcohol consumption and increase in heroin use, netting a 'no-change' result). However, ASSIST cut-off scores for the Australian population have been published (Newcombe et al., 2005). Therefore, a chi-square analysis was performed to determine the number of recruits in both the resilience and the control conditions, who reported substance involvement pre-program and at six-month follow-up, which was at (a) below risk level, (b) use/abuse level or (c) abuse/dependence level. The scoring method and categorisations were those used and found by Newcombe et al (2005) to most accurately reflect real-world diagnoses of 'abuse' (through the MINI International Neuropsychiatric Interview criteria for current abuse) or 'dependence' (as found by an independent evaluation by a registered psychologist).

A Total Substance Involvement, as used in this report and consistent with Newcombe et al. (2005), comprised the cumulative score for all substances (including tobacco). Alcohol involvement is also reported and analysed separately, this being a major focus of the current research.

The numbers of recruits with total substance involvement and alcohol involvement scores above the risk cut-off scores, for the pre-program and six-month follow-up assessments, are shown in Table 6.12.

As can be seen in this table, no major (and, indeed, significant) differences were found. In particular, no

significant difference was found between the resilience and control conditions for the number of recruits who had below risk level use/abuse criteria or abuse/dependence criteria alcohol involvement scores at the six-month follow-up assessment.

Overall, at the pre-program assessment, 41 per cent of participants (both conditions combined) met criteria for substance involvement use/abuse or abuse/dependence, and 30 per cent of participants met criteria for alcohol use/abuse or abuse/dependence. At six-month follow-up, 51.2 per cent of all participants met criteria for substance involvement use/abuse or abuse/dependence, and 56.6 per cent of participants met criteria for alcohol use/abuse or abuse/dependence.

Table 6.12: Substance involvement and alcohol involvement cut-off scores, pre-program and at six-month follow-up

	Pre-Program			Six-month follow-up		
	Resilience (n=141) N(%)	Control (n=140) N(%)	Total sample (n=280) N(%)	Resilience (n=140) N(%)	Control (n=139) N(%)	Total sample (n=279) N(%)
Total Substance Involvement						
Below risk level	79 (56%)	83 (59.3%)	162 (57.9%)	70 (50%)	66 (47.5%)	136 (48.7%)
Met criteria for use/abuse (cut-off score=15.0)	46 (32.6%)	33 (23.7%)	79 (28.2%)	58 (41.4%)	57 (41%)	115 (41.2%)
Met criteria for abuse/dependence (cut-off score=39.50)	16 (11.3%)	24 (17.3%)	40 (14.3%)	12 (8.6%)	16 (11.5%)	28 (10%)
Alcohol involvement						
Below risk level	94 (66.7%)	98 (70%)	192 (68.6%)	62 (44.3%)	59 (42.4%)	121 (43.4%)
Met criteria for use/abuse (cut-off score=4.5)	25 (17.7%)	18 (12.9%)	43 (15.4%)	57 (40.7%)	58 (41.7%)	115 (41.2%)
Met criteria for abuse/dependence (cut-off score=10.5)	22 (15.6%)	24 (17.1%)	46 (16.4%)	21 (15%)	22 (15.8%)	43 (15.4%)

In order to evaluate whether or not individuals were resilient for substance involvement, comparisons were made between the conditions for those who had no deterioration or improvement at six-month follow-up compared to the pre-program assessment. No deterioration/improvement was defined as being when an individual's total substance involvement score was either in the same range (ie below risk level, use/abuse level, or abuse/dependence level) at both the pre-program assessment and at six-month follow-up, or when an individual's score improved from being at risk level (use/abuse or abuse/dependence) to being in the below risk-level category. Deterioration was defined as being when a person's score moved from the below risk-level category at the pre-program assessment to being at risk level (use/abuse or abuse/dependence) at six-month follow-up. These results are shown in Table 6.13.

Table 6.13: Number of participants in the resilience and the control conditions, who demonstrated resilience for substance involvement

	Resilience N(%) (n=140)	Control N(%) (n=139)
Substance Involvement (total score)		
No deterioration/improvement	119 (85%)	109 (78.4%)
Deterioration	21 (15%)	30 (21.6%)

* $p < 0.05$

As can be seen from Table 6.13, there was no significant difference between the conditions for the number of people who demonstrated no deterioration/improvement, or who demonstrated deterioration ($\chi^2(1)=2.02, ns$).

Further analysis for alcohol involvement was conducted in order to assess whether there were any significant

differences between the two conditions. A repeated measures ANOVA showed no significant effect for time ($F(1,277)=2.78, ns$) or condition ($F(1,277)=.21, ns$), and there was no significant interaction between Time and Condition ($f(1,277)=0.80, ns$).

General health

As described earlier (and shown in Table 13), a 2(Condition) x 2(Time) repeated measures ANOVA showed that there was a significant increase in General Health across Time ($F(1,278)=4.63, p<0.05$; Hedges' $\hat{g}=-0.14, 95\%CI: -.30 - 0.03$). There was no significant effect for Condition ($F(1,278)=1.12, ns$), and there was no significant interaction between Time and Condition ($F(1,278)=2.52, ns$).

It was not possible to calculate RC scores, as the test–retest reliability for the total General Health score has not been reported in the literature. However, participants' General Health scores were divided into two categories: those with General Health scores between 80 and 99, and those with scores between 1 and 79. Scores of between 80 and 99 were considered to be reflective of good General Health, while scores of 1 to 79 were considered reflective of poorer General Health. This was accomplished to make the study self-referent: with a pre-programme mean score of 85.28 (sd=10.26) this compares (as one would expect with such a sample) favourably to the general population mean score of 50 (sd=10; Ware, Kosinski, Bayliss, McHorney, Rogers, & Raczek, 1995). A score of 80 is above 99.9% of the scores from the general population, yet is below the mean score of our sample. The number of participants with scores in these categories, for each of the conditions, is shown below in Table 6.14. A chi-square analysis revealed that there were no significant differences between the numbers of participants in each of the categories, for each of the conditions at the pre-program assessment ($\chi^2(1)=0.34, ns$), or at six-month follow-up ($\chi^2(1)=0.07, ns$).

Table 6.14: Number of participants in the resilience and the control conditions, with good general health scores and poor general health scores

General health (SF-36 Total Score) range	Pre-program		Six-month follow-up	
	Resilience N(%) (n=140)	Control N(%) (n=140)	Resilience N(%) (n=141)	Control N(%) (n=140)
Good: 80–99.99	108 (77.1%)	112 (75.7%)	113 (80.1%)	114 (81.4%)
Poor: 1–79.99	32 (22.9%)	28 (20%)	28 (19.9%)	26 (18.6%)

Further comparisons were made of those who had good general health (a score between 80 and 89 or between 90 and 99) at both the pre-program assessment and at six-month follow-up compared to those who did not. For general health, no deterioration/improvement was defined as being when an individual's general health score was either in the same range (ie 1–79.99 or 80–99) at both the pre-program assessment and at six-month follow-up, or when an individual's score improved from being in the poor health range (1–79.99) to being in the good health range (80–99.99). Deterioration was defined as being when a person's score moved from the good health range at the pre-program assessment to the poor health range at six-month follow-up. These results are shown in Table 6.15.

Table 6.15: Number of participants in the resilience and the control conditions, who demonstrated resilience for general health

General health (SF-36 total score)	Resilience N(%) (n=140)	Control N(%) (n=140)
No deterioration/improvement	130 (92.9%)	122 (87.1%)
Deterioration	10 (7.1%)	18(12.9%)

* $p < 0.05$

There was no significant difference between the conditions for the number of people who demonstrated no deterioration/improvement, or who showed deterioration ($\chi^2(1)=2.54, ns$). Again, while not significant with two-tailed testing, the numbers are all going in the direction one would want from a resilience program.

Reactivity to Trauma

Summary of results: Reactivity to Trauma

An evaluation of the Reactivity to Trauma domain found the following:

- New recruits were exposed to an average 8.2 critical incidents in the preceding six months.
- New recruits were exposed to an average 3.1 different types of critical policing incidents in the preceding six months.
- 87.2 per cent of participants were exposed to a traumatic policing event in the preceding six months.
- Of those who were exposed to a traumatic policing event 49 per cent ($n=120$) rated the event as causing significant distress at the time.
- The number of different types of critical events and events rated as 3 or above on a five-point Likert-type scale of distress correlated with total trauma symptom score, but the number of any events did not correlate with trauma pathology.
- This appears to be moderated by training: having a large number of different types of events did not predict trauma symptomatology for the resilience group but it did for the control group.
- The same trend appears to be happening with events rated as 'somewhat distressing': exposure to these displayed a high degree of shared variance with trauma symptomatology for the control condition but very little for the resilience group.
- Two members of the control group were found to meet criteria for PTSD.

On average, new recruit police officers were found to have been exposed to 8.2 critical incidents ($SD=14.4$) in the preceding six-months, and 3.1 ($SD=2.65$) different types of critical policing incidents in the preceding six-months (as measured by the PLES). In order to compare the two conditions on the Reactivity to Trauma domain, one-way ANOVAs were conducted in order to assess whether the conditions had been exposed to trauma in a similar (or dissimilar) way. One-way ANOVAs showed there was no significant difference between the resilience and the control conditions for the number of critical incidents that they were exposed to ($F(1,279)=.59, ns$) and the number of different types of critical policing incidents that they were exposed to ($F(1,278)=.01, ns$).

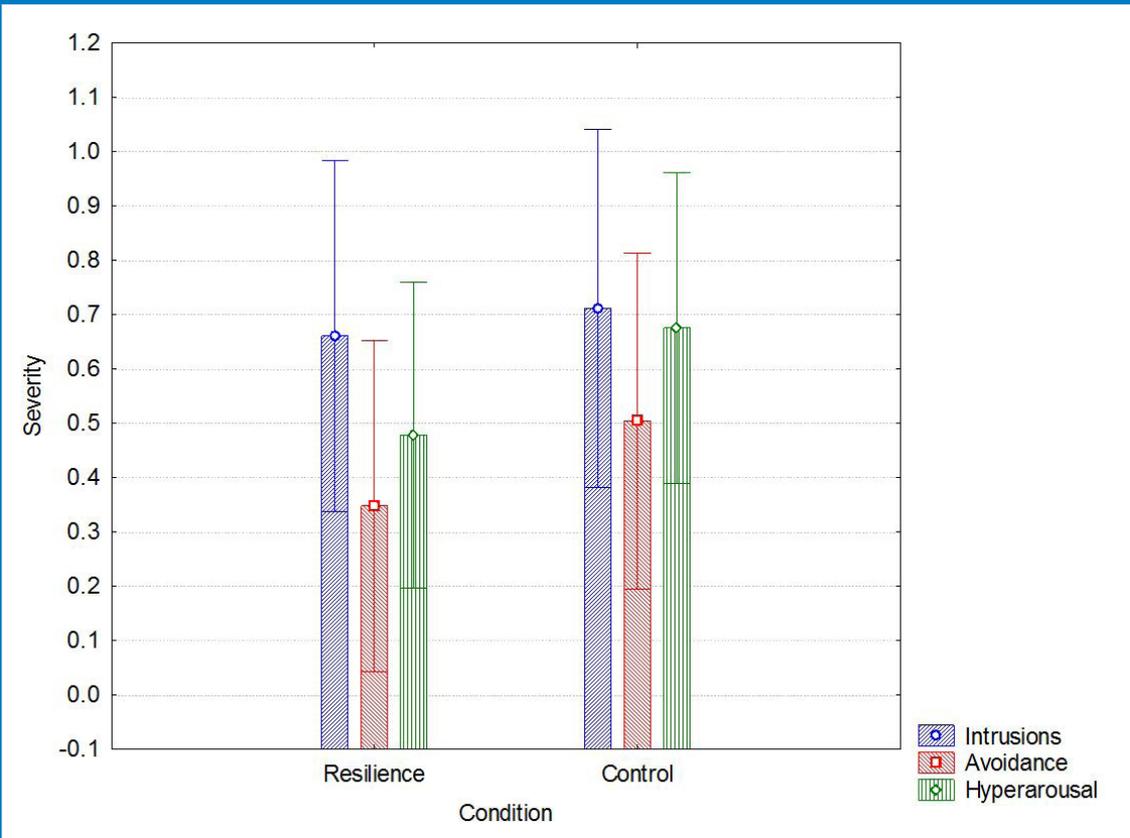
A one-way ANOVA revealed that there was no significant difference between the two conditions for the number of policing incidents that the recruits rated as causing 'distress at the time' of the event (events for which distress at the time was rated 3 or greater on the five-point scale) ($F(1, 278)=0.01, ns$).

Trauma symptomatology

A Mann-Whitney U test was performed to determine whether there were any differences between the resilience and the control condition for trauma symptomatology. No significant difference in trauma symptomatology was found between the two conditions ($U(1)=6497.50, z=-0.10, ns$). Participants in the resilience condition had very low levels of trauma symptomatology ($M=1.45, SD=2.93$), as did those in the control condition ($M=1.89, SD=5.47$). Overall, 87.2 per cent of participants were exposed to a traumatic policing event. Of those exposed to a traumatic policing event 49 per cent ($n=120$) rated the event as causing significant distress at the time. Two members of the control condition were found to meet the full criteria for PTSD.

As can be seen in Figure 6.1, mean scores for the three factors currently recognised as comprising trauma symptomatology (intrusions, avoidance and hyperarousal) were very low overall and did not appreciably differ between conditions.

Figure 6.1: Trauma Symptomatology (PSS-SR Scores) by condition



It was not possible to calculate RC scores, as the trauma symptomatology measure was only administered at six-month follow-up (after the recruits had been working for six-months and had the chance to be exposed to traumatic policing events). Therefore, the number of recruits who fell within certain clinical classifications was calculated instead.

The cut-off trauma symptomatology score was obtained from Foa, Cashman, Jaycox and Perry (1997) and required individuals scoring above 23.36 on the PSS-SR to be in the clinical range. Table 6.16 shows the number of recruits with scores below 'Cut-off C' for the Reactivity to Trauma domain at the six-month follow-up assessment.

Table 6.16: Number and percentage of recruits who were below 'Cut-off C' in the domain of Reactivity to Trauma

	Trauma symptomatology	
	N(%)	
	(Cut-off C=23.36)	
Resilience (n=119)	119 (100.0)	
Control (n=112)	110 (98.2)	

All recruits from the resilience condition had trauma symptomatology scores below 'Cut-off C', meaning that all of this group's scores were towards the normative mean. Two people from the control condition had a score greater than 'Cut-off C' and that was towards the clinical mean. A Fisher's Exact Test showed this to not reach significance (one-tailed $p=0.23$).

While total number of experienced 'critical' events did not correlate with trauma symptom severity ($r(n=225)=0.04$, ns), the number of different events attended did moderately predict pathology ($r(n=225)=0.24$, $p<0.001$), and the number of events where the officer rated their distress levels as being 3 (somewhat

distressed) or above also correlated with trauma pathology with a large effect size ($r(225)=.44, p<0.001$). To place this in some perspective, 19.44 per cent of trauma pathology has shared variance with the number of distressing events attended by the officer.

Looking within each condition derived differing results. These are presented in Table 6.17a. As can be seen, the fact that the number of different events attended was significant appears to be mainly due to the control condition and not the resilience condition. Likewise, the amount of shared variance between trauma symptomatology and attending distressing events (ie rated as at least somewhat distressing) for the control group was an exceptionally large 30.17 per cent. The resilience group shared only 6.28 per cent variance between trauma symptomatology and attending distressing events. In other words, it appears that trauma exposure is significantly related to trauma symptomatology for the control condition and less so, if at all, for the resilience group.

Table 6.17a: Relationship between trauma exposure and trauma symptomatology Using Pearson Product Moment correlations.

	Trauma exposure		
	N° of critical events	N° of different events	Events rated >2
All Conditions Trauma symptomatology	$r=0.04, N=229, p=0.56,$ $var=0.15\%$	$r=0.25, N=229, p<0.001,$ $var=6.04\%$	$r=0.44, N=225, p<0.001,$ $var=19.44\%$
Control Trauma symptomatology	$r=0.04, N=111, p=0.71,$ $var=0.16\%$	$r=0.33, N=111, p<0.001,$ $var=10.80\%$	$r=0.55, N=107, p<0.001,$ $var=30.17\%$
Resilience Trauma symptomatology	$r=0.04, N=118, p=0.71,$ $var=0.12\%$	$r=0.09, N=118, p=0.35,$ $var=0.75\%$	$r=0.25, N=118, p<0.01,$ $var=6.28\%$

Note: var = variance explained by relationship

Due to the importance of this result, we also decided to analyse using non-parametric correlations. As one would expect, trauma severity is not normally distributed, so Spearman Rank correlations were conducted and presented in Table 6.17b. The positive of this approach is that measures with small variability and non-normally distributed data can be related to each other. The negative is that the percentage of variance shared in any correlation cannot be deduced. For this reason Pearson Product Moment correlations are frequently used and then checked with non-parametric correlations.

As can be seen from Table 6.17b, a similar pattern emerges. However, this time the number of critical events comes close to correlating significantly with the control group and not with the resilience group.

In all, it appears that resilience training may have had an effect on the relationship between trauma exposure and trauma expression, with exposure having less of an effect on trauma symptomatology than for the control group. This is theoretically, and importantly, related to the expected effects of training and may be related to longer term PTSD symptomatology.

Table 6.17b: Relationship between trauma exposure and trauma symptomatology using Spearman Rank correlations

	Trauma exposure		
	No of critical events	No of different events	Events rated >2
All conditions Trauma symptomatology	$R_{(s)}=0.11, N=229, p=0.11$	$R_{(s)}=0.18, N=229,$ $p<0.008$	$R_{(s)}=0.34, N=225,$ $p<0.001$
Control Trauma symptomatology	$R_{(s)}=0.18, N=111, p<0.06$	$R_{(s)}=0.24, N=111, p=0.01$	$R_{(s)}=0.38, N=107,$ $p<0.001$
Resilience Trauma symptomatology	$R_{(s)}=.02, N=118, p=0.82$	$R_{(s)}=0.11, N=118, p=0.25$	$R_{(s)}=0.30, N=118,$ $p<0.001$

Workplace Functioning

Summary of results: Workplace Functioning

An evaluation of the resilience training program found the following:

- Significant differences were found for all three domains of burnout between the study groups (the resilience and control conditions) and comparison samples.
- The control group accessed a significantly larger number of police support services.
- The control group accessed a significantly larger number of external support services.

Burnout

A one-way MANOVA was performed to determine whether there were any differences between the resilience and the control conditions for the three burnout subscales (emotional exhaustion, depersonalisation and personal accomplishment). No significant differences were found between the conditions ($F(3,273)=1.02, ns$). The means and standard deviations of the three types of burnout, for each of the two conditions, are shown in Table 6.18. In addition, the means and standard deviations for both a clinical sample and a normal sample are shown.

Table 6.18: The means and standard deviations for each of the three types of burnout, for the resilience and control condition, and for a clinical sample and a normal sample

	Resilience (n=141) M(SD)	Control (n=136) M(SD)	Clinical sample M(SD) ^{ab}	Normal sample M(SD) ^{cd}
Emotional exhaustion	12.08 (10.48)	13.32 (9.60)	22.0 (11.0)	14.24 (7.29)
Depersonalisation	7.04 (5.55)	7.16 (5.81)	8.2 (6.1)	5.95 (4.07)
Personal accomplishment	37.05 (7.27)	35.58 (8.92)	40.1 (5.8)	29.47 (5.60)

^aMaslach, Jackson and Leiter (1996); ^bn=605; ^cSchaufeli and Van Dierendock (2000); ^dn=13,076

Single sample two-tailed t-tests were used to assess whether the resilience or the control condition differed significantly from the clinical sample (Maslach, et al., 1996) or the normal sample (Schaufeli & Van Dierendock, 2000), for each of the three types of burnout—emotional exhaustion, depersonalisation and personal accomplishment. These results are shown in Table 6.19.

Table 6.19: Single-sample two-tailed t-tests comparing the resilience and control conditions to a clinical sample and a normal sample, for each of the three types of burnout

	Clinical sample in comparison to:		Normal sample in comparison to:	
	Resilience (n=141) (df)t, p	Control (n=136) (df)t, p	Resilience (n=141) (df)t, p	Control (n=136) (df)t, p
Emotional exhaustion	(140) -11.24, p<0.001**	(135) -10.55, p<0.001**	(140) -2.45, p=0.02*	(135) -1.12, p=0.26
Depersonalisation	(140) -2.48, p=0.01*	(135) -2.08, p=0.04*	(140) 2.34, p=0.02*	(135) 2.43, p=0.02*
Personal accomplishment	(140) -4.98, p<0.001*	(135) -5.91, p<0.001**	(140) 12.38, p<0.001**	(135) 7.99, p<0.001**

*p< 0.05; **p<0.001

As can be seen from Table 6.19, single-sample two-tailed t-tests revealed that for emotional exhaustion, the resilience condition scored significantly lower in comparison to the clinical sample ($t(140)=-11.24, p<0.001$), and this represents a large effect size ($Hedges' \hat{g}=0.91, 95\%CI: -1.10, -0.72$). The control condition also scored significantly lower in comparison to the clinical sample ($t(135)=-10.55, p<0.001$), and this represents a large effect size ($Hedges' \hat{g}=-0.81, 95\%CI: -0.99, -0.62$). The resilience condition also scored significantly

lower for emotional exhaustion than the normal sample ($t(140)=-2.45, p<0.05$). This difference represents a small effect size (*Hedges' \hat{g}* = -0.29, 95%CI: -0.46, -0.07).

For depersonalisation, the resilience condition was significantly lower in comparison to the clinical sample ($t(140)=-2.48, p<0.05$), representing a small effect size (*Hedges' \hat{g}* = -0.19, 95%CI: -0.38, -0.01). There was also a difference between the depersonalisation scores of the control condition and the clinical sample: the control condition reported significantly less depersonalisation than the clinical sample ($t(135)=2.08, p<0.05$). This difference represents a small effect size (*Hedges' \hat{g}* = -0.17, 95%CI: -0.36, 0.01). In comparison to a normal sample, the resilience condition had significantly higher levels of depersonalisation ($t(140)=2.34, p<0.05$). This difference represents a small effect size (*Hedges' \hat{g}* = 0.27, 95%CI: .10, 0.43). The control condition also had significantly greater depersonalisation compared to the normal sample ($t(135)=2.43, p<0.05$). This difference represents a small effect size (*Hedges' \hat{g}* = 0.30, 95%CI: .13, 0.46).

The resilience condition was found to be significantly lower in personal accomplishment compared to the clinical sample ($t(140)=-4.98, p<0.001$), and this represents a moderate effect size (*Hedges' \hat{g}* = 0.39, 95%CI: -0.64, -0.15). The control condition was found to be lower than the clinical sample to an even greater degree ($t(135)=-5.91, p<0.001$), with this difference representing a large effect size (*Hedges' \hat{g}* = -0.70, 95%CI: -0.89, -0.51). In comparison to the normal sample, the resilience condition reported significantly greater personal accomplishment ($t(140)=12.38, p<0.001$), and this represented a very large effect size (*Hedges' \hat{g}* = 1.35, 95%CI: 1.18, 1.52). The control condition also reported significantly greater personal accomplishment ($t(135)=7.99, p<0.001$), which was a very large effect size (*Hedges' \hat{g}* = 1.08, 95%CI: .91, 1.25).

Risk cut-off scores have been published for the MBI, which determine high, moderate and low risk levels for each of the three types of burnout (Maslach, et al., 1996). Therefore, the number of recruits in both the resilience and the control condition who reported high, moderate and low risk levels for each of the three types of burnout were determined (Table 6.20).

Table 6.20: Number and percentage of recruits who had low, moderate and high risk levels for each of the three types of burnout

	Resilience (n=141) N (%)	Control (n=136) N (%)
Emotional exhaustion		
Low risk (score range 0–16)	104 (73.8%)	102 (75.0%)
Moderate risk (17–26)	21 (14.9%)	23 (16.9%)
High risk (27–54)	16 (11.3%)	11 (8.1%)
Depersonalisation		
Low risk (0–6)	74 (52.5%)	70 (51.5%)
Moderate risk (7–12)	45 (31.9%)	44 (32.4%)
High risk (13–30)	22 (15.6%)	22 (16.2%)
Personal accomplishment		
Low risk (16–48)	139 (98.6%)	132 (97.1%)
Moderate risk (9–15)	2 (1.4%)	4 (2.9%)
High risk (0–8)	0 (0%)	0 (0%)

* $p<.05$

Pearson chi-square analyses revealed that there were no significant differences between the conditions for the low, medium and high risk levels, emotional exhaustion ($\chi^2(2)=.95, ns$), depersonalisation ($\chi^2(2)=.03, ns$) or personal accomplishment ($\chi^2(1)=.76, ns$).

Police services and external services access

There was a significant difference between the conditions for the degree to which police services were accessed. Those in the control condition accessed a significantly larger number of police services ($M=.49$, $SD=1.01$) compared to those in the resilience condition ($M=.21$, $SD=0.63$; $F(1,279)=8.16$, $p<0.01$), with this difference representing a small effect size (*Hedges' g* = $-.33$, 95%CI: -0.57 , -0.10).

There was also a significant difference between the conditions in the degree to which external services were accessed. Those in the control condition accessed a significantly larger number of external services ($M=.43$, $SD=1.11$) compared to those in the resilience condition ($M=0.13$, $SD=.34$) ($F(1,279)=8.97$, $p<0.01$), representing a small to moderate effect size (*Hedges' g* = -0.37 , 95%CI: -0.60 , -0.13).

Resilience across the three domains of resilience

Summary of results: Resilience across the three domains of resilience

An evaluation of the resilience training program found the following:

- There were no significant differences between the groups on any of the three individual domains of resilience (Health and Wellbeing, Reactivity to Trauma and Workplace Functioning), or for resilience across all three domains combined.
- The difference between the two groups for Workplace Functioning was, however, found to be almost significant: the experimental group demonstrated higher rates of resilience than the control group.
- Those in the control group considered the training handouts to be more helpful than those in the resilience group.
- Those in the resilience group reported greater satisfaction with the training, both at the post-training assessment, and at six-month follow-up.
- Satisfaction with the training of those in the resilience group decreased over time, while the satisfaction of the control group increased over time.

Analyses were conducted to determine the number of recruits from each of the two conditions who showed resilience across each of the three domains of resilience. For the Health and Wellbeing domain, resilience was defined as having no deterioration/improvement for affective distress, relationship satisfaction, substance involvement and general health. For the Reactivity to Trauma domain, resilience was defined as having a trauma score which was below 'Cut-off C' (a score of 23, as explained above) and within the normative sample distribution. For the Workplace Functioning domain, resilience was defined as having burnout scores within the low-risk range for at least two of the three domains of burnout, and not having accessed police help services or external help services. These results are shown in Table 6.21.

Table 6.21: Number of people who showed resilience for each of the three domains of resilience

	Health and Wellbeing ^{ab} N(%)	Reactivity to Trauma ^c N(%)	Workplace Functioning ^d N(%)	Resilience across all three domains N(%)
Resilience	65 (48.5%)	119 (100.0%)	89 (63.1%)	53 (37.9%)
Control	76 (56.7%)	110 (98.2%)	71 (51.8%)	46 (32.9%)

* $p<.05$, ^a No deterioration/improvement for the four measures of Health and Wellbeing (affective distress, relationship satisfaction, substance involvement, and general health); ^b only those who had responded for all four measures of Health and Wellbeing were included, $n=246$; ^c having a trauma score which was below Cut-off C and within the normative sample distribution, ^d having burnout scores which were within the low-risk range for at least two of the three domains of burnout, and not having accessed police help services or external help services

Chi-square analysis revealed that there were no significant differences between the conditions in any of the three individual domains of resilience, or for resilience across all three domains (combined). The difference between the two conditions for Workplace Functioning was, however, found to be approaching significance ($\chi^2(1)=3.63$, $p<0.06$). There was a trend for more people in the resilience condition to show resilience in this domain (defined as having burnout scores which were within the low-risk range for at least two of the three domains of burnout, and not having accessed police help services or external help services) as compared to those in the control condition.

Training elements

The following elements of the training programs (both resilience and control) were assessed at six-month follow-up: (1) how helpful people found the handouts, and (2) how helpful people found the handbook given to them upon completion of the training program (and mailed out again three months after training completion). Additionally, those in the resilience condition were asked (3) how often they had practised the breathing and muscle tension exercises they were taught during the training program.

A one-way ANOVA revealed that there was a significant difference between the resilience and control condition for how helpful they considered the handouts to be ($F(1,251)=6.93, p<0.01$). Those in the control condition considered the handouts to be more helpful than did those in the resilience condition. On average, the recruits considered the handouts to be 'a little' helpful ($M=2.34, SD=0.94$). There was no significant difference between the conditions in how helpful the handbook was considered to be ($F(1,250)=1.07, ns$), with the recruits on average considering the handbook to be 'a little' helpful ($M=2.31, SD=0.98$). Overall, those in the resilience condition reported that they practised the breathing and muscle tension exercises between 'not at all' and 'a little' ($M=1.39, SD=0.64$).

Intervention satisfaction

Participants were asked to rate their satisfaction with the content of the training program, as well as how important they felt the content was. Participants were asked to give ratings for each of the seven training modules that they received (resilience or control). Participants were also given an option of selecting that they could 'not remember' any given training module. Table 6.22 shows the number of people, at each time point (immediately after program, six-month follow-up), in each condition who could remember (a) all seven training modules, (b) only six training modules, (c) only five training modules, (d) only four training modules and (e) only three, two, one or no training modules.

Table 6.22: Number and Percentage of Recruits who could Remember Training modules

	Number of modules remembered	Resilience ^a N(%)	Control ^b N(%)
Immediately after program*	All 7 training modules	120 (85.1%)	109 (77.9%)
	6 training modules	10 (4.3%)	9 (6.4%)
	5 training modules	3 (2.1%)	12 (8.6%)
	4 training modules	2 (1.4%)	4 (2.9%)
	3, 2, 1 or 0 training modules	5 (3.5%)	0
Six-month follow-up*	All 7 training modules	104 (73.8%)	90 (64.3%)
	6 training modules	7 (5%)	14 (10.0%)
	5 training modules	13 (9.2%)	10 (7.1%)
	4 training modules	9 (6.4%)	5 (3.6%)
	3, 2, 1 or 0 training modules	6 (4.3%)	13 (9.3%)

* $p<0.05$; ^a $n=141$; ^b $n=140$

A Pearson chi-square analysis was used to assess whether there were any differences between the conditions for the memory for training modules at six-month follow-up. Due to small group sizes, an analysis was conducted comparing those who could remember: all seven training modules vs six modules vs five modules vs zero to four training modules. No significant difference was found between the two conditions for the numbers of people who could remember all seven modules, six modules, five modules, and zero to four modules ($\chi^2(3)=6.67, ns$), although this test was approaching significant ($p=0.08$).

A Pearson chi-square analysis was also used to assess whether there were any differences between the conditions in the memory for training modules at six-month follow-up. Once again, an analysis was conducted

comparing those who could remember all seven training modules vs six modules vs five modules vs zero to four training modules. The Pearson chi-square analysis showed that at six-month follow-up there was no significant difference between the conditions in memory of training modules ($\chi^2(3)=3.83$, *ns*).

A number of 2(Condition: resilience, control) x 2(Time: Immediately after program, six-month follow-up) repeated measures ANOVAs were performed to test the hypotheses that (a) there would be no difference in the level of participant satisfaction following participation in the training program (control or resilience) and (b) that there would be no difference between the conditions in the degree of importance that the participants placed upon the training content. Results were provided for those who could remember all seven training modules in Table 6.23.

Table 6.23: 2(Time) x 2(Condition) repeated measures ANOVAs for training satisfaction and degree of importance

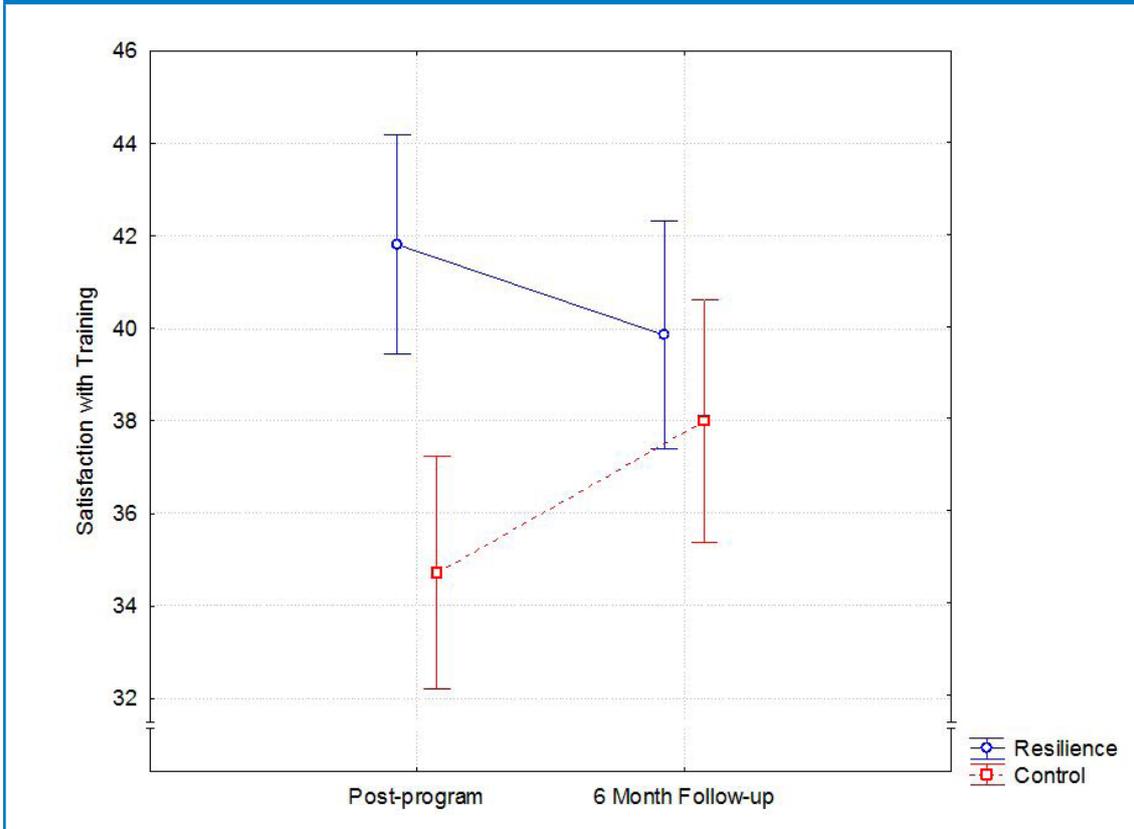
	Time		Analysis			
	Immediately after program M(SD)	Six-month follow-up M(SD)		(df) F	p	Hedges' \hat{g} (95% CI)
Satisfaction when all seven training modules could be remembered	38.50	38.98	T ¹	(1, 167) .52	ns	
	(11.88)	(11.82)	C ²	(1, 167) 8.48	p=.004**	.45 (.14, .75)
			T x C	(1, 167) 8.20	p=.005**	.44(.13, .75)
Importance when all seven training modules could be remembered	42.25	42.32	T ¹	(1, 163) 0.48	ns	
	(11.74)	(13.57)	C ²	(1, 163) 0.20	ns	
			T x C	(1, 163) 3.41	P<0.07	.29 (-.02, 0.6)

Note: ¹T' denotes Time; ²C' denotes Condition; * $p<0.05$; ** $p<0.01$

As can be seen from Table 6.23, a significant difference was found between the conditions for participant satisfaction ($F(1,167)=8.48$, $p<0.01$), with those in the resilience condition reporting greater satisfaction with the training both at the post-training assessment and at six-month follow-up.

An interaction was also found between Time and Condition for participant satisfaction ($F(1,167)=8.20$, $p<0.01$). At both time points the satisfaction of those in the resilience condition was greater than the satisfaction of those in the control condition. However, satisfaction of those in the resilience condition decreased over Time, while satisfaction of those in the control condition increased over time. This interaction is shown below in Figure 6.2. It appears regression to the mean over time may be at least partially responsible for this. There was no significant main effect for Time on satisfaction.

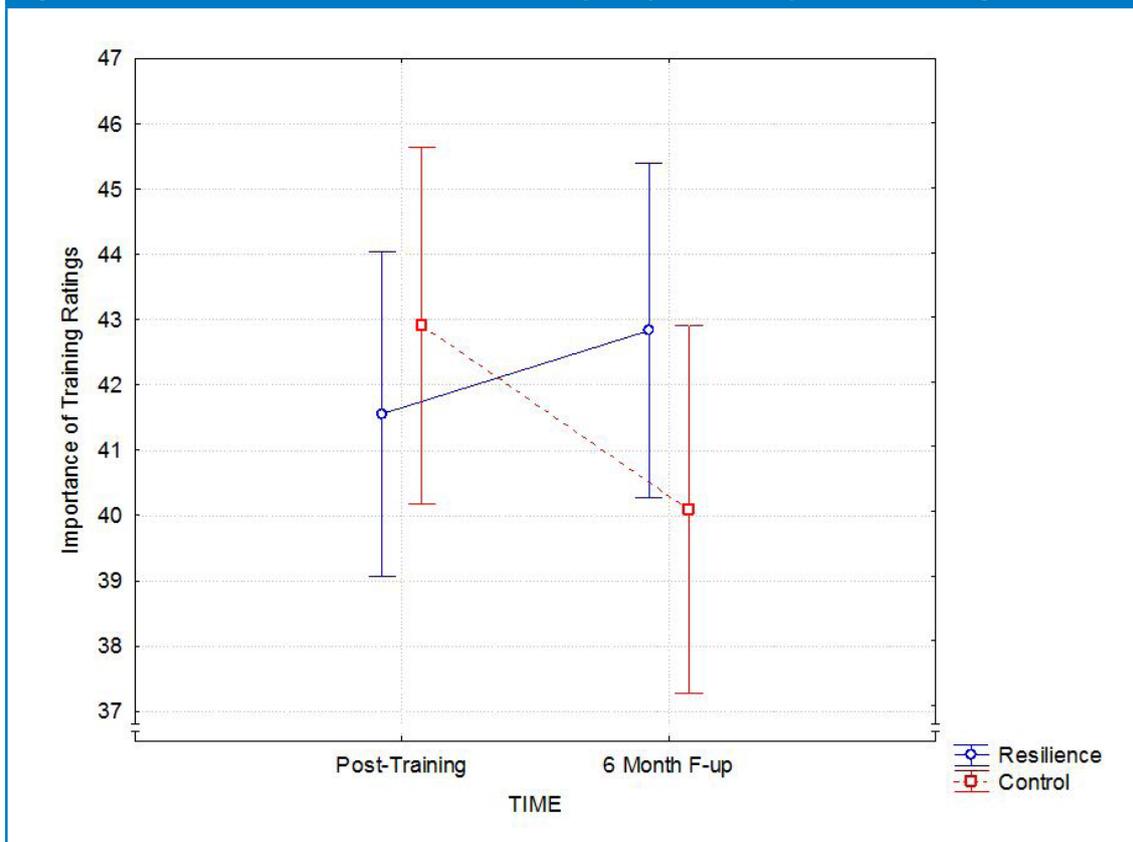
Figure 6.2: Interaction between Time and Condition for participant satisfaction



Note: Vertical bars denote 0.95 confidence intervals

For ratings of the importance of the training modules, the interaction between Time and Condition was found to be approaching significance ($F(1, 163)=3.41, p<0.07$). There was a trend for those in the resilience condition to consider the modules as more important over time, while those in the control condition considered the modules as less important over time, as demonstrated in Figure 6.3. There was no significant difference across Time for importance; nor was there a significant effect for Condition.

Figure 6.3: Interaction between Time and Condition for participant-rated importance of training



Part (c) To conduct a general exploration of the follow-up outcome variables

Summary of results: Part (c)

A general exploration of the outcome variables found the following:

- Six-month follow-up substance involvement correlated moderately with trauma symptomatology.
- The resilience group found the training to be more credible than those in the control group, and had greater expectancy of the training.

Trauma symptomatology and alcohol and drug use

Six-month follow-up substance involvement was found to correlate moderately with trauma symptomatology ($R_{(5)}=0.23$, $p<0.05$). Those with higher substance involvement scores were more likely to have high trauma symptomatology scores. Pre-program substance involvement was not found to correlate with trauma symptomatology ($R_{(5)}=0.03$, ns).

Credibility/expectancy and resilience

One-way ANOVAs (two-tailed) were conducted to determine whether there were any differences between the two conditions for credibility or expectancy as measured immediately after the program. The resilience condition found the training significantly more credible ($M=.55$, $SD=3.43$) than did the control condition ($M=-.49$, $SD=3.40$; $F(1,268)=6.23$, $p<0.02$, Hedges' $\hat{g}=0.30$). Similarly, the resilience condition had greater expectancy ($M=.31$, $SD=1.89$) than the control condition ($M=-.23$, $SD=1.93$; $F(1,268)=5.46$, $p=0.02$, Hedges' $\hat{g}=0.29$).

A correlation analysis (two-tailed) was used to assess the degree to which credibility and expectancy were related to: affective distress, relationship satisfaction, substance involvement, general health, trauma symptomatology, and the three types of burnout (emotional exhaustion, depersonalisation, personal accomplishment) at six-month follow-up. A small correlation was found between credibility and depersonalisation ($R_{(p)} = -.18, p < 0.01$), with those who rated the intervention as more credible reporting less depersonalisation at six-month follow-up. A small correlation was also found between credibility and personal accomplishment ($R_{(p)} = .14, p < 0.05$), with those who rated the intervention as more credible reporting greater feelings of personal accomplishment.

A small correlation was found between credibility and affective distress ($R_{(s)} = .13, p < 0.05$), with those who found the training more credible experiencing slightly higher levels of affective distress. Expectancy correlated with depersonalisation to a small degree ($R_{(p)} = -.23, p < 0.01$), with those with greater expectancy having lower depersonalisation. Credibility and expectancy were not found to significantly correlate with any of the other major variables.

Part (d) Analysis of the 12-month follow-up subgroup data

Summary of results: Part (d)

An evaluation of the 12-month follow-up subgroup data found:

- 49.4% of all participants met criteria for substance involvement use/abuse or abuse/dependence.
- 61.8% of participants met criteria for alcohol use/abuse or abuse/dependence.
- The majority of participants (80%) reported good health.
- Participants in both conditions had very low levels of trauma symptomatology.
- One member of the control condition met criteria for PTSD at 12-month follow-up.

Analyses of 12-month follow-up data were conducted for a subgroup of 92 participants. Further data collection from the sample at this time point was not made possible. This sample is presented to gauge the direction of results over time to aid a longer term follow-up. The group comprised 42 males and 50 females, with 45 officers in the resilience condition and 47 officers in the control condition. Due to the limited numbers in the 12-month follow-up group, these analyses are considered exploratory. The real test of resilience can only be achieved with a full dataset at a longer follow-up.

Due to the presence of high scores within the affective distress and trauma symptomatology scores, a non-parametric test (ie Mann-Whitney U test) was used to assess any between-condition differences for these variables.

Health and Wellbeing at 12-month follow-up

To explore any between-condition differences for the Health and Wellbeing domain of resilience at 12-month follow-up, a number of one-way ANOVAs were performed. The results are presented in Table 6.24.

Table 6.24: One-way ANOVAs for the domain of Health and Wellbeing at 12-month follow-up

	Condition		Analysis		
	Resilience M(SD)	Control M(SD)	(df) F	p	Hedges' \hat{g} (95% CI)
Substance involvement	19.36(13.19)	17.39(12.54)	F(1,87)=0.52	ns	
General health	86.07(12.13)	85.60(11.95)	F(1,88)=0.03	ns	
Relationship satisfaction	26.49 (4.04)	25.17 (6.18)	F(1,87)=1.39	ns	

* $p < .05$

Due to the presence of three high scores for affective distress (scores that were deemed to be accurate) a Mann-Whitney U test was used to determine whether there were any between-condition differences for affective distress. Although there was a trend for those in the resilience condition ($M=7.73$, $SD=9.33$) to have lower levels of affective distress than those in the control condition ($M=14.60$, $SD=22.73$), this difference was not significant because of the smaller than planned for sample size ($U(1)=920$, $z=-1.09$, ns). However, if the effect size of the difference between groups (Hedges' $g = 0.4$) was to hold constant for our originally planned 280 participants, this result would have reached significance with 99.99 per cent confidence.

As shown in Table 6.24, there were no significant differences between the conditions for substance involvement, general health or relationship satisfaction. However, again, relationship satisfaction would have been significantly higher in the resilience group had our originally planned sample size been available for analysis (Hedges' $\hat{g} = 0.23$).

Substance involvement

A chi-square analysis was performed to determine the number of recruits in both the resilience and the control condition who reported substance involvement at 12-month follow-up that was at (a) below risk level, (b) use/abuse level or (b) abuse/dependence level (see Table 6.25).

	12-month follow-up		
	Resilience (n=45) N(%)	Control (n=44) N(%)	Total sample (n=89) N(%)
Total substance involvement			
Below risk level	21 (46.7%)	24 (54.5%)	45 (50.6%)
Met criteria for use/abuse (Cut-off score=15.0)	19 (42.2%)	17 (38.6%)	36 (40.4%)
Met criteria for abuse/dependence (Cut-off score=39.50)	5 (11.1%)	3 (6.8%)	8 (9.0%)
Alcohol Involvement			
Below risk level	16 (35.6%)	18 (40.9%)	34 (38.2%)
Met criteria for use/abuse (cut-off score=4.5)	22 (48.9%)	17 (38.6%)	39 (43.8%)
Met criteria for abuse/dependence (cut-off score=10.5)	7 (15.6%)	9 (20.5%)	16 (18.0%)

As can be seen in Table 6.25, no significant differences were found between the resilience and control conditions for the number of recruits who met use/abuse criteria for substance involvement at 12-month follow-up.

Similarly, no significant difference was found between the resilience and control conditions for the number of recruits who had below risk level, use/abuse criteria or abuse/dependence criteria alcohol involvement scores at 12-month follow-up.

Overall, at 12-month follow-up, 49.4 per cent of all participants met criteria for substance involvement use/abuse or abuse/dependence, and 61.8 per cent of participants met criteria for alcohol use/abuse or abuse/dependence.

Further analysis for alcohol involvement was conducted in order to assess whether there were any significant differences between the two conditions. A one-way ANOVA showed no significant difference between the conditions ($F(1,87)=0.21$, ns).

General health

As described earlier (and shown in Table 6.24), a one-way ANOVA showed that there was no significant difference between the conditions for general health at 12-month follow-up ($F(1,88)=0.03, ns$).

Participants' general health scores were divided into two categories: those with general health scores between 80 and 99; and those with scores between 1 and 79. Scores of between 80 and 99 were considered to be reflective of good general health, while scores of between 1 and 79 were considered reflective of poor general health. The number of participants with scores in these categories, for each of the conditions, is shown below in Table 6.26. A Pearson chi-square analysis revealed that there were no significant differences between the numbers of participants in each of the categories at 12-month follow-up ($\chi^2(1)=1.35, ns$).

Table 6.26: Number of participants in the resilience and the control conditions, with good general health scores and poor general health scores at 12-month follow-up

General health (SF-36 total score) range	12-month follow-up		Total N(%) (n=90)
	Resilience N(%) (n=44)	Control N(%) (n=46)	
Good: 80–99.99	33 (75%)	39 (84.8%)	72 (80%)
Poor: 1–79.99	11 (25%)	7 (15.2%)	18 (20%)

Reactivity to trauma at 12-month follow-up

A one-way ANOVA revealed that at 12-month follow-up there was no significant difference between the two conditions for the number of policing incidents that the recruits rated as having caused 'distress at the time' of the event (events for which distress at the time was rated 3 or greater) ($F(1, 75)=0.95, ns$).

Trauma symptomatology

A Mann-Whitney U test was performed to determine whether there were any differences between the resilience and the control condition for trauma symptomatology at 12-month follow-up. No significant difference in trauma symptomatology was found between the two conditions ($U(1)=639, z=-0.84, ns$). Participants in the resilience condition had very low levels of trauma symptomatology ($M=1.38, SD=2.41$), as did those in the control condition ($M=2.69, SD=5.19$). Displaying a possible small to moderate effect size (*Hedges' g* = 0.32) in favour of the resilience group, this difference would have reached significance (had the differences remained the same) if the full sample been assessed.

One member of the control condition was found to meet criteria for PTSD at 12-month follow-up. While three participants scored into double figures on the trauma questionnaire in the control group, only one did in the resilience group.

The number of recruits who fell within certain clinical classifications was calculated for each condition. Table 6.27 shows the number of recruits with scores below Cut-off C for the Reactivity to Trauma domain at the 12-month follow-up assessment.

Table 6.27: Number and percentage of recruits who were below 'Cut-off C' in the domain of Reactivity to Trauma at 12-month follow-up

	Trauma symptomatology at 12-month follow-up
	N(%) (Cut-off C=23.36)
Resilience (n=40)	40 (100.0%)
Control (n=36)	35 (97.2%)

All recruits from the resilience condition had trauma symptomatology scores below Cut-off C, meaning that all of the groups' scores were towards the normative mean. One person from the control condition had a score which was greater than Cut-off C, and which was towards the clinical mean.

Relationship between traumatic events and trauma symptoms

As with the six-month follow-up data, we analysed the relationship between stressor events and trauma symptoms. The same kind of profile emerged as at six months. As can be seen in Table 6.28, there was a significant relationship overall between trauma symptoms and the number of critical events experienced, the number of different critical events and the number of events rated as somewhat distressing or greater. However, as with the six-month follow-up data, this pattern did not also occur within both conditions.

Again, the resilience condition displayed a significant correlation between the number of experienced events ranked greater than 2 and trauma symptomatology, but now with the number of events in total or the number of different events experienced. To the contrary, the control group again showed a strong relationship between trauma symptomatology and events experienced. It appears that the resilience training may well have disrupted the relationship between stressors and symptoms.

Table 6.28: Relationship between trauma exposure and trauma symptomatology using Spearman Rank correlations at 12 month follow-up

	Trauma exposure		
	Nº of critical events	Nº of different events	Events rated >2
All conditions Trauma symptomatology	$R_{(s)} = -0.26$, N=76, $p < 0.03$	$R_{(s)} = -0.30$, N=76, $p < 0.009$	$R_{(s)} = -0.49$, N=72, $p < 0.001$
Control Trauma symptomatology	$R_{(s)} = -0.41$, N=36, $p < 0.02$	$R_{(s)} = -0.34$, N=36, $p < 0.05$	$R_{(s)} = -0.59$, N=33, $p < 0.001$
Resilience Trauma symptomatology	$R_{(s)} = -0.13$, N=40, $p = 0.42$	$R_{(s)} = -0.25$, N=40, $p = 0.13$	$R_{(s)} = -0.41$, N=39, $p < 0.009$

Workplace Functioning at 12-month follow-up

Burnout

Three one-way ANOVAs were performed to determine whether there were any differences between the resilience and the control conditions for each of the three burnout subscales (emotional exhaustion, depersonalisation and personal accomplishment). No significant differences were found between the conditions for emotional exhaustion ($F(1,86)=1.72$, *ns*), depersonalisation ($F(1,86)=0.65$, *ns*) or personal accomplishment ($F(1,86)=0.01$, *ns*). The means and standard deviations of the three types of burnout, for each of the two conditions, are shown in Table 6.29. F values over 1 are required to be reported by many top-tier journals because of the possibility of an underpowered effect. As with the previous data, if a full complement of participants had been acquired, emotional exhaustion would have reached significance ($p < 0.02$).

Table 6.29: Means and standard deviations for each of the three types of burnout, for the resilience and control condition at 12-month follow-up

	Resilience (n=43) M(SD)	Control (n=45) M(SD)
Emotional exhaustion	12.67 (10.03)	15.76 (11.87)
Depersonalisation	7.33 (6.04)	8.49 (7.33)
Personal accomplishment	34.16 (9.15)	33.98 (8.83)

Risk cut-off scores have been published for the MBI that determine high, moderate and low risk levels for each of the three types of burnout (Maslach, et al., 1996). Therefore, a chi-square analysis was performed to determine the number of recruits in both the resilience condition and the control condition who reported high, moderate and low risk levels for each of the three types of burnout. Table 6.30 shows the number of recruits in each of the two conditions who had low, moderate and high risk levels for each of the three types of burnout.

Table 6.30: Number and percentage of recruits who had low, moderate and high risk levels for each of the three types of burnout at 12-month follow-up

	Resilience (n=43) N (%)	Control (n=45) N (%)
Emotional exhaustion		
Low risk (score range 0–16)	28 (65.1%)	26 (57.8%)
Moderate risk (17–26)	10 (23.3%)	11 (24.4%)
High risk (27–54)	5 (11.6%)	8 (8.1%)
Depersonalisation		
Low risk (0–6)	26 (60.5%)	23 (51.1%)
Moderate risk (7–12)	9 (20.9%)	10 (22.2%)
High risk (13–30)	8 (18.6%)	12 (26.7%)
Personal accomplishment		
Low risk (16–48)	40 (93%)	44 (97.8%)
Moderate risk (9–15)	3 (7%)	0 (0%)
High risk (0–8)	0 (0%)	1 (2.2%)

* $p < .05$

Pearson chi-square analyses revealed that there were no significant differences between the conditions, for the low, medium and high risk levels, for emotional exhaustion ($\chi^2(2)=0.77$, *ns*), depersonalisation ($\chi^2(2)=0.99$, *ns*) or personal accomplishment ($\chi^2(2)=4.15$, *ns*).

Police services and external services access

There were no significant differences between the conditions for the degree to which police services were accessed in the preceding six-months ($F(1,89)=2.56$, *ns*). There was also no significant difference between the conditions for the degree to which external services were accessed in the preceding six-months ($F(1,87)=2.08$, *ns*). Again, an F value of over 1 for both analyses warrants further inspection. Both would have been significant if the trends had continued, but in different directions. The control group accessed more police services than the resilience group, but the resilience group accessed more external services than the control group.

Trauma symptomatology and alcohol and drug use at 12-month follow-up

Twelve-month follow-up substance involvement was found to significantly correlate with trauma symptomatology, displaying a large effect size ($R_{(3)}=0.33$, $p < 0.01$). Those with higher substance involvement scores were more likely to have high trauma symptomatology scores.

Chapter 6: Synthesis and recommendations

This study was the first ever randomised controlled trial of resilience training for emergency services personnel. The goal was to assess the impact of this training in relation to Health and Wellbeing, Reactivity to Trauma and Workplace Functioning. Originally the full dataset was to be collected to 12-month follow-up, but only a subsample was collected to this time point. This chapter brings together what has been learnt from the analyses described above and makes recommendations for moving forward. In essence, a complete long-term follow-up—accessing the full cohort of participants—is warranted.

Major findings

The results of the analyses showed that overall there was no significant difference between the two conditions for resilience across all three domains at six-months. There was a non-significant trend, however, for those who received resilience training to be more likely to show no deterioration or an improvement in Workplace Functioning at six-month follow-up. Those in the resilience condition reported greater satisfaction with the training both at the post-training assessment and at six-month follow-up. Over time, however, the satisfaction of those in the resilience condition decreased, while the satisfaction of those in the control condition increased. We suggest regression to the mean as an explanation.

For the Reactivity to Trauma domain all recruits except two showed resilience, indicating that resilience in this domain is the norm. No significant differences were found between the conditions for drug and alcohol usage at follow-up. Resilience training was not found to have any statistically significant beneficial effects. However, considering the small sample size at 12-month follow-up and the possible moderate effect size of intervention, it is likely that the effects of this resilience training will be most evident when a full follow-up is permitted and at a time point further down the line. It should be noted that others in the field have noted that short follow-ups can sometimes make it difficult to detect effects of any kind (eg Guthrie & Bryant, 2005). Such longer term assessments of full cohorts would also address duty of care responsibilities for police service employees.

The relationship between the primary outcome variables and pre-program attributes

Breaking the global results down further, age was found to significantly correlate with depersonalisation, with older recruits having higher levels of depersonalisation. Older participants were also found to have lower levels of affective distress at six-month follow-up than younger participants. A significant relationship was also found between age and police services access, with older participants accessing a greater number of police services than younger participants.

There was a significant relationship between gender and personal accomplishment: males had significantly higher levels of personal accomplishment at six-month follow-up compared to females. No relationship was found between gender and affective distress or trauma symptomatology. This finding is in line with studies by both Carlier and colleagues (1997), and Hodgins and colleagues (2001), which found no relationship between gender and posttraumatic stress symptoms for police officers.

Those in a relationship at the pre-program assessment were found to have significantly higher levels of general health and personal accomplishment, and lower levels of substance involvement. Single recruits had significantly higher levels of affective distress and trauma symptomatology than those in a relationship.

Those at city stations experienced significantly higher levels of emotional exhaustion and depersonalisation. However, those in country stations reported significantly higher levels of affective distress than those in metropolitan stations.

The CD-RISC is a resilience measure that has previously been found to relate to trauma symptomatology. An examination of survivors of violent trauma found that those who scored more highly on the CD-RISC had less posttraumatic symptomatology and better general health than those with low scores (Connor, Davidson, & Lee, 2003). This finding was partially replicated for the current study. Resilience as measured by the CD-RISC was found to correlate with general health, and higher resilience scores on the CD-RISC to correlate with higher general health scores. CD-RISC score correlated with affective distress: higher resilience scores on the CD-RISC correlated with lower affective distress scores. CD-RISC score also correlated with relationship satisfaction, with greater relationship satisfaction correlating with higher CD-RISC score. However, CD-RISC score was not found to be related to posttraumatic symptomatology.

CD-RISC scores were found to correlate with all three types of burnout (depersonalisation, emotional exhaustion and personal accomplishment), with high scores on the CD-RISC found to be related to high levels of personal accomplishment, low levels of emotional exhaustion and low levels of depersonalisation. These results suggest that the CD-RISC may, in fact, to some degree be measuring burnout.

Currently, no study has been published that has examined the relationship between the CD-RISC and the MBI, or whether the CD-RISC has acceptable content validity. Future research should be directed in this area to ensure that the CD-RISC is in fact evaluating the domains that are claimed to be measured. This is recommended in light of previous research that found trauma measures to actually be a better predictor of burnout in the workplace than measures of post-trauma functioning (Devilly, Wright, & Varker, 2009).

Neuroticism (emotional instability) was found to be associated with general health, affective distress, substance involvement, relationship satisfaction, emotional exhaustion and personal accomplishment at six-month follow-up. For each of these relationships, lower neuroticism scores were correlated with more positive outcomes. No relationship was found between neuroticism and posttraumatic distress. This finding is in contrast to the large number of studies finding a link between these two factors (eg Breslau, et al., 1991; Charlton & Thompson, 1996; Davidson, et al., 1987).

The finding for the current study may be explained by the fact that the vast majority of participants reported extremely low levels of PTSD symptomatology, and many participants reported no trauma symptoms at all. It is most likely that the link between neuroticism and trauma symptomatology is only evident when trauma symptoms are at a detectable level.

Higher levels of optimism correlated with lower levels of affective distress, depersonalisation and emotional exhaustion at six-month follow-up. Those with higher levels of optimism also had higher levels of personal accomplishment. This finding is congruent with the existing literature linking optimism to a variety of positive outcomes, including faster recovery from surgery (Fitzgerald, et al., 1993; Scheier, et al., 1989), lower illness burden after natural disaster (Costello, 1998), less distress and fewer HIV-related concerns in gay men (Taylor, et al., 1992) and less distress in women following a failed IVF attempt (Litt, et al., 1992).

Trait anger was found to correlate significantly with general health, affective distress, emotional exhaustion, depersonalisation and personal accomplishment. A higher level of trait anger was associated with poorer outcome for each of these variables at six-month follow-up. No association was found between trauma symptoms and anger.

Perceived social support was found to correlate with all three types of burnout: depersonalisation, emotional exhaustion and personal accomplishment. Those who reported higher levels of social support reported lower levels of depersonalisation and emotional exhaustion, and higher levels of personal accomplishment. This finding is consistent with a number of other studies that found perceived social support to be negatively related to burnout (eg N. C. Brown, Prashantham, & Abbott, 2003; Greenglass, Fiksenbaum, & Burke, 1994; Koniarek & Dudek, 1996).

Perceived social support was found to correlate significantly with general health, affective distress, relationship satisfaction, and trauma symptomatology at six-month follow-up. This finding is consistent with the emergency services personnel trauma literature, which has found a robust relationship between poor, or few, social supports and trauma symptoms (Carlier, et al., 1997; Regehr, et al., 2000; Stephens, 1996).

Evaluation of the resilience training program

Overall, 37.9 per cent of those in the resilience condition and 32.9 per cent of those in the control condition were found to be resilient across all three domains of resilience (Health and Wellbeing, Reactivity to Trauma, and Workplace Functioning).

Health and Wellbeing

The domain of Health and Wellbeing was assessed by the four factors of affective distress, substance involvement, relationship satisfaction and general health. Overall, there was no significant difference between the resilience and control conditions for resilience for the Health and Wellbeing domain. Approximately half of the recruits demonstrated resilience in this domain (48.5% for the resilience condition, 56.7% for the control condition). Each of the four factors that comprised Health and Wellbeing are discussed in greater detail below.

No significant difference was found between the conditions for affective distress. The majority of recruits in both the resilience and control conditions exhibited either no change or an improvement in their levels of affective distress at follow-up, compared to the pre-program assessment. There was a significant decrease in level of affective distress over time, irrespective of condition. Overall, however, levels of affective distress were low at the pre-program assessment and remained low at six-month follow-up.

The conditions were not found to differ significantly in relationship satisfaction at six-month follow-up. Participants reported high relationship satisfaction at the pre-program assessment, and relationship satisfaction remained high across the two conditions at the follow-up assessment.

In terms of substance involvement, no significant difference was found between the resilience and the control condition at six-month follow-up. However, it should be noted that at the pre-program assessment there was a significant difference between the resilience and the control condition, with a higher percentage of the resilience condition members meeting criteria for total substance involvement use/abuse as compared to the control condition. At six-month follow-up, the percentage of people in the control condition who met criteria for total substance involvement use/abuse was approximately equal to the percentage of people in the resilience condition, meaning that the level of total substance involvement use/abuse increased at a greater level over time for those in the control condition.

No significant differences were found between the resilience and the control conditions for levels of alcohol involvement. At six-month follow-up there was a higher percentage of people in the resilience training condition who demonstrated no change/improvement in their substance involvement in comparison to the control condition, but this difference was not significant.

At six-month follow-up, 51.2 per cent of all participants reported total substance involvement scores which were at risk level (for either substance use/abuse or abuse/dependence), and 56.6 per cent of participants reported alcohol involvement scores which were at risk level (for either alcohol use/abuse or abuse/dependence). These findings support previous research showing a strong normalisation of alcohol consumption within the police service, and that police officers are more likely to drink alcohol at risk levels than members of the general public (eg Davey, et al., 2001; McNeill & Wilson, 1993).

The rates of alcohol consumption for the current study are comparable to a study of NSW police officers, which found 48 per cent of policemen and 40 per cent of policewomen consumed alcohol excessively (Richmond, et al., 1998). The figures reported in the current study are considerably higher than those for the general Australian population, with a 2007 National Drug Strategy survey of households finding that

approximately 10.3 per cent of the population consumes alcohol in a way that is considered risky in the long term (Australian Institute of Health and Welfare, 2008).

Research of Queensland Police by Rallings (2000) found that hazardous drinking rates increased from 13 per cent to 22 per cent after commencement of police work. In a later replication study with Queensland new recruits, Rallings, Martin and Davey (2005) found a significant increase in the quantity and frequency of alcohol consumption from the time officers undertook initial training to when they had completed 12 months of operational duties. The percentage of officers who drank more frequently than once a month increased from 47 per cent to 60 per cent, and the percentage of officers who reported consuming six or more drinks once a month increased from 25 per cent to 32 per cent. These findings were replicated in the current study, with the percentage of recruits who drank alcohol at a risky level increasing from 31.8 per cent at the pre-program assessment, to 56.6 per cent at the six-month follow-up. These findings suggest that working as a police officer has a direct impact upon an individual's substance involvement and alcohol consumption.

Across conditions, 80.75 per cent of recruits reported good general health at six-month follow-up, and general health was found to increase significantly over time, irrespective of condition. There was a trend for the general health of those in the resilience condition to be lower at the pre-program assessment than the general health of those in the control condition. At the follow-up assessment the general health of the resilience condition increased, and the general health of the control condition remained relatively static, to a point where both conditions had approximately equal levels of general health at the six-month follow-up assessment. This interaction was not significant, however; nor was the difference between the two conditions at the pre-program assessment.

As discussed previously, both the control condition and the resilience condition reported very low levels of affective distress (as measured by indices of stress, anxiety and depression) at both the pre-program assessment and at follow-up. Given that there are strong links between stress, anxiety and depression (affective distress), and physical ill health (L. R. Martin, et al., 1995; Rice, 1999), it is logical that those reporting low levels of affective distress would also report good levels of general health.

Reactivity to Trauma

The Reactivity to Trauma domain was only assessed at the follow-up time point, due to the fact that it could only be assessed once the recruits had had the opportunity to be exposed to potentially traumatic policing events. Preliminary analyses showed that there were no significant differences between the conditions in the number of different types of policing critical incidents that they were exposed to; nor was there a significant difference in the number of policing incidents rated as causing significant 'distress at the time'. This indicates that both conditions were exposed to policing trauma in a similar way. Analyses revealed that there were no significant differences between the conditions in the level of trauma symptomatology and that both conditions reported extremely low levels of trauma symptomatology, with many recruits reporting no trauma symptoms at all.

Clinical classification scores were calculated in order to assess the number of people above the clinical cut-off for trauma symptomatology and the number of people below the cut-off. It was found that all recruits in the sample except two (people from the control condition) obtained trauma symptomatology scores below the clinical cut-off. That means that all but two participants demonstrated resilience for the Reactivity to Trauma domain. This finding adds support to recent research suggesting that resilience, when considered in terms of a lack of trauma symptoms following exposure to a traumatic event, may be the norm rather than the exception.

For example, in a study of September 11 survivors by Bonanno and colleagues (2006), resilience was considered to be having 0 or 1 PTSD symptom following exposure to the events of September 11. Using this definition, 65.1 per cent of participants (where n=2,752) were found to be resilient. In the current study, not all participants were exposed to a traumatic policing event, although it was the case for the majority (87.2%). Of those exposed to a traumatic event, approximately half (49%) rated the event as causing significant distress

at the time. Yet of these people only two reported trauma symptoms at a level to meet criteria for PTSD. This finding supports the notion of resilience—in terms of trauma symptoms—being ‘ordinary magic’ (Masten, 2001) and replicates findings by those such as Bonanno and colleagues (2007), who found that the majority of people who are exposed to a traumatic incident do not go on to report trauma symptoms.

Of particular interest was the relationship between stressor exposure and trauma symptomatology. Our intervention was primarily aimed at providing serial approximation to traumatic events and desensitising the recruits to the ‘slings and arrows’ of police duty. Our results showed that, while there remained a strong positive relationship between stressors and symptoms for the control condition, this was greatly reduced or eradicated for the resilience condition. This would suggest that we have, at least, disrupted the relationship between stressor and symptom and would therefore expect trauma effects to become more apparent in the longer term.

Workplace Functioning

The domain of Workplace Functioning was measured in terms of burnout (emotional exhaustion, depersonalisation and personal accomplishment) and access to police and external help services. Burnout and access to services were only measured at follow-up, as these factors would be relevant and meaningful only after the recruits had been working as police officers for six months. Recruits were considered resilient in the domain of Workplace Functioning if they reported low-risk levels for at least two out of the three domains of burnout, and if they had not accessed police or external help services in the preceding six months. No significant difference was found between the two conditions for the domain of Workplace Functioning.

When the resilience and the control conditions were compared to both a clinical and a normative sample, both the resilience and the control conditions were found to have significantly lower levels of emotional exhaustion in comparison to the clinical sample, with the resilience condition having lower levels to a greater degree than the control condition. Those in the resilience condition also had significantly lower levels of emotional exhaustion in comparison to a normal sample.

For depersonalisation, both those in the resilience and those in the control conditions scored significantly lower than the clinical sample. In contrast, both the control condition and the resilience condition had significantly greater depersonalisation in comparison to the normative sample.

Both the resilience and control conditions were found to be significantly lower in personal accomplishment in comparison to the clinical sample, with the control condition reporting scores which were lower than the clinical sample to a greater degree than the resilience condition. Both the resilience and the control conditions reported significantly greater personal accomplishment than the normal sample.

Comparisons were made between the resilience condition and the control condition, using previously published risk cut-off scores, for each of the three domains of burnout. No significant differences were found between the two conditions for any of these domains.

The degree to which police services and external services were accessed in the preceding six months was also assessed. Those in the control condition were found to have accessed police services to a significantly greater degree than those in the resilience condition. There was also a significant difference between the conditions for the degree to which external services were accessed. Those in the control condition accessed a greater number of external services than those in the resilience condition.

These results suggest that those recruits who were provided with the resilience training may have learnt important skills and strategies that helped them to deal with workplace stress, which in turn led to a significantly lower degree of seeking police and external help services. These results may indicate that, rather than needing to seek professional advice, the recruits in the resilience condition were able to deal with problems on their own using the coping strategies that they were taught—or they talked to friends, family and colleagues to receive help and advice in dealing with any stressors or problems that they may have faced.

Alternatively, help-seeking behaviours may actually reflect good adjustment, and not seeking help may lead to poor outcomes in the longer term. This can only be assessed by a longer term assessment of outcomes in years rather than months. This is demonstrated quite clearly in the 12-month follow-up, which produced conflicting results (albeit based on a small number of participants). For now, we can only know that there is a short-term improved cost benefit for resilience training, in comparison to training as normal, through fewer help services being accessed.

In a study of resilience in physicians, Keeton, Fenner, Johnson and Hayward (2007) reverse-scored the emotional exhaustion domain of burnout, renamed it 'emotional resilience' and claimed that high levels of emotional exhaustion were representative of low levels of resilience. Although this approach has not been replicated by other researchers (and is not being advocated here), it does raise the question of whether resilience as conceptualised by some researchers may not in fact be representative of low levels of burnout. In the current study, high correlations were found between the CD-RISC measure of resilience and burnout, adding support to this argument.

Resilience across the three domains

When resilience was measured across a number of domains, the picture changed with the majority of recruits failing to display resilience for the domains of Health and Wellbeing and Workplace Functioning. Only approximately one-third of recruits in the resilience condition (37.9%) and one-third of those in the control condition (32.9%) showed resilience across all three domains of resilience. In areas such as affective distress, substance involvement, relationship satisfaction, general health, burnout and use of help services, the majority of recruits were shown overall to have deteriorated when their responses were compared to the responses given six months earlier, before they began working as police officers. This finding is consistent with the theory of Layne and colleagues (2007), who suggest that resilience is a multidimensional process and that an individual can display resilience in one domain and be non-resilient in another.

There was a significant difference between the conditions for how helpful they considered the training handouts to be, with those in the control condition considering the handouts to be more helpful than those in the resilience condition. There was no significant difference between the conditions in how helpful they considered the handbook to be, and those in the resilience condition reported that they practised the breathing and muscle exercises they were taught only to a very small degree.

There was no significant difference between the conditions in memory of the training modules, both immediately after the end of the training program and at six-month follow-up, although at both time points there was a non-significant trend for those in the resilience condition to have greater memory for the training content.

Intervention satisfaction

An assessment of participant satisfaction with the training content showed that those in the resilience condition had greater satisfaction with the training both at the post-training assessment and at six-month follow-up.

There was also a significant interaction between Time and Condition for participant satisfaction. At both time points, the satisfaction of those in the resilience condition was greater than the satisfaction of those in the control condition. However, satisfaction of those in the resilience condition decreased over time, while satisfaction of those in the control condition increased over time.

Similarly, and as would be expected given the findings for satisfaction, an interaction that was approaching significance ($p=0.05$) was found for the importance of the training content. Immediately after completion of the training program, those in both the resilience condition and control condition rated the importance of the training content approximately equally. However, at follow-up those in the resilience condition increased their rating of importance of the training, while those in the control condition decreased their importance

rating. This result suggests that, once the recruits had been working for six months, those in the resilience condition realised (or at least 'rated') the importance of the training in light of their working experience. Those in the control condition did not consider the training they received to be as important once they were able to consider it in relation to their policing experience.

General exploration of the outcome variables

A significant relationship was found between trauma symptomatology and substance involvement (alcohol and drug use) at six-month follow-up, with those with higher substance involvement scores more likely to have higher trauma symptomatology. No relationship was found between pre-program substance involvement and follow-up trauma symptomatology. These findings add to the body of evidence suggesting that drugs and alcohol are used to self-medicate trauma symptoms (eg Davidson, et al., 1991; Kessler, et al., 1995; Reed, et al., 2007).

Significant differences were found between the two conditions in credibility and expectancy. Those in the resilience condition found the training to be significantly more credible than those in the control condition. They also had significantly greater expectancy than those in the control condition. Those who found the intervention more credible immediately after the program were found to report significantly lower levels of depersonalisation at six-month follow-up. Those who rated the intervention as more credible immediately after the program reported greater feelings of personal accomplishment at six-month follow-up.

A small correlation was also found between credibility and affective distress: those who found the training more credible experienced slightly higher levels of affective distress. Expectancy correlated with depersonalisation to a small degree, with those with greater expectancy having lower depersonalisation. Credibility and expectancy were not found to significantly correlate with any of the other major variables.

12-month follow-up subgroup

Exploratory analyses of 12-month follow-up data for a subgroup of 92 participants showed that some of the key findings from the six-month follow-up analyses persisted over time and that on other, important, indices the effects became more marked.

Within the domain of Health and Wellbeing there were no significant differences between the conditions for affective distress, relationship satisfaction, substance involvement and general health. However, if a full dataset had been collected, as planned, and the effect size differences were maintained, then there would have been significant differences in affective distress and relationship satisfaction—with the resilience-trained group being lower on affective distress and higher on relationship satisfaction. Likewise, there was no significant difference within the domain of Workplace Functioning ($p < 0.05$). However, if the full sample had been assessed and the trend maintained, there would have been significant differences in the domain of workplace burnout, with emotional exhaustion being lower in the resilience group.

There were also no significant differences between the conditions for Reactivity to Trauma. However, as with the other indices, means displayed a trend for resilience superiority. Had a full complement of subjects been obtained, this would have reached significance. However, it should be borne in mind that participants in both conditions had very low levels of trauma symptomatology at 12-month follow-up. One member of the control condition met criteria for PTSD at 12-month follow-up.

Similarly to the six-month follow-up results, those in the resilience condition showed less of a relationship between stressor exposure (number of stressors and type of stressors) and trauma symptomatology, suggesting that the stressor-symptom disruption from the resilience training appeared to have persisted to this time point.

At 12-month follow-up 49.4 per cent of participants had total substance involvement scores at risk level (for either use/abuse or abuse/dependence), while 61.8 per cent of participants reported alcohol involvement at risk level (for either use/abuse or abuse/dependence).

Substance involvement was found to correlate moderately at 12-month follow-up with trauma symptomatology: those with higher substance involvement scores were more likely to have high trauma symptomatology scores.

General health levels were stable across time, with the majority of participants (80%) reporting good general health at 12-month follow-up.

Limitations of the study

This study contained several limitations which may have affected the results of the evaluation of the resilience training program. The first limitation was that the full sample follow-up was relatively soon (in six months) and would not be an accurate assessment of sustained change. Although 12-month follow-up data was collected for a subgroup, the number of participants in this group was insufficient to repeat the full host of resilience analyses that were conducted on the six-month follow-up data for the complete sample.

Recently, Layne and colleagues (2007) called for an increase in sophisticated methods for measuring risk and adaptation across multiple domains of functioning and recommended that more longitudinal studies be undertaken (although these authors also noted the formidable logistical challenges of such an approach). They suggested that study designs which comprise at least four waves of data collection over an extended period (often more than two years) may be needed to shed light on the mechanisms and processes that underpin positive adaptation.

Although a short follow-up was necessary in this study because of time constraints, there is an opportunity for future research to include assessment at a longer interval, such as at the five year time-point, to further investigate sustained change. It is expected that only in the longer term, once the police officers have been exposed to numerous high impact stressors, can a reliable test of the intervention be made.

A second limitation was the sample size. Although the sample was relatively large ($n=281$), a larger sample may have detected very small effects, such as those that may be expected to result from a training program. If all squads who had been two to three years at the police academy were included in a resilience training program, it could have the effect of changing the culture of an entire generation of police officers. This presents an interesting opportunity for future research.

Although it was originally planned that reliable change scores would be calculated for all of the major variables, this was not possible because test-retest reliabilities had not been reported for some of the measures, or for some of the measures the means and standard deviations associated with test-retest reliabilities had not been reported. This represented the third limitation of this study. Due to the absence of these statistics, cut-offs had to be used for several analyses instead. This meant that although the numbers of people who had changed categories could be observed and counted, the number of people who **reliably** changed could not be accounted for in several instances.

Although limited in several ways, the results of this study are valuable and provide the first comprehensive development, implementation and evaluation of a resilience training program. The limitations presented by this study are common to training programs and, while researchers and practitioners need to be aware of them, their impact is not significant enough to discredit its findings.

Areas for future research

As previously mentioned, the present study did not comprise the very large sample size needed to detect very small effect sizes for a resilience training program. An area for future research would therefore be to conduct such a training program again, but using a sample of approximately 500.

Also mentioned above was the limited follow-up used for the current study. Effects only started appearing, as expected, at 12-months follow-up, but the data available to us came only from a very small sample ($n=92$). Longitudinal research provides us with valuable information, and the true test of the intervention would best be gauged by a longer term—for example, five or 10-year—follow-up of the complete sample.

An important area of research that is beyond the scope of the current study is the consideration of predictors of who will be best served by resilience training. Participants were assessed for a number of known vulnerabilities to developing trauma symptomatology and substance abuse at the pre-program assessment to ensure that each group was of equal composition at intake. A novel and exciting area for future researchers would be to look at whether certain characteristics make individuals more likely to display enhanced resilience following resilience training. This area of research could have particularly important implications for the emergency services and the armed forces, where it is important to enhance individuals' resilience as much as possible. However, again, such an approach necessitates long-term assessments.

Summary and implications

Most studies of resilience to traumatic events consider it solely in terms of a single dimension of psychological function (eg trauma symptoms, depression or anxiety). Rarely is resilience considered in terms of a number of domains, although this approach was recommended by researchers such as Layne and colleagues (2007). In the current study resilience was considered in terms of three domains, so a much broader range of psychological measures was utilised. This has enabled resilience to be broken down and evaluated in terms of specific elements in a way that has never been undertaken before. This approach highlighted the fact that, as has previously been suggested (eg Masten, 2001), the vast majority of recruits were resilient to exposure to traumatic events. Only two participants, from the control condition, reported trauma symptomatology at six-month follow-up.

A non-significant trend was observed between the conditions in the number people who exhibited resilience for the domain of Workplace Functioning. Those in the resilience condition were more likely to show resilience for Workplace Functioning, suggesting that this domain received the most significant impact of the resilience training. Psychological injuries, which include occupational stress claims, make up 8 per cent of workers' compensation claims in Australian Government agencies but 29.1 per cent of the total claim costs (Australian Government Comcare, 2007). The average lifetime cost of claims for psychological injuries sustained in 2005–06 for Australian Government premium-paying agencies was \$115,000, compared to \$27,000 for a non-psychological claim (Australian Government Comcare, 2006). Therefore, interventions that reduce psychological injuries can have a significant impact on the economy as well as the community.

It has been noted that intervention programs designed to enhance resilience tend to be based primarily on speculation, 'pet' theories, clinical experience and intuition. This carries a number of disadvantages, including the development of an intervention program that lacks adequate scope, effectiveness or efficiency or contains therapeutically inert or potentially harmful components (Layne, et al., 2007).

The current study represents the first time a resilience training program for emergency services personnel has been based upon solid, empirical evidence (Varker, Cook, & Devilly, In press), theories and recommendations (eg Foa & Rothbaum, 1998; Keyes, 1995; Kozak, et al., 1988; National Health and Medical Research Council, 2001; Rapee, 1985). This resilience training program has been shown to contain no noxious or harmful elements, and the modular design means that it can be used for a wide range of professions in a variety of settings. The training program is also a manualised intervention, meaning that it can be disseminated with fidelity, evaluated rigorously and replicated by other independent researchers.

The study found that at six-month follow-up 51.2 per cent of all participants reported total substance involvement scores at risk level (for either substance use/abuse or abuse/dependence) and 56.6 per cent reported alcohol involvement scores at risk level (for either alcohol use/abuse or abuse/dependence). In light of such high percentages, policies and procedures must be put in place to identify and support those with either substance or alcohol use problems. There must be a clear, comprehensive substance use policy

that is widely known about and equitably applied to all (P. Martin, Davey, & Mann, 1998) that clearly outlines employee and employer responsibilities regarding alcohol and drugs. Procedures for dealing with specific circumstances of misuse are essential first steps in providing support (Mann, 2006).

Supervisors would benefit from training in identifying employees who may be at risk of substance use, in recognising emerging problems and in developing strategies for timely referral to support services (Mann, 2006). In 2007 it was announced that Victorian police officers would be subject to routine testing for alcohol and drug use after critical incidents such as police shootings or high-speed chases that result in injuries, and that the Chief Commissioner would be given the power to order tests to protect the 'good order or discipline of the force' (Silvester, 2007). This opens the door for possible targeted or random testing—including of whole squads or stations. Given that the stakes are so high in terms of officers' professional careers and health, it is important that these high levels of drug and alcohol consumption be addressed by Victoria Police. The current resilience study during academy training suggests beneficial effects on workplace burnout, negative affect, relationship satisfaction and trauma symptomatology, which appear to be increasing in strength over time.

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