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The role of disclosure and resilience in response to stress and trauma

Alana Bowen

Thesis submitted in fulfilment of the requirements for a Doctor of Philosophy Degree

with James Cook University

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Alana Bowen

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Date

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## Abstract

Selye (1950, 1984) described the human body's physiological response to stress as a means of coping with adverse conditions. It is plausible that cognitive processes have also been selected to assist humans in coping and achieving resilience in adversity. The core objectives of this dissertation were to extend emotion processing theory (Foa & Kozak, 1986) by examining the relationships among emotional disclosure, resilience, and health-related consequences following stress and traumatic events. Three studies were conducted employing different research designs: correlational, experimental, and observational. A sample of university students and individuals from the wider community ( $N = 109$ ) participated in the first study that examined whether disclosure and a number of resilience factors (hardiness, self-efficacy, social support, and self-deception) were related to one's current feelings about stressful events. Results indicated that participants who received supportive reactions from others when discussing stressful experiences tended to hold positive assumptions about the self, others, and world. In addition, participants with high levels of resilience (hardiness, self-efficacy, social support, and self-deception) tended to report fewer psychological health concerns and had more positive beliefs about themselves, others and the world.

The second study utilized an experimental design to examine whether written emotional disclosure of stressful experiences was related to overall greater health. Results showed that individuals from the general population ( $N = 90$ ) who wrote about personally distressing stressors three times over approximately three weeks tended to report significantly better psychological and physical health, when compared to those who wrote about non-stressful activities. A unique finding was that participants who wrote about their stressful life experiences reported fewer physical and psychological

symptoms if they also reported improved hardiness and self-efficacy following written expression of their most stressful life experiences.

The final study consisted of a sample of Vietnam veterans, peacekeepers, and police members (N = 65) attending a nationally approved PTSD treatment program. To study the results of disclosure within a group format, a disclosure checklist was developed to assess the length of time, the amount of distress, and the type of reactions received from others following trauma-related disclosure. Overall, participants diagnosed with PTSD had better psychological, physical health, world assumptions, and quality of life at both the start and the end of the PTSD program if they had high levels of initial resilience. These findings may have implications for screening procedures for military and paramilitary organisations to assist in identifying individuals who are more likely to recover following exposure to traumatic events. It was also found that participants who developed increased resilience (in particular, higher hardiness) and experienced less distress when discussing their traumatic experiences tended to report fewer psychological symptoms and greater quality of life at the end of the PTSD program. This suggests that efforts should be made by health workers to increase resilience in counselling sessions and to prevent distress levels escalating too far during trauma therapy. Alternatively, these results may reflect that participants were less likely to show distress when discussing their traumatic experiences if they were coping better and had less severe psychological symptoms to begin with. Taken together, the findings of the three studies undertaken suggest that the emotional processing model may be fruitfully extended by including resilience and disclosure as important predictors of response to stress and trauma and in the recovery from PTSD.

## CHAPTER 1

### **Overview of stress, trauma, and posttraumatic stress disorder (PTSD)**

Despite nearly a century of research, stress is a term that has yet to receive a consensual definition. Within the disciplines of psychology and sociology, stress has been defined as a response to an environmental demand (Selye, 1984), or the relationship between physical or psychological demands and the ability to cope with such demands (Neufeld, 1982). Baum (1990) suggested that stress is a negative emotion that results in a range of physiological, behavioural, and biochemical changes, whereas Lazarus and Folkman (1984) have asserted that stress occurs when an individual perceives an environmental demand as exceeding their coping resources. An important aspect of the latter definition is that the severity of stress experienced by the individual depends on a person's perceived coping resources, rather than the objective event or the external evaluation of the individual's ability to cope. The degree of distress experienced during, or in the aftermath of exposure to stress, changes depending on various factors: for example, the individual's perception of the event (Lazarus & Folkman, 1984), personality characteristics (Wofford, Daly, & Juban 1999), coping abilities (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000), support systems (Ozer, Best, Lipsey, & Weiss, 2003), the intensity of the stressor, and the duration of the stressor (Young, 1995).

Stressful life events are ubiquitous. A stressful life event refers to any major event that is anticipated to involve a change in a person's life adjustment (Thoits, 1995). In modern environments, a range of life events may be viewed as stressful: daily annoyances, divorce and marital separation, homelessness, impoverished educational opportunities, being laid off at work, physical illness, caring for a terminally ill child or

parent, death of a loved one, change in residence, financial difficulties, tense and critical family relationships, being incarcerated, motor vehicle accidents, injury and so forth. In addition to negative stressors, positive events can also produce differing levels of stress. Examples of positive stressful events include a job promotion, planning a wedding, buying a house, birth of a newborn, a vacation, opening up a business, and organising presentations (Kaplan & Sadock, 1998).

When an event is viewed as inescapable and overpowering one's existing coping mechanisms, some individuals perceive the stressor as equal to a trauma (Mason, 1990). For example, everyday stressors, such as the pressures of work and family life, have the potential to produce ongoing psychological problems comparable to those that result from war-related experiences (Shephard, 2000). Numerous researchers have also attempted to define traumatic experiences. Traumatic events tend to have certain generic features: threat to life, physical injury or harm, unexpected loss, witnessing or experiencing violence, and exposure to the grotesque (Green, 1990). A range of events can be considered traumatic: rape, physical assault, sexual assault, natural disasters (earthquakes, cyclones, volcanic eruptions, and tsunamis), witnessing bodily harm to others, combat experience, terrorism, mass murders, drive-by killings, torture, mutilation, violent victimisations, and the sudden death of a loved one (Roberts, 2002).

A large number of individuals are exposed to traumatic events that increase risk of death or serious injury. Larkin (1999) suggested that 25% of individuals in the general population will be exposed to a traumatic event (such as war, violent abuse, or a natural disaster) at some point in their lives. An American National Comorbidity Survey found that 56% of participants reported experiencing at least one traumatic event in their lifetime (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), whereas an earlier study

suggested that 89.6% of adults may experience trauma over the course of their life (Breslau, Davis, Andreski, & Peterson, 1991).

### **Previous research on trauma and its sequelae**

Throughout history, people have been subjected to a range of traumatic events ranging from the Messina earthquake in 1907 that killed 70 000 people (Stierlin, 1911) to the bombing of the World Trade Centre in 2001 (Esses, Dovidio, & Hodson, 2002). Such disasters have received attention within psychology, psychiatry, and medicine. Although exposure to traumatic events is widespread, contemporary researchers have recognised that extreme stress differentially affects the cognitive, social, emotional, behavioural, and physical functioning of individuals (Cole & Putnam, 1992; Kroll, Habenicht, & McKenzie, 1989; Magwaza, 1999). A proportion of individuals exposed to traumatic events become stressed beyond endurance and subsequently are fixated on the trauma. It is possible that emotional traumas may lead to long-term disruptions and problems in interpersonal functioning, sexual performance, and work performance (Solomon, 1993). Nevertheless, it is important to note that not all those who experience potentially traumatic events will perceive these events to be traumatic. A large number of people learn to adapt to and overcome adverse events by preventing the traumatic experience from tainting other aspects of their lives (Baruma, 1994). This is clearly portrayed by the considerable number of Holocaust survivors who have not developed and suffered from psychopathology (Levav & Abramson, 1984), as well as the majority of combat veterans.

As early as the mid 19<sup>th</sup> century, people were making claims with regards to the origins of physical problems following exposure to traumatic stress (Erichsen, 1866).

Erichsen (1866) attributed anxiety and hyperarousal symptoms that arose following overwhelming events to biological changes in the body, whereas Page (1885) reported that functional problems following trauma resulted from psychological factors. In a similar vein, the neurologist Charcot (1887) reported that psychological disorders such as hysteria resulted from overwhelming traumatic experiences. The findings of Charcot inspired Janet (1920) to study the nature of traumatic memories and psychopathology. The extensive work conducted by Janet (1920) paved the way for many contemporary researchers (Putnam, 1989; van der Kolk, 1989; van der Kolk & Fisler, 1994). According to Janet (1920), events are viewed as traumatic if they are removed from conscious awareness. Janet (1920) proposed that the recovery rate of traumatised populations largely depends on the ability to categorize and integrate past traumas into current thinking patterns. Those individuals who become “attached” to traumatic events experience continuing personal and occupational problems. Failure to integrate fixed ideas surrounding the traumatic event results in re-experiencing symptoms of the trauma (Janet, 1920). In line with notions set forth by Janet (1920), Breuer and Freud (1955) noted that victims of extreme stress become fixated on traumatic experiences and tried to dissociate such memories from consciousness. In later years, Freud (1958) rejected that dissociation was related to trauma, thereafter claiming that unconscious repressed desires influence the development of psychopathology.

After World War II, several investigations were conducted on the long-term effects of trauma (Archibald & Tuddenham, 1956; Kardiner, 1941; Krystal, 1988). Contemporary knowledge of the long-lasting effects of overwhelming traumas has largely been derived from studies conducted on World War II survivors of combat. In the pioneering work of Kardiner (1941), posttraumatic stress was systematically defined

as *traumatic neurosis* in order to account for trauma victims' enduring vigilance for environmental threat. Kardiner (1941) noted that trauma victims remember the sensory aspects of the overwhelming event in an altered state of consciousness, which generally resulted in chronic irritability and anger reactions. Kardiner (1941) proposed that most traumatised individuals developed an altered sense of the self and the world, and tend to act as if the traumatic event was still occurring. Extreme trauma largely inhibits a person's ability to cope with biological, psychological, and social problems (Archibald & Tuddenham, 1956). Not surprisingly, subsequent health problems are the core negative outcome of extreme stress among traumatised populations (Krystal, 1988).

### **Negative reactions to stress and trauma**

As research in the fields of stress and trauma has proliferated, there has been a concomitant refinement in understanding the process of the stress response. Considerable evidence has accrued to support the thesis that what happens in the aftermath of stress and trauma largely depends on a number of factors (Baruma, 1994; Mason, 1990; Kroll, Habenicht, & McKenzie, 1989). Although there is a growing acknowledgment that the challenges of life can result in emerging health problems, certain experiences may render individuals more susceptible to stress-related conditions. In particular, there is reason to believe that individuals who have witnessed or experienced overwhelming traumatic events during war or peacekeeping missions may be more prone to psychological and physical health problems, when compared to those in the general population (Schlenger et al, 1992). Studies of combatants and concentration camp survivors of World War II revealed that people respond to stressful events in different ways, and there is evidence that overwhelming stressful events

endured by combatants can have negative long-term ramifications for some individuals (Keane, Marshall, & Taft, 2006). Expectations placed upon military populations are unrealistic: not only are they expected to witness horrendous acts and consistently experience traumatic events, such individuals are also expected to re-assimilate into their previous life without difficulty (Raftery, 2003). The pathogenic effects of war may abate for some individuals, however, other veterans may experience prolonged psychological disturbances. The same can be said for people who experience other forms of trauma such as terrorist bombings (Shalev, 1992), family violence (Walker, 1979), prisoners of war (Beal, 1995), and rape (Herman, 1981). In fact, evidence suggests that sexual assault and rape victims are more likely to develop PTSD when compared to those who have been exposed to other traumatic events, such as combat (Foa et al., 1999; Foy, 1992). Sexual assault (rape or attempted rape), childhood sexual abuse (incest, rape or unwanted sexual contact) and childhood physical abuse or severe neglect (beating, burning, restraint or starvation) are cited by Foa and colleagues (1999) as constituting extreme stressors from which PTSD is likely to develop because personal human cruelty has far more devastating effects on the individual than natural disasters or accidents. Foy (1992) claims that sexual assault victims and battered women are at greater risk of developing PTSD than those exposed to accidents, particularly in cases of completed as opposed to attempted rape. It should be noted that prevalence rates show that not all victims of trauma develop PTSD. The victim's recovery environment and individual characteristics are important factors in predicting if and to what extent a person will suffer from a psychological disorder after trauma exposure, which will be explored later (Figley, 1985). The victim may recover from the overwhelming trauma and view the event as a transitory experience, but in others, psychopathology may



develop. From a symptomatologic point of view, almost all individuals exposed to traumatic events will experience intrusive memories or thoughts. However, if an individual lacks the coping skills or resources to deal with the event, they may become overly aroused, anxious, and avoid any reminders of the stressful or traumatic event in order to cope (Litz & Keane, 1989).

When exposed to an overwhelming event, individuals may not be able to consciously accept or understand the totality of the trauma (van der Kolk & Fisler, 1994). Many trauma survivors are unable to give a coherent account of their emotions, thoughts, and perceptions surrounding the trauma. In effect, traumatised individuals may have difficulty fully processing the traumatic experience (Baruma, 1994). However, the ultimate meaning and perception of the traumatic experience is largely influenced by various factors: coping skills, the ability to mobilize support, how much one is challenged by the experience, and previous life experiences (Freedly, Resnick, & Kilpatrick, 1992). Hence, some individuals develop long-lasting negative symptoms following trauma, whereas in others, overwhelming traumatic events may lead to personal growth and new found self-respect. As suggested by Barlow (1988), individuals with biological and psychological vulnerabilities to overwhelming stress may develop beliefs that such stressors are beyond their control or predictability. Traumatised individuals may no longer rely on their feelings to assess situations realistically and make appropriate actions, instead, fight-or-flight reactions commonly prevail (van der Kolk & Ducey, 1989). Individuals have a tendency to respond rapidly to stimuli without adequately assessing the current situation. In this regard, people with histories of trauma are quick to respond to emotional triggers related to the traumatic event, even if such triggers are not threatening (Solomon, 1993).

Overwhelming traumatic events can have lasting negative effects on individuals in terms of interpersonal life, physical health, and psychological well-being. Those exposed to ongoing stressful events, such as prolonged medical disabilities or ongoing familial conflict, are more likely to experience symptoms of depression (Bruce & Kim, 1992; Hooley & Gotlib, 2000; Mazure, 1998). There is growing acknowledgement that negative life events tend to precipitate anxiety-related problems (Eley & Stevenson, 2000; Sandin, Chorot, Santed, & Valiente, 2004; Tiet et al., 2001; Venturello, Barsega, Maina, & Bogetto, 2002). Exposure to a traumatic event and extreme stress is consistently associated with increased risk of somatic illnesses or symptoms, such as respiratory infections (Siegel & Brown, 1988). Evidence suggests that marital and familial satisfaction is also affected by an accumulation of adverse life experiences (Riggs, 2000). In addition, traumatised individuals are at risk of consuming excessive amounts of alcohol or other substances in an attempt to reduce negative emotions arising from the traumatic event (Kilpatrick, Saunders, Veronen, Best, & Von, 1987).

### **Neutral and positive responses to stress and trauma**

Although various studies have suggested that exposure to high levels of negative events is predictive of poorer health (Baum & Posluszny, 1999; Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002), others have suggested that people are quite resilient in the face of adversity. Brickman and Campbell (1971) used the term *hedonic treadmill* to refer to the finding that individuals have the ability to maintain constant levels of well-being, despite being exposed to a range of extreme life events. Such findings suggest that people inevitably adapt to aversive events by returning to baseline levels of well-being. In accordance with this, subsequent studies have demonstrated that people

have a tendency to return to previously established levels of well-being following exposure to negative life events (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). More recent available research has found that there are individual differences in the way that people respond to extreme life events (for a review, see Bonanno & Kaltman, 2001). It has been suggested that discussing personally distressing events may allow individuals to process traumatic events more fully and thus prevent the lack of unintegrated experiences that seem to be associated with persisting stress reactions.

**The value of emotional disclosure following stress exposure.** The open expression of innermost emotions relating to traumatic or negative life experiences was the cornerstone of Freud's (1958) psychoanalytic treatment method. One of the most robust findings of trauma-related research is the finding that disclosing information about emotional traumas is vital for good mental and physical health (Fawzy et al., 1993). Disclosure refers to the verbal or written process of "opening up" and expressing stress-related thoughts and emotions, or describing the cognitive and emotional impact of experiencing one or more distressing events. Discussing one's feelings about a traumatic experience can enhance individual functioning by increasing self-acceptance and providing a new understanding of the event (Clark, 1993). Expressive tasks, such as talking or writing about the emotional impact of a stressful event, are associated with lowered levels of distress, improved physiological functioning, and heightened psychological health (Donnelly & Murray, 1991; Pennebaker, 1995). To date, a recent meta-analytic study conducted with 146 studies indicated a significant salutary effect of written and verbal expression of negative life experiences (Frattaroli, 2006). Methodically writing or talking about stressful life events has been found to encourage

integration, organisation, analytical thinking, understanding, and acceptance of difficult situations (Lyubomirsky, Sousa, & Dickerhoof, 2006). The processing of traumas and negative events helps individuals identify feelings surrounding the experience, which may lead to an enhanced sense of control (Pennebaker & Graybeal, 2001), improved self-perceptions (King, 2001), and an ability to resolve or “let go” of the event (Esterling, L’Abate, Murray, & Pennebaker, 1999).

Furthermore, Greenberg, Wortman, and Stone (1996) demonstrated that writing about an imaginary trauma as though one had experienced it resulted in physical health benefits comparable to another group of traumatised individuals who wrote about their actual trauma. Though not expected, this study found that participants disclosing emotional information about actual traumas reported more avoidance behaviours than those discussing imagined traumas. These researchers proposed that trauma victims benefit from disclosing information about an imaginal trauma because they are able to indirectly confront and work through distressing memories associated with their actual traumas (Greenberg, et al. 1996). Although the study demonstrated physical health benefits following disclosure in the absence of directly experiencing past traumas, it did not explore the relationship between mental health, personal beliefs and worldviews, and disclosing information about an imagined trauma. Though beyond the scope of the current study, future research could examine whether emotional disclosure of ‘imagined traumas’ has an impact on modifying basic beliefs and psychological health.

Although the majority of findings suggest that emotional disclosure is beneficial, some results have been mixed (Donnelly & Murray, 1991). Segal and colleagues (1999) found mixed support for positive health consequences following emotional disclosure when studying elderly widowed individuals (N = 30). Participants in this study were

assigned to a disclosure condition or a delayed disclosure condition (control condition). Those in the disclosure condition were asked to discuss the emotional impact of losing a spouse in four 20 minute sessions across a 2-week period. From pre-test to the 1-month follow-up, participants in both conditions reported significant improvements in obsessive-compulsive symptoms, depression levels, intrusive thoughts, and feelings of hopelessness. Differences between conditions could only be assessed from pre-test to the first post-test session, as participants in the delayed disclosure condition engaged in disclosure exercises in the second session of this study. The only observed difference between conditions by the first post-test was a small increase in hopelessness for the control group (pre-test:  $M = 2.40$ , first post-test:  $M = 3.33$ ) and a small reduction in hopelessness levels for the disclosure group (pre-test:  $M = 4.67$ , first post-test:  $3.27$ ). However, caution should be exercised when considering these results as several methodological weaknesses existed in this study, such as the small sample size. It is also possible that a longer time frame was needed to reliably assess psychological health effects resulting from emotional disclosure.

Other studies have provided evidence that the benefits of disclosure are minimal (Kelly, 1998). According to Kelly (1998), non-disclosure allows clients' to maintain positive self-images, as self-worth may be damaged by disclosing certain information to a therapist. Kelly (1998) criticised research on the benefits of writing about traumatic events, arguing that this form of disclosure is not adequately generalised to therapy. In contrast, Raftery (2003) found that non-disclosure of traumatic events had negative consequences for veterans who engaged in the Kokoda trail campaign. In a longitudinal study, Raftery (2003) found that Australian veterans of the New Guinea campaign were rarely given the opportunity to discuss their war-related traumatic experiences and were

thus not able to confront their emotional distress. As a result, a substantial number of troops developed dysfunctional and destructive behaviours that lead to interpersonal difficulties, anger management problems, and problems associated with substance-related abuse.

**The role of resilience in fostering well-being following stress or trauma.** In addition to disclosure, resilience has also become the focus of considerable attention when attempting to understand how individuals cope with stress and trauma (Waysman, Schwarzwald, & Solomon, 2001). The term resilience historically referred to the successful adaptation to challenging or threatening situations (Stewart, Reid, & Mangham, 1997). According to Bonanno (2004, 2005), people who have high levels of resilience display only mild, transient disruptions in daily functioning following trauma and continue to function in a near normal and healthy fashion. By comparison, individuals who recover from trauma tend to exhibit moderate or threshold psychological symptoms that impede their normal functioning for an extended period of time before returning to their previous level of adjustment (Bonanno, 2005). For the purposes of the current study, resilience includes factors such as self-efficacy, hardiness, self-deception, and social support.

Self-efficacy is a form of resilience that has been well researched within the area of psychology. The term self-efficacy refers to one's perception of their capabilities to initiate and successfully complete specified tasks and persevere in the face of adversity (Bandura, 1986). Self-efficacy affects emotional health through its bearing on coping behaviours. Results of empirical studies have suggested that individuals high in self-efficacy are better able to cope during stress and in the aftermath of negative life events

(Schiaffino & Revenson, 1992). In a review, Benight and Bandura (2004) reported that perceived self-efficacy was an important mediator in the recovery from traumatic exposure across a range of traumas. Other studies have also demonstrated that high self-efficacy is related to more effective coping following a range of traumatic events (Ozer & Bandura, 1990; Murphy, 1987; Solomon, Benbenishty, & Mikulincer, 1991).

Hardiness is another protective factor that contributes to resilience by increasing one's capacity to function in the face of significant adversity or trauma (Kobasa, 1979). According to Kobassa, Maddi, and Kahn (1982), hardiness is a personality dimension that buffers people against the negative effects of extreme stress. Those with this personality trait often display little distress when exposed to highly disruptive and potentially stressful events (Florian, Mikulincer, & Taubman, 1995). In accordance with this, Nowack (1990) suggested that a high level of hardiness is positively related to one's ability to cope with stress and maintain good health status. It has been demonstrated that hardy individuals have better physiological and psychological health when confronted with stress in comparison to less hardy individuals (Banks & Gannon, 1988; Kobasa & Puccetti, 1982). However, levels of hardiness do not always protect individuals from the negative consequences of stress (Benishkek & Lopez, 1997; Funk, 1992). It is possible that hardiness might interact with other factors, or only be protective under some conditions. Research to date has not identified these factors.

The ability to self-deceive may be another factor contributing to resilience. Self-deception is the term used to encompass the ability to view situations in an extremely positive, yet unrealistic manner (Robinson & Ryff, 1999). According to Gur and Sackeim (1979), self-deception occurs when individuals are able to selectively focus on one belief, while another belief is held at a subconscious level. Personal motivations are

thought to influence which belief is available to conscious awareness. Through self-deception, realistic negative perceptions about the self are suppressed and replaced with more desirable cognitions. In other words, people are able to maintain positive impressions of the world by repressing a threatening aspect of reality. It has been suggested that self-deception evolved because it increases feelings of happiness and productivity (Alexander, 1987; Gur & Sackeim, 1979; Lockard, 1980; Surbey, 2004). Further to this, evidence suggests that self-deceptive illusions are adaptive in the sense that they improve one's ability to cope with adversity and negative life events (Allport, 1937; Taylor & Brown, 1988). In support of this notion, depressed individuals generally do not engage in self-deceptive processes but rather view the world more accurately (Abramson & Alloy, 1981). Therefore, it appears as though the ability to deceive oneself about some aspects of self can increase well-being.

Social support seems to be another important factor in determining whether a traumatised individual will develop a disorder (Brewin, Andrews, & Valentine, 2000; Keane, Scott, Chavoya, Lamparski, & Fairbank, 1985). Conceptualisations of social support abound, but most specify that it involves the satisfaction of various basic human needs (such as affection, belongingness, security, safety, and esteem) via interactions with networks of people (Thoits, 1982). An outpouring of research has indicated that greater levels of social support generally buffer the effects of high levels of life stress (Cohen & Hoberman, 1983). However, Kobasa and Puccetti (1982) found that when individuals experience health-related traumas, a sense of control is more important than high levels of social support. Individuals who reported high levels of internal control but low levels of social support displayed better treatment outcomes than those with low levels of control and high levels of support (Kobasa & Puccetti, 1982).



## **Posttraumatic stress disorder (PTSD)**

The effects of traumatic stress are numerous and complicated. The majority of adults and children are resilient when confronted with a traumatic experience and do not develop chronic emotional disturbances and pathology. Nevertheless, it has been demonstrated that exposure to traumatic events increases one's risk of acquiring various mental health problems (Keane & Wolfe, 1990). Abuse, torture, violence, and war experiences may lead to the development of symptoms that derive from the unresolved aspects of the traumatic experience. In reviewing the literature, posttraumatic stress disorder (PTSD) is one of the most common long-lasting consequences of extreme stressors and traumatic events (Breslau, Davis, Andreski, & Peterson, 1991; Elliott, 1997). PTSD is one of the few psychological disorders for which the apparent cause is considered to be identifiable, as PTSD is a psychological response to intense traumatic events involving a threat to life (Mason, 1990). It is a complex psychobiological disorder set in motion by the complex interaction between an exogenous event, and psychological, biological, and social processes that disrupt the daily functioning of those diagnosed with it (Rothschild, 1995). According to Andreasen and Wasek (1980), the affective, cognitive, and behavioural symptoms of PTSD represent a generalised reaction to trauma.

In addition to being labelled *post-rape syndrome*, PTSD has been called a variety of names including *soldier's heart* in the American Civil War; *shell shock*, *traumatophobia*, and *nervous exhaustion* during World War I; *battle fatigue*, *physioneurosis*, and *accident neurosis* during World War II; *war neurosis*, *delayed reaction syndrome*, and *post war neurosis* during the Korean War; *combat stress reactions*, *survivor's syndrome*, and *transient situational disturbances* during the

Vietnam War (Burgess & Holstrom, 1974; Commonwealth Department of Veterans' Affairs, 1999; Da Costa, 1871; Myers, 1915). Posttraumatic stress disorder was formally recognised as an anxiety disorder in the Diagnostic and Statistical Manual of Mental Disorders-Third Edition (DSM-III) psychiatric nomenclature that appeared in 1980. The Diagnostic Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV) states that the symptoms of PTSD develop when a person reports feeling "fear, helplessness or horror" after experiencing or witnessing a life threatening event. In order to obtain a diagnosis of PTSD, clients must present with the following six criteria:

1. Criterion A: The person has been exposed to a traumatic event in which both of the following were present:
  - a. The person either experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others
  - b. The person's response involved intense fear, helplessness or horror
2. Criterion B: The traumatic event is persistently re-experienced in one (or more) of the following ways:
  - a. Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions
  - b. Recurrent distressing dreams of the event
  - c. Acting or feeling as if the traumatic event were recurring, this may include a sense of reliving the experience, illusions, hallucinations, and

dissociative flashback episodes, including those that occur on awakening or when intoxicated

- d. Intense psychological distress on exposure to internal or external cues that symbolise or resemble an aspect of the traumatic event

3. Criterion C: This criterion entails the persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

- a. Efforts to avoid thoughts, feelings, or conversations associated with the trauma
- b. Efforts to avoid activities, places, or people that arouse recollections of the trauma
- c. Inability to recall an important aspect of the trauma
- d. Markedly diminished interest or participation in significant activities
- e. Feelings of detachment or estrangement from others
- f. Restricted range of affect (eg. Unable to experience love and happiness)
- g. Sense of a foreshortened future

4. Criterion D: These are persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:

- a. Difficulty falling or staying asleep
- b. Irritability or outbursts of anger
- c. Difficulty concentrating
- d. Hypervigilance

e. Exaggerated startle reactions

5. Criterion E: Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month
6. Criterion F: The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

In order to receive a diagnosis of PTSD, a person must have experienced or witnessed a traumatic incident. In addition, they must present with at least one of the five re-experiencing symptoms from Criterion B, three of the seven avoidance and emotional numbing symptoms, and have two of the five hyperarousal symptoms. It is important to note that if an individual does not report the specified number of symptoms for any criterion, they are not considered to have PTSD. At first glance, these symptoms may appear to be part of a normal response to an overwhelming experience or event. For example, most victims of traumatic events report experiencing intrusive thoughts and images within 48 hours of the experience (Creamer, Burgess, & Pattison, 1992; Joseph, Yule, & Williams, 1995; Shalev, 1992). However after a period of time, such intrusions fail to evoke intense emotional reactions for those without a diagnosis of PTSD (Shalev, 1992). For people with PTSD, thoughts and physiological states experienced at the time of the event seem unaltered by the passage of time; the victim views the trauma as a contemporary experience and feels as though the event is happening again (van der Kolk & Fisler, 1994). Thus, PTSD can be viewed as a normal

reaction to extreme stress that keeps persisting beyond its normal length of experience (Horowitz, 1986).

Since its development, the DSM has received criticism for lacking a solid empirical base (Shephard, 2000). However, the DSM-III-R (1987) and the DSM-IV (1994) resulted from substantial empirical research which involved comprehensive reviews of previous literature and extensive field trials. Although the DSM-IV phenomenological diagnosis of PTSD captures several symptoms experienced by highly traumatised individuals, the formal classification of this disorder does not encapsulate the complexity of people's reactions to extreme stress (Cole & Putnam, 1992). Other symptoms associated with extreme trauma include depression, anxiety, disturbing dreams, interpersonal problems, detachment, guilt, intense distress, and alcohol and substance abuse (Muir & Neistadt, 1988). McCann and Pearlman (1990) reported that these symptoms are not included in the DSM-IV classification because this diagnostic instrument was developed to aid diagnosis rather than describe every psychological facet that PTSD patients will experience.

### **Prevalence rates of PTSD**

In the late 1980s, a study on the U.S. population revealed that the lifetime prevalence rate of PTSD was less than 1.0% as measured by the National Institute of Mental Health Diagnostic Interview Schedule (DIS; Helzer, Robins, & McEvoy, 1987). However, this study has been criticised on methodological grounds such as using a limited sample of the general population (Keane & Penk, 1988). Using a nationally representative sample of 5877 participants, the American National Comorbidity Survey found that 56% of people will be exposed to a traumatic event at some point in their

lives and of these approximately 7.8% (10.4% of men and 5.0% of women) will develop PTSD (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Other evidence suggests that approximately 5% to 10% of individuals exposed to traumatic events later develop PTSD (Buckley, Blanchard, & Hickling, 1996). In the Australian National Morbidity Study, the estimated prevalence rate of PTSD in the general population was 1.3%, with 64.6% of men and 49.5% of women having ever experienced a traumatic event. Of those who had experienced a trauma, 1.9% of men and 2.9% of women met the criteria for PTSD over the previous 12 months (Creamer, Burgess, & McFarlane, 2001).

As one would expect, the prevalence of PTSD among military populations is somewhat higher. According to recent data, 10% of military populations deployed for combat and peacekeeping operations will develop PTSD when they return from their tour of duty (Schlenger, Fairbank, Jordan, & Caddell, 1999). Such rates of PTSD may not seem surprising when considering the intensity and frequency of threatening situations that deployed military personnel experience. A review of research on PTSD by Oei and colleagues (1990) suggested that the incidence rate of PTSD for veterans exposed to high levels of combat ranged from 35% to 70%. The prevalence rates of PTSD among Australian veterans are quite disparate. O'Toole and colleagues (1994) conducted a study on Australian Vietnam veterans and found that 20% of veterans had experienced PTSD symptomology since their tour of duty. More recently, O'Toole and colleagues (1996) found that prevalence rates of PTSD for Vietnam veterans was 20.9% when symptoms were measured using the Standardised Clinical Interview (SCID-PTSD). However, the incidence of PTSD was 17.1% when those Vietnam veterans were assessed using the Diagnostic Interview Schedule (DIS-PTSD-combat). Thus, it appears as though prevalence rates of PTSD fluctuate depending upon the type of

measure utilised to measure the symptoms of this condition. Based on the aforementioned figures, it seems reasonable to assume that PTSD affects approximately 2% to 8% of the general population and 18% of Australian Vietnam veterans. As PTSD is a common psychological reaction to traumatic stress, several theories have been developed to explain the development and maintenance of this condition.

### **Theories of PTSD and stress-related conditions**

**Behavioural theories.** *Conditioning and instrumental learning* are some of the most accepted explanations for the maintenance of PTSD symptoms following exposure to trauma-related cues. The basic tenet of conditioning is that individuals exposed to traumatic events are conditioned to previously neutral stimuli that co-occur with the event (Keane, Fairbank, Caddell, Zimering, Bender, 1985). Exposure to such conditioned stimuli will subsequently elicit a conditioned emotional response (CER) that is similar to the emotional response elicited during the trauma (Keane et al., 1985). Instrumental learning refers to a process of behaviour modification where a specific behaviour is changed via positive or negative reinforcement (Keane et al, 1985). Keane and colleagues (1985) found that combat-related PTSD patients were able to reduce anxiety when they limited their contact with negative emotional stimuli. When in combat, continual reinforcement of such avoidance behaviours becomes an overlearned process. When the war terminated, it was functional for individuals to disregard these avoidance responses as they were no longer beneficial to survival. Individuals who maintained such behaviours were likely to develop the PTSD symptom called emotional numbing in order to avoid negative emotional images, memories, and feelings associated with traumatic events at war (Keane et al., 1985). According to behaviourist theorists,

anxiety disorders such as PTSD are maintained because individuals repeatedly avoid confronting fear-producing stimuli and thereby prevent the extinction of the fear (Mowrer, 1960).

**Biological theories.** One way of understanding the processes involved in the evolution of PTSD and other stress-related conditions is to explore Hans Selye's (1950, 1984) General Adaptation Syndrome (GAS). According to Selye's (1950, 1984) GAS model, individuals respond to overwhelming stress in three stages. Firstly, the body's natural defence mechanisms are activated when confronted with a physical or psychological stressor. The immune system is depressed initially, which makes individuals more susceptible to disease and illness. The second stage is when the immune system goes into action and attempts to overcome the stress response. As the stressor continues, the system enters the third, exhaustion phase, when the body's defences and immune system are unable to cope with the ongoing stressor, and illness prevails (Selye, 1984).

Selye focused on the hypothalamic-pituitary-adrenocortical (HPA) system as a key factor in the stress response. When exposed to traumatic stress, the limbic system releases a range of hormones that prepare the body to respond to threat. The amygdala sends out signals to almost all parts of the brain (including the lateral hypothalamus, reticular pontis, and the rostral ventral medulla) to activate the sympathetic nervous system. This process activates the adrenal glands, which accelerate heart rate, increase respiration, and send blood away from the skin to the muscles, thereby preparing the body for the *fight or flight response* (Christopher, 2003; Rothschild, 2000). At the same time, the parasympathetic nervous system initiates the HPA axis by stimulating the



hypothalamus to release corticotropin-releasing hormone, which activates the adrenal gland to release catecholamines and cortisol. Once the amygdala no longer detects the traumatic incident, cortisol returns the HPA axis to homeostasis by producing epinephrine and norepinephrine. It has been suggested that some individuals are more vulnerable to developing pathological disorders because of a biological deficiency in the HPA system (Christopher, 2003; LeDoux, Iwata, Cicchetti, & Reis, 1988; Rothschild, 2000). The biological mistuning of the HPA axis has been found to predispose individuals to pathology in the aftermath of trauma (Christopher, 2003; Rothschild, 2000). Specifically, individuals who develop PTSD following trauma are hypothesised to be unable to adequately modulate the normal adaptive response via the HPA axis.

It has also been argued that PTSD is a fear-related incapacitating disorder that involves a range of neurophysiological changes. Evidence suggests that traumatic events may result in alterations and structural changes in the brain (van Ellen & van Kammen, 1990). More specifically, excessive stimulation of the central nervous system appears to result in neuronal changes that negatively influence learning and habituation (Kolb, 1987). Research has demonstrated that traumatic experiences produce increased autonomic arousal, and this arousal is mediated by changes in neurotransmitter systems (van der Kolk, Greenberg, Boyd, & Krystal, 1985). According to van der Kolk and colleagues (1985), catecholamines such as epinephrine (adrenaline), norepinephrine (noradrenaline), and dopamine are activated and increased during extreme stress. It has been found that chronic stimulation by norepinephrine results in neurons that are oversensitive to norepinephrine stimulation arising in response to threat. Therefore, individuals with PTSD experience tolerance for arousal and autonomic hypersensitivity to situations involving minor stress or no threat (van der Kolk, Greenberg, Boyd, &

Krystal, 1985). Cortisol levels are also affected by exposure to overwhelming stress and trauma.

Studies have demonstrated that high levels of norepinephrine occur in response to extreme stress, whereas cortisol levels can either increase or are depleted (Mason, Kosten, Southwick, & Giller, 1990). Although it seems paradoxical for cortisol levels to decrease in response to trauma, studies have revealed that female assault victims that display lower acute cortisol levels following rape are more likely to develop PTSD (Resnick, Yehuda, Pitman, & Foy, 1995). Under extreme levels of stress, cortisol levels decrease in association with the overuse of psychological coping and defence mechanisms, such as emotional numbing (Mason, Kosten, Southwick, & Giller, 1990).

According to Bremner and colleagues (1992), hippocampal size is smaller in PTSD patients compared to the general population. Individuals who have experienced complex physical and sexual child abuse have been found to show marked reductions in left hippocampal volume (Bremner, Southwick, & Charney, 1999). Atrophy of parts of the hippocampus has been found in combat veterans, demonstrating that increased exposure to trauma is related to a decrease in hippocampal volume (Yehuda, 1999). However, it is not known whether the hippocampi of individuals with PTSD were smaller prior to the trauma, or whether stress hormones reduced hippocampal activity, which made the hippocampi smaller. According to Graham and colleagues (Graham, Heim, Goodman, Miller, & Nemeroff, 1999), earlier stresses may reduce hippocampal volume, which thereby predisposes individuals to develop PTSD. Evidence also suggests that the locus coeruleus, which acts as an alarm centre, may be poorly regulated among individuals with PTSD (Davidson, 1992).

**Cognitive theories.** Cognitive theorists maintain that the fundamental views that individuals hold for themselves and the world largely guide their thoughts and behaviours (Fiske & Linville, 1980). Consequently, cognitive models of psychopathology largely revolve around mental representations such as schemas, propositions, and networks, in order to organize information (Chemtob, Roitblatt, Himada, Carlson, & Twentyman, 1989; Fiske & Linville, 1980; Fiske & Taylor, 1991). According to cognitive theorists, memory, attention, thinking, and other cognitive processes influence such cognitive representations. Several cognitive theories based on different concepts (for example, schematic representations, referential representations, and associative networks) have emerged to explain the impact of overwhelming stress and trauma.

**Schema theories.** The term *schema* refers to a way of internally organizing or representing concepts and experiences (Fiske & Linville, 1980). Schemas are also described as mental representations that reflect generic aspects of the world and the self (Swann & Read, 1981). According to Janoff-Bulman (1992, p. 28), schema refers to a “mental structure that represents organized knowledge about a given concept or type of stimulus”. Although numerous definitions exist, each description maintains that the primary role of schemas is to organise a diverse range of information into a common, abstract structure (Dalglish, 2004). Thus, schema theories advocate that a single aspect of mental representations can adequately explain a range of data or processes. A schema does not store information about specific instances, rather it contains generic information about a stimulus, event, or concept (Janoff-Bulman, 1992). Cognitive schemata allow individuals to interpret and understand emotionally arousing

experiences (Janoff-Bulman, 1992). Cognitive scientists suggest that schemas are automatically and unconsciously activated in response to an individual's perception of environmental cues (Bargh & Chartrand, 1999). Furthermore, research has indicated that individuals have a biased tendency to discard schema-incongruent material and behave in ways that confirm extant beliefs so that pre-existing schemas remain intact (Swann & Read, 1981). This finding is in accord with research conducted in social psychology that has demonstrated that individuals are motivated to maintain cognitive consistency (Festinger, 1957). It is important to acknowledge that there are advantages for maintaining schemas. For example, it is effective to rely on schemas to guide behaviour if such cognitive representations are well founded. Nevertheless, developing new schemas is important when trying to eliminate extant maladaptive core beliefs (Dalglish, 2004). Such schematic change may occur in incremental steps from the processes of assimilation or accommodation. During assimilation, new experiences are incorporated into extant mental representations, whereas accommodation involves modifying pre-existing mental representations so as to include new information (Bargh & Chartrand, 1999; Piaget, 1952).

Within clinical psychology, schema theory has been most notably applied to depression through the work of Aaron Beck (1967). According to his cognitive model, depressive psychopathology develops and is maintained by a person's tendency to selectively attend to negative information that is consistent with their extant negative schemas (Timbremont & Braet, 2004). Schema theory has also been applied to the domain of PTSD with the work of many researchers (Chemtob, Roitblatt, Himada, Carlson, & Twentyman, 1989; Foa & Cahill, 2001; Horowitz, 1982; Litz & Keane, 1989; McNally et al., 1987). Several cognitive theorists maintain that PTSD patients

exhibit an attentional bias for trauma-related material because they develop cognitive representations (schemas) of their trauma that are readily stimulated by potentially threatening information (Chemtob, Roitblatt, Himada, Carlson, & Twentyman, 1989; Litz & Keane, 1989; McNally et al., 1987). Schema theory has been applied to PTSD beginning with the work of Horowitz (1986), followed by that of Janoff-Bulman (1989a, 1989b, 1992; Janoff-Bulman & Frieze, 1983).

*Horowitz's (1986) schema model of adjustment.* Mardi Horowitz's (1982, 1986) comprehensive schema theory, which is based on information-processing and psychodynamic traditions, has received the most attention in detailing the emotional deficits present in PTSD patients. Although Horowitz (1982) used the term *models of reality* and *inner models*, the term schema will be employed synonymously for ease of reference. According to Horowitz's (1997) *completion tendency*, individuals have a penchant to incorporate new information into existing schematic representations if such information is consistent with the content of older schemas. Horowitz (1997) proposed that traumatic events render individuals with two opposing internal processes called *intrusion* and *defence*. When confronted with traumatic events, individuals are unable to integrate such incoming thoughts or images into pre-existing cognitive structures (the intrusion stage). Consequently, people use defence mechanisms in order to prevent conscious processing of the traumatic information (the defensive stage), which results in emotional numbing and denial. For Horowitz (1997), traumatic experiences are maintained active in short-term memory during the defensive stage. Active memory continually examines the contents of the traumatic event, thereby resulting in intruding flashbacks, nightmares, and unwanted thoughts. According to Horowitz's (1997)

schema model, individuals repeatedly shift from the intrusion phase to the defensive stage until the traumatic information is slowly and gradually assimilated into long-term schematic representations.

Horowitz's (1982, 1997) schema model provides an impressive account of many of the symptoms of PTSD. As previously mentioned, traumatic events render individuals with the two opposing internal processes called intrusion and denial. During the intrusion phase, individuals are beset with the challenge of integrating or accommodating the re-experiencing and hyperemotional symptomology of PTSD into cognitive schemas. For Horowitz (1982, 1997), these cognitive and emotional symptoms remain stored in active memory and cannot be organized by existing schemas. Traumatic information is assimilated into pretrauma configurations of schemas as active memory continually processes the traumatic event, leading to the development of hyperarousal. During the defensive stage of adjustment, the use of denial is intended to protect oneself against trauma-related feelings, memories, and thoughts. Emotional numbing may be viewed as an aspect of denial, because numbing involves emotional avoidance in an attempt to cope with and resolve posttraumatic stress (Litz, 1992). According to Horowitz's (1982, 1997) schema model, PTSD patients repeatedly shift from the intrusion phase to the defensive stage until they can cope with the aftermath of the trauma. Individuals will develop PTSD if, and only if, an inability to incorporate the trauma (due to extreme denial or emotional numbing) prevents the emotional processing needed for resolution of the trauma (Litz, 1992).

To summarise this model, Horowitz (1982, 1997) claimed that a single fundamental dimension manages traumatic material by first processing avoidance and numbing symptoms and then the mechanism works through re-experiencing symptoms,

such as intrusive thoughts. However, one should bear in mind that alternative theorists have speculated that an automatic mechanism regulates hyperarousal and numbing symptomology, whereas a strategic mechanism processes intrusive and avoidance (re-experiencing) symptoms (Foa, Zinbarg, & Rothbaum, 1992). Thus, according to this theory, two separate mechanisms regulate PTSD symptoms rather than one mechanism. When considering the usefulness of Horowitz's (1982, 1997) model, Litz (1992) correctly acknowledged that this model fails to explore the situational factors that may elicit denial, avoidance, and emotional numbing.

*Janoff-Bulman's (1989) schema model of adjustment.* Originating from social cognitive psychology, Ronnie Janoff-Bulman (1989a, 1989b, 1992; Janoff-Bulman & Frieze, 1983) devised another theory that applied schema theory to PTSD. Although different terms were used, this theory was closely linked to the general approach outlined by Horowitz and colleagues. In contrast to the theory set out by Horowitz, however, this theory focuses more on the content of schemas prior to traumatic events. Janoff-Bulman (1989a, 1989b) asserted that most people share three assumptions about the world that are affected by traumatic events. These fundamental assumptions are: 1) a belief in one's invulnerability and that the world is benevolent; 2) having a positive view of the self; and 3) perceiving the world as meaningful and comprehensible (Janoff-Bulman, 1989a; Janoff-Bulman, 1992; Janoff-Bulman & Frieze, 1983). These positively biased assumptions about the self and the world enable individuals to approach the world with optimism and trust, and to feel safe and secure (Janoff-Bulman, 1989a). According to Janoff-Bulman (1989b, p. 52), traumatic experiences are so intense that they "shatter core assumptions" and pre-existing schemas. The developmental corollary

of this theory is that prior beliefs ultimately influence how individuals react to traumatic events. Traumatic experiences induce a psychological crisis: individuals can no longer view themselves and the world through rose-coloured lenses. Rather, traumatic events force a sudden realisation that humans are vulnerable, that mortality is inevitable, and that the world is not a safe haven (Janoff-Bulman & Frieze, 1983). As the schemas individuals hold for their personal life do not concede the possibility that traumatic events may happen to them, trauma-related experiences result in inner turmoil. In the aftermath of a trauma, individuals cannot return to the prior equilibrium because such extant assumptions are no longer apt representations of the world and self (Janoff-Bulman, 1989, 1992). It is suggested that the old schemas are disregarded in a sudden and dramatic fashion, which contrasts with Horowitz's belief that slow schematic change occurs in the context of traumatic experiences (Dalglish, 2004).

In an attempt to integrate traumatic experiences into prior assumptions or schemas, individuals alternate between two processes. First, individuals respond to traumatic events through the avoidant processes of emotional numbing and denial. Conscious avoidance behaviours may include avoiding any entity or place associated with the traumatic event. Automatic or unconscious avoidance behaviours may include denying the reality of the event as well as trauma-related feelings and thoughts. Secondly, individuals involuntarily re-experience the trauma and have intrusive recollections, thereby confronting negative thoughts and feelings surrounding the traumatic event (Janoff-Bulman, 1989; Janoff-Bulman & Frieze, 1983). As in Piaget (1952) and Horowitz (1982, 1997), re-experiencing symptoms occur so that individuals examine pre-existing assumptions and new information more closely, such that the pre-existing assumptions are accommodated and traumatic experience are assimilated into



extant schemas (Janoff-Bulman, 1989, 1992). Survivors of atrocities of war and other human-induced traumatic experiences tend to hold negative schemas about themselves and the munificence of the world: the world is seen as more malevolent and the self is viewed as less worthy (Janoff-Bulman, 1992). According to Janoff-Bulman's (1989) theory, if traumatic events result in catastrophic damage to schemas of the self and world, individuals may find it too difficult to recover their original schemas and therefore develop PTSD.

*Associative network theories.* To further understand the mechanisms involved in posttrauma reactions, Lang's (1979) bio-informational theory of emotion has been applied to PTSD populations. Extending Pylyshyn's (1973) analysis of a propositional network as related concepts forming an organized system, Lang (1979) utilised propositions to understand fear reactions. Within the context of PTSD, propositional representations allow one to understand the content of this disorder by using abstractions that do not confound the meaning of PTSD (Dalglish, 2004). Lang's (1979) theory of anxiety stipulated that fear-related stimuli are organized in memory in a way that makes cognitive, motor, and physiological responses to threat readily available. Cues that trigger emotional responses and information about the meaning of these cues are also taken into account when organizing emotional information in semantic networks (Lang, 1977; Lang, 1979, Lang, Bradley, & Cuthbert, 1990). Thus, this organised network contains information that helps individuals determine if they should avoid or escape certain situations (Foa & Kozak, 1986). For Lang (1979), two steps must take place to alleviate a person's fear: first, fearful memories must be activated by presenting the individual with feared information, and secondly, the individual needs to be presented

with information that is incompatible with aspects of their feared memories. Exposure to information that is inconsistent with the feared memory is expected to result in reduced fear responses (Lang, 1979). Lang (1979) contended that individuals with anxiety disorders have partially activated or primed fear-relevant cues in an associative network in memory. Therefore, only a limited amount of fearful information needs to be presented to activate the trauma network of PTSD patients (Foa & Kozak, 1986). However, it is more difficult for such individuals to modify or eliminate feared responses (Hemenover, 2003). According to Hemenover (2003), the fear-relevant network in memory is composed of thoughts and emotions surrounding both the trauma and one's self-understanding of the trauma. As this interconnected system of traumatic memories largely focuses on the individuals' self-concept, it is therefore difficult to modify a person's understanding of the traumatic experience

It has been suggested that individuals with PTSD use dysfunctional cognitive strategies to maintain symptoms of the disorder (Ehlers & Steil, 1995). Ehlers and Steil (1995) speculated that a *distress* and an *avoidance* pathway maintain posttraumatic symptomatology in PTSD patients. According to this theory, individuals develop negative meanings of arousal and of re-experiencing symptoms during the *distress* phase, which in effect, may lead to short-term physical problems such as sleep disturbances. These physical symptoms may then elicit subsequent re-experiencing symptoms. The individual may then experience heightened levels of distress and arousal, thereby confirming their prior interpretation of arousal symptoms. During the *avoidance* stage, individuals are motivated to impede re-experiencing symptoms by adopting avoidance strategies. Individuals may utilize cognitive avoidance strategies such as thought suppression, which has been shown to increase symptoms of PTSD

(Chemtob et al., 1989). Thus, avoiding the traumatic experience leads to further hyperarousal and intrusive symptomatology.

***Emotion processing theory.*** Foa and colleagues developed an integrated cognitive model for understanding PTSD that combines the advantages of the aforementioned schematic and associative network theories (Foa & Cahill, 2001; Foa & Kozak, 1986; Foa & Rothbaum, 1998). The term *emotion processing theory* was coined by Brewin and Holmes (2003) to refer to an integrative model that explains the complex interaction of three factors in the onset and maintenance of PTSD. These factors include: 1) memory records of the trauma, pre-trauma events, and post-trauma events; 2) schemas; and 3) the range of post-trauma reactions of the self and others (Brewin & Holmes, 2003). Basically, this model attempts to explain why some individuals recover from overwhelming traumatic events while others develop chronic conditions. A schematic representation of this model is presented in Figure 1.

Like Horowitz (1982, 1997) and Janoff-Bulman (1989a, 1989b, 1992), proponents of emotion processing theory suggest that intrusive memories and avoidance symptoms of PTSD occur because traumatic experiences challenge pre-victimized schematic representations (Foa & Rothbaum, 1998). Based on the three assumptions set out by Janoff-Bulman (1989a), it has been argued that traumatic events challenge the two schematic representations of the world and self. The two dysfunctional cognitions that contribute to PTSD symptomatology include a view that the world is completely dangerous and a view that the self is completely inept. The term *world* in this context is an abstract concept that refers to people and events (Foa & Rothbaum, 1998). Foa and colleagues (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999; Foa & Rothbaum, 1998) suggest

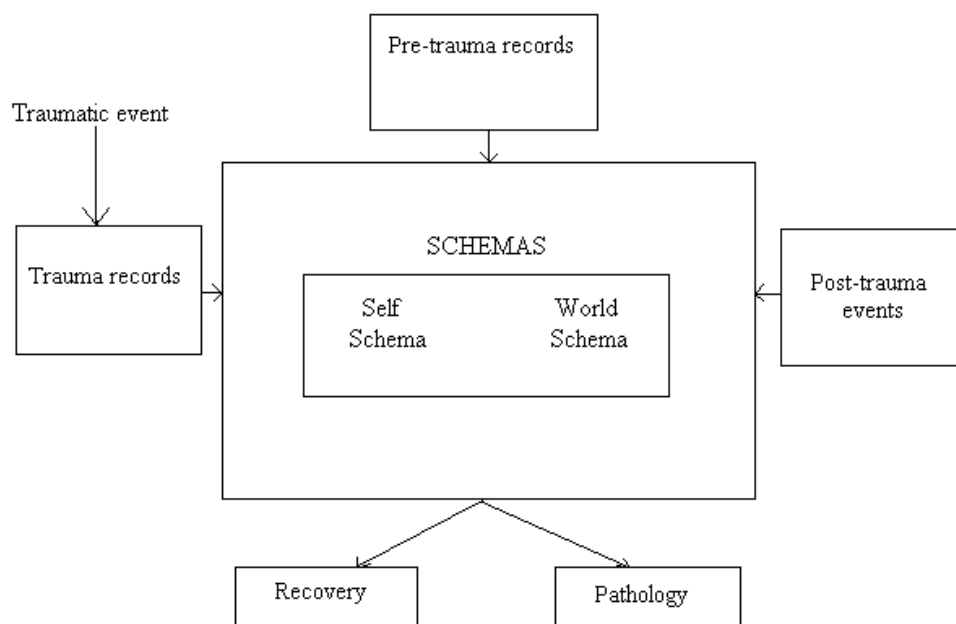


Figure 1.

*A schematic diagram of emotion processing theory*

that there are two separate ways that individuals may develop such negative schemas. They suggest that negative pre-trauma histories of the self and world increase susceptibility to PTSD, because such core assumptions are confirmed by the negative aftermath of victimizing events (Foa & Rothbaum, 1998). Foa and colleagues (1998, 1999) also argued that individuals may have trouble assimilating traumatic experiences into extant schemas if they held extremely positive views of the self and world prior to the traumatic event. Thus, viewing the world as completely dangerous (or safe) and the self as completely inept (or competent) prior to traumatic events renders individuals vulnerable to PTSD. Previously held rigid views about self-competence and the

dangerousness of the world seem to render less adept processing of a traumatic event and increases a person's likelihood of developing chronic emotional disturbances.

Presumably, individuals with more realistic and moderate views about the self or the world will be better able to process traumatic experiences as an unusual event, and therefore should be able to maintain their previously held beliefs.

Within this model, the term *memory record* is broadly similar to the components of the associative network theory reviewed earlier, however some important differences exist. According to Foa and Rothbaum (1998), individuals develop a plethora of stimulus-danger associations in memory when they are confronted with highly traumatic events. Thus, a wide range of people, events, and places are viewed as dangerous following traumatic victimizations, even if such stimuli are only tangentially related to the trauma. This model also posits that individuals exposed to traumatic events are at risk of developing PTSD symptomatology because strong emotions experienced during the trauma may disrupt memory, attention, and perception. Such a claim suggests that treatment aiming to increase the organisation of memory records will decrease one's likelihood of developing further PTSD symptoms. Although this suggestion was supported by several studies (Foa, Molnar, & Cashman, 1995; Foa & Riggs, 1993), Halligan and colleagues (2003) reported that organized memories of events were not associated with a reduction in PTSD symptoms following treatment. Emotion processing theorists have argued that trauma memories are associated with a wider range of behavioural responses (for example, dissociation, emotional numbing) and physiological responses (for example, accelerated heart rate, cold sweating, heart palpitations) when compared to more benign fear memories (Foa & Rothbaum, 1998; Halligan, Michael, Clark, & Ehlers, 2003). Behaviours aimed at reducing the negative

impact of the trauma such as screaming, pleading, or emotional numbing are also encoded in the memory record. It seems as though trauma victims who develop chronic emotional disturbances interpret these responses and behaviours as reflecting personal incompetence, which impedes recovery (Foa & Rothbaum, 1998).

The final component of emotion processing theory refers to *posttrauma reactions* that become recorded in memory after the traumatic experience. The personal meaning of the trauma and its outcomes influence whether one will develop severe posttraumatic symptoms. Individuals seem to have difficulty processing their traumatic experiences if they view their interactions with others as negative or believe that other people reacted negatively to them following their trauma (Foa & Rothbaum, 1998). This tendency to view the responses of others negatively increases the trauma victims belief that the world is unsafe and that they are incompetent. For example, repeated appraisal of the dangerous nature of the traumatic event will likely result in a global view that the world is dangerous, which will be complemented by intrusive memories, hyperarousal, and negative affective responses (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999). Recovering from a traumatic experience increases substantially when the trauma is viewed as time-limited, rather than as an all-encompassing boundless event (Foa & Rothbaum, 1998). Individuals may believe that they are incompetent because they feel as though they have no control over their posttraumatic symptoms. Such beliefs are more likely to occur if the individual previously held schemas that focused on personal ineptness (Foa, Steketee, & Rothbaum, 1989).

Emotion processing theory offers an explanation of how PTSD treatment can help individuals assimilate trauma-related memories into schematic representations. With respect to treatment, maladaptive beliefs (such as the world is dangerous and the

self is inept) can be challenged with the use of exposure techniques (Foa & Rothbaum, 1998). The basic suggestion is that discussing traumatic memories within a safe therapeutic environment promotes the development of new schemas of the self, others, and the world that centre on safety and controllability (Foa & Rothbaum, 1998). Furthermore, by focussing on the trauma memory as a time-limited experience, the individual is able to differentiate and isolate the victimization from other life events and experiences. Such isolation helps individuals realise that the world is not a completely dangerous place (Foa & Rothbaum, 1998). Exposure to traumatic memories also provides individuals with the opportunity to realise that PTSD symptomology is not a sign of one's incompetence (Foa, Steketee, & Young, 1984). Foa and Kozak (1986) noted that two conditions are required to help individuals emotionally process traumatic events. Basically, the feared memory network must be activated by discussing fear-related information and new information that is inconsistent with the pathological trauma memory network must be incorporated.

### **Aim of current research program**

Converging evidence has demonstrated a relationship between exposure to traumatic events and the subsequent experience of impaired somatic and psychological health. Historically, human beings have always been exposed to a range of extreme stressors and traumatic events and presumably natural selection has endowed them with mechanisms to cope with such events (Christopher, 2003; Teicher et al., 2002). In the same way that Selye (1950, 1984) found that the body physiologically responds to stressors in an adaptive way, it seems plausible that cognitive processes have evolved to help humans cope with stressful life experiences. The conceptual model that guided the

present research is that resilience and self-disclosure are adaptive as they improve psychosocial functioning, somatic health, and psychological well-being. The goal was to potentially extend emotion processing theory by examining whether resilience and self-disclosure of stressful and traumatic experiences contributed to well-being. The inclusion of these variables into emotion processing theory is expected to further explain recovery from stress and trauma. A schematic diagram of the proposed extensions to the emotion processing model can be seen in Figure 2.

Proponents of emotion processing theory suggest that traumatic events challenge basic beliefs that individuals hold about the world and self. More specifically, individuals who rigidly view the world as highly dangerous and the self as highly inept prior to traumatic events tend to exhibit more intense emotional reactions. This suggests that pre-trauma basic beliefs about the world and self may play an important role in how individuals respond to traumatic events. Due to pragmatic and ethical issues, and time constraints, it was not possible to assess the beliefs of individuals before they experienced a highly stressful or traumatic event. Instead, three studies were conducted to examine the value of the proposed new components of emotion processing theory in reaction to stress and trauma that had previously occurred.

According to proponents of emotion processing theory, individuals benefit from discussing feared events within a safe environment and by focusing on information that is inconsistent with the feared memory. Foa and Kozak (1986) proposed that the process of deliberately focussing on the feared memory and challenging it with incompatible information is the essence of recovery from trauma. Thus, one may assume that emotional disclosure serves this purpose as feared traumatic memories are activated and there is a possibility for new insights to be gained by discussing traumatic experiences.



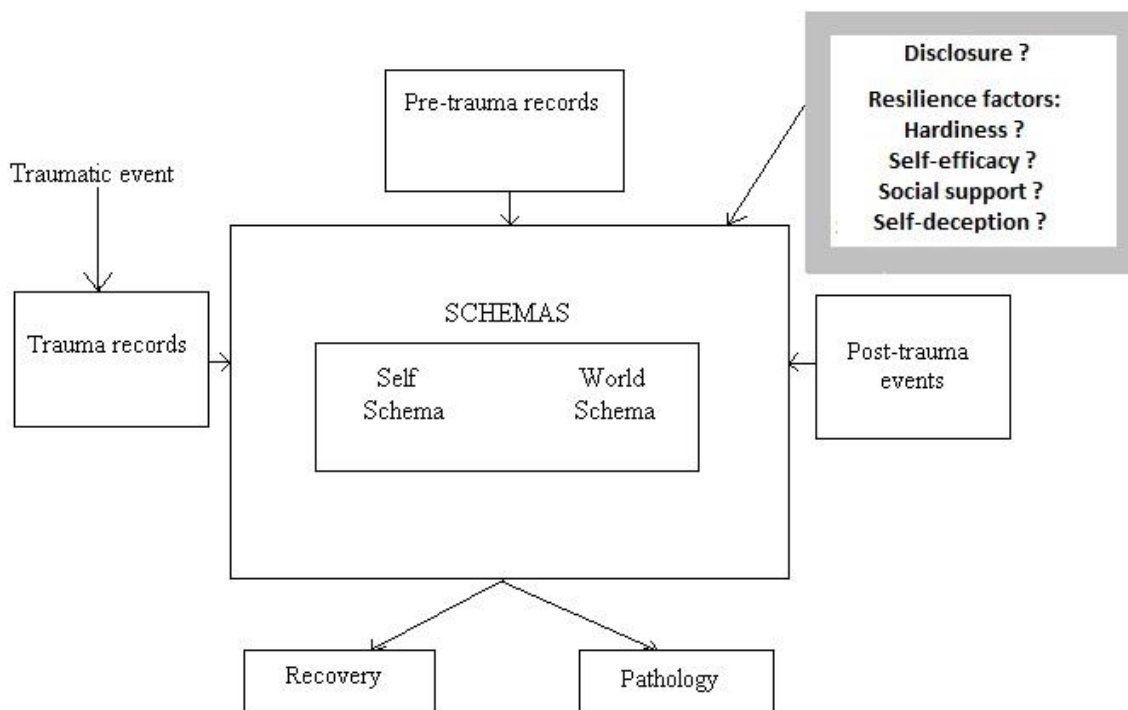


Figure 2.

*A schematic diagram of proposed extensions to emotion processing theory*

Self-disclosure with supportive others provides an avenue for individuals to confront overwhelming stressful events and traumas. As emotion processing theory further states that posttrauma responses and reactions influence the type of posttraumatic symptoms that individuals develop, this implicitly implies that post-trauma health is partly dictated by social support and reactions of confidants following self-disclosure of adverse events. Thus, the role of social support following exposure to overwhelming stress or trauma was also explored. If psychologists, counsellors, and social workers alike can understand what helps some people regulate personal functioning in the context of

adversity, “victims” could potentially benefit from this knowledge being incorporated into existing therapeutic programs.

The aim of the current studies were to clarify these notions, and extend emotion processing theory by exploring whether emotional disclosure (verbal and written), and resilience (hardiness, social support, self-efficacy, and self-deception) were associated with PTSD and other physical or psychological health problems. The first study was conducted to determine if past reactions to stress-related disclosure were related to psychological health and world assumptions. This correlational study also aimed to determine whether high levels of resilience were related to more positive world assumptions and psychological health. The second study asked participants to disclose stressful experiences via writing in order to examine whether this was related with improved overall health, in terms of world assumptions, appraisals of stressors, personal growth, resilience, psychological health, and physical health. It was also anticipated that participants would report fewer physical and psychological health complaints if their resilience improved following written emotional disclosure of stressful experiences. The goal of the final study was to examine if participants diagnosed with PTSD improved in terms of resilience, psychological health, quality of life, and world assumptions following participation in an 8-week group therapy PTSD program. It was also necessary to examine why such improvements occurred, and to determine what factors were related to improvement. For example, was it the case that those who were more resilient at the start of the PTSD program had better psychological health and quality of life at the end of the program? Or did improvement in resilience contribute to such positive changes? Alternatively, did disclosure contribute to positive changes in health in addition to improvements in resilience?

In summary, the core objectives of this dissertation were as follows:

1. To investigate the relationships among social support, self-efficacy, hardiness, self-deception, and psychological and physical health in those exposed to stress or trauma.
2. To determine the relationships among emotional disclosure, psychological symptoms, and physical health outcomes.
3. To identify who benefits from written or verbal disclosure, and to determine under what conditions disclosure and resilience result in beneficial outcomes.

## CHAPTER 2

### **Study 1: Relationships among disclosure, resilience, life stressors, and psychological health**

#### **Measuring stressful life events**

The term *stressful life events* can refer to a range of desirable and undesirable experiences that involve change or adjustment (Thoits, 1995). This may include changes in life circumstances such as being laid off from work, marital separation, relocating to a new city, beginning university, buying a house, planning a wedding, and so forth. It is widely acknowledged and accepted that exposure to stressful life events can have deleterious effects in terms of somatic and psychological health (Cohen et al., 1998; Sandin, Chorot, Santed, & Valiente, 2004; Tennant, 2002). Although the consequences of overwhelming stress have been well recognised for many centuries, objective measures of stressful life events were first devised in the 1960s and 1970s. Following Seyle's (1950) work on stress, researchers began to develop objective inventories that identified the type of stressful life events experienced by individuals. The pioneering work of Thomas Holmes and Richard Rahe (1967) resulted in the development of a scale for measuring life events. The original checklist, the Holmes-Rahe Social Readjustment Rating Questionnaire (SRRQ) published in the *Journal of Psychosomatic Research*, provided a list of forty-three empirically defined stressful life circumstances. The most difficult events to adapt to were considered to be losses, such as the death of a spouse, death of a close family member, or divorce.

In order to measure the impact of stressful life experiences systematically, exposure-based theorists recorded the number of life events (or the sum of weighted events) experienced by individuals (Rudolph & Hammen, 1999). Life events can be

quantitatively weighted by examining the emotional impact evoked by certain events or by exploring the amount of adjustment displayed by individuals when confronted with specific events (de Faire & Theorell, 1976). After administering their paper-and-pencil checklist to a panel of 394 individuals, Holmes and Rahe's (1967) weighted scores were derived (ranging from 10 to 100) by estimating the amount of change that specific life events required, irrespective of whether the events had desirable or undesirable components (Masuda & Holmes, 1967). Although these weighted scores were based on subjective evaluations, such scores have been described as universally accepted (Holmes & Rahe, 1967; Masuda & Holmes, 1967).

Since the formulation of this inventory, consistent results have demonstrated a positive relationship between stressful life events and impaired health (Chiriboga, 1989; Dohrenwend & Dohrenwend, 1973, 1974; Tausig, 1982). However, this inventory has been criticised for not adequately measuring all possible stressful life events. Reliance upon this measure alone would not effectively measure the entire spectrum of stressful life events that individuals may experience. In addition to measuring only a finite number of stressors, the items on this self-rating scale do not provide precise descriptions of the stressful events, which may affect responses of participants. Researchers have also claimed that the SRRQ is not appropriate for etiological research as items were based on the experiences of people recently diagnosed with illnesses (Dohrenwend, Krasnoff, & Dohrenwend, 1978). According to the *contamination hypothesis*, statistically significant relationships between the SRRQ and stress-related outcomes occur because several items on the scale are in fact stress-related outcomes (such as changes in eating and sleeping patterns). However, this scale continues to demonstrate a clear relationship between life stress and psychological symptoms, even

when the inventory was modified to exclude “contaminated” events (Turner & Wheaton, 1995). Critics posit that the only purpose of this scale is to demonstrate “the extent to which life events previously associated with the onset of illness continues to be associated with the onset of illness” (Dohrenwend, Krasnoff, & Dohrenwend, 1978, p. 208). Another content-related criticism of this scale relates to its inclusion of desirable and undesirable events as precipitators of stress. Some researchers have called into question the reliability of scoring desirable life events such as pregnancy or marriage in the same direction as undesirable events listed on the SRRQ (Beasley, Thompson, & Davidson, 2003). Although it has been claimed that undesirable events would impede psychological health more than desirable stressful events, recent research suggests that examining only the undesirable events listed on the SRRQ would result in an underestimation of the impact that life events have on stress-related outcome scores (Scully, Tosi, & Banning, 2000).

Despite the aforementioned shortcomings of the SRRQ, this life event checklist continues to be the measurement of choice for clinicians and researchers interested in health outcomes following stressful events (Hock, 1995; Taylor, 1991; Turner & Wheaton, 1995). Therefore, this scale was utilised in this dissertation for two studies, as it allows researchers to easily and quickly examine the level of stress experienced by participants during a specific time frame.

### **Relationship between depression and stressful events**

A number of investigations using different methodologies and studying diverse cultures have found that an accumulation of life events is related with psychological difficulties (Eley & Stevenson, 2000; Hooley & Gotlib, 2000; Mazure, 1998; Tennant,

2002). Specifically, ongoing stressful life events are associated with depression or depressive symptomatology (Hooley & Gotlib, 2000; Mazure, 1998). According to DSM-IV, people with major depressive disorder have a depressed mood or loss of interest in daily activities that consistently occurs for at least two weeks. However, individuals may experience depressive symptoms such as sadness and despair without meeting the criteria for a formal diagnosis (Hankin & Abramson, 2001). As early as the 1960s, case-controlled investigations demonstrated that individuals with depression were more likely to experience stressful life events prior to the onset of their condition, compared to control participants from the general population who were matched on age, gender, and socioeconomic status (Paykel et al., 1969). Supporting earlier work, more recent studies have demonstrated that depressive symptomatology tends to be associated with negative life circumstances (Kendler & Prescott, 1998; Kraaij, Arensman, & Spinhoven, 2002; Moos, Schutte, Brennan, & Moos, 2005). According to Finlay-Jones and Brown (1981), depressed individuals are more likely to experience events characterised by loss (such as, little to no intimate relationships with others) when compared to control participants. In a similar vein, a behaviour genetic study indicated that depressed individuals tend to report experiencing significantly more loss events (loss of an attachment with someone, or a loss of a valued idea or aspiration) relative to non-depressed individuals (Eley & Stevenson, 2000). As further proof of the importance of life events to psychological health, findings indicate that chronic exposure to stressful life events increases a person's risk of developing depressive symptoms as individuals may become overburdened. Ongoing stressors that tend to confer risk for depression include prolonged medical disabilities or illnesses, ongoing interpersonal stressors (such as conflict), and living in poverty (Bruce & Kim, 1992; Dohrenwend et

al, 1990). Although prior stress has been linked to increased depressive symptoms, other researchers have suggested that adverse life events can protect individuals from the development or recurrence of depression. For example, Farmer and McGuffin (2003) found that exposure to non-severe levels of stress over time confers resilience to more severe or threatening stressors and can reduce a person's vulnerability to depression.

Various models and theories have been developed in an attempt to explain the relationship between stressful life events and depression, such as Beck's (1967) cognitive model of depression. Beck (1967) argued that individuals with depression have developed negative views or schemas of the self, the world, and the future during childhood as a result of exposure to adverse events during their development. These schemas increase a person's risk of developing depression as such views tend to focus on past failures and feelings of incompetence (Alloy et al., 2006). Although these negative views tend to stay dormant for many years, depressed individuals tend to revert back to these earlier views when confronted with an overwhelming stressful event or trauma. Beck suggested that stressful events are not the trigger of depression, but rather earlier formed negative views produce depressive symptoms (Beck, 1967; Beck & Steer, 1987). Beck's theory is in line with other *vulnerability* or *stress-diathesis models*, which assert that pre-existing characteristics of individuals and social situations moderate the relationship between stressors and depression (Brown & Harris, 1978). This interactive model claims that the relationship between individual characteristics and depression depend on the severity of the stressor: Individuals are more at risk of depression when exposed to high levels of stress, irrespective of predispositions or social experiences, whereas individuals exposed to low levels of stress are more vulnerable to depression if they have predisposing factors. Overall, proponents of vulnerability models posit that



the way in which individuals interpret and recall negative events increases susceptibility to depression when confronted with adverse life stressors (Dohrenwend & Dohrenwend, 1981).

The *additive burden* or *strain model* provides an alternative theory to the perspective set forth by the vulnerability theory of depression. According to the additive burden model, pre-existing individual dispositions, social circumstances, and life stressors make independent contributions to the occurrence of depression, rather than pre-existing factors and social situations moderating the effects of stressful life events (Dohrenwend & Dohrenwend, 1981). Thus, the combination of predispositions, social situations, and life stress influence depression levels (Rodgers, 1991). In contrast to the previously mentioned models, proponents of the *proneness model* suggest that a history of depression is predictive of increased exposure to adverse life circumstances, which in effect leads to an exacerbation of the condition (Schumm, Stines, Hobfoll, & Jackson, 2005). Although not exhaustive or mutually exclusive, these theories have brought attention to the importance of examining the relationship between depression and negative life events.

Research suggests that women are more likely than men to experience depressive symptoms (Kessler, 1997; Sandanger, Nygard, Sorensen, & Moum, 2004). The phenomenon of higher rates of depression in women illustrates the possibility that stressful life circumstances influence depressive symptoms differently for women and men. Gender differences in depression have been explained by increased exposure to adverse life experiences among women because of gender roles and socialisation processes (Turner, Wheaton, & Lloyd, 1995). However, traditional gender differences in the occurrence of depression following stressors may be changing as women are more

inclined to challenge gender stereotypes. According to Bebbington and colleagues (1988), women are exposed to negative life events more often than men, and are more vulnerable to respond with depression when exposed to such events (Kessler, 1997; Sandanger, Nygard, Sorensen, & Moum, 2004). Although others have agreed that negative life events are strongly related to depressive symptoms, some studies show that there is no apparent gender difference of depression in the aftermath of negative events (Salokangas & Pouanen, 1998; Turner & Avison, 1989). Given the importance of determining whether the occurrence of stressors increases or decreases depression in males and females, the discrepancies in the published literature are unequivocal.

### **Relationship between anxiety and stressful events**

Several decades of clinical research have demonstrated that specific types of adverse life events are associated with anxiety symptoms and anxiety-related disorders (Eley & Stevenson, 2000; Finlay-Jones & Brown, 1981; Sandin, Chorto, Santed, & Valiente, 2004; Tiet et al., 2001; Venturello, Barsega, Maina, & Bogetto, 2002). When asked to recall life events that precipitated their diagnosis of anxiety, 15% of anxious individuals reported suffering loss events in comparison to 77% of anxious participants experiencing threatening life events (Finlay-Jones & Brown, 1981). In accordance with such findings, more recent studies have demonstrated that anxiety disorders and anxiety-related symptoms tend to be preceded by threatening events. A study of child and adolescent twins demonstrated that individuals with anxiety reported significantly higher levels of threat events (such as fearing the loss of an attachment figure, possible exposure to dangerous events, potentially witnessing traumatic events, and exposure to psychological challenges) when compared to non-anxious individuals. It was also found

that twins with anxiety experienced significantly more threatening events than non-anxious twins (Eley & Stevenson, 2000).

Although the majority of studies indicate that threatening life events tend to precipitate anxiety-related problems, Sandin and colleagues (2004) found that there was a non-significant difference in the percentage of threatening events experienced by depressed and anxious participants. However these researchers found that control participants reported experiencing significantly fewer threatening events in comparison to those diagnosed with psychological conditions. Relative to depressed participants, anxious participants believed that threatening events would result in greater exposure to stressors. Barlow (1988) found that young women respond differently to stressful life events when compared to young men, which may account for the predominance of females being diagnosed with anxiety disorders or related symptoms. It has been suggested that females experience a greater number of adverse life events during childhood and adolescence when compared to males, and thus learn early in life that they have little control over the consequences of such events (Chorpita & Barlow, 1998). According to Barlow (2002), women have a heightened risk of developing anxiety-related conditions later in life because early experiences have taught them to view life adversities as unpredictable and uncontrollable.

### **Stress exposure and the effects of cognitive appraisals**

It is important to clarify whether exposure to stressful events *per se* is consequential for impaired psychological health. Proponents of exposure-based approaches use tallies to keep count of the number of life events experienced by individuals (Rudolph & Hammen, 1999). Although this approach objectively measures

the number of stressors that individuals report experiencing, it fails to consider the context of the stressful event. That is, studies using objective ratings of negative events are unable to explore whether some individuals view similar (or identical) events to be more stressful than others, which in effect, may confound stress exposure and one's perception of the stressor. To compensate for this, it seems wise to explore both the number of negative events that individuals experience and the degree to which the exposed individual perceives the event to be stressful (Rudolph & Hammen, 1999).

According to Lazarus and Folkman (1984), exposure alone is not sufficient to elicit stress-related emotional symptoms. They claim that it is important to examine subjective assessments and take into account individual differences in the experience of specific stressful events. Lazarus and Folkman (1984) assert that the impact of life events depends on a person's interpretation of the significance of the event. However, other researchers have proposed that individual assessments of stressful events do not adequately reflect the independent contribution of the event because subjective ratings are biased by various factors, such as personality and other individual characteristics (Dohrenwend, Link, Kern, Shrout, & Markowitz, 1990). In an effort to study the contribution of life stress to psychological health in the current study, both exposure and personal appraisals of life experiences were measured.

The importance of assessing both exposure and perception of stress is made clear by the finding that exposure to negative events leads to emotional impairments only if the individual cognitively appraises the specific event as stressful. The term *cognitive appraisal* refers to "the process of categorising an encounter, and its facets, with respect to its significance for wellbeing" (Lazarus & Folkman, 1984, p. 31). The way in which events are appraised helps to explain why certain events are perceived as stressful to

some people and not so for another person (Park & Folkman, 1997; Pearlin, 1991). There is considerable agreement that cognitive appraisals mediate the relationship between exposure to stress and the subsequent inner experience of the event. According to Lazarus and Folkman (1984), people can appraise stressful events as benign, threatening, challenging, harmful, or as a loss. Individuals tend to make threat-related appraisals if they perceive an event as overpowering their own coping resources. In contrast, people make challenge appraisals in response to stress if they feel equipped with the necessary skills and abilities to overcome or endure the event. Evidence supports the proposal that viewing stressful situations as a challenge, rather than a threat, reduces its negative emotional impact (Aspinwell & Taylor, 1997). According to Aldwin (1994), older individuals have a tendency to appraise stressful life events as less threatening.

Certain beliefs have been found to predispose people to view stress in a particular way. For example, Tomaka and Blascovich (1994) noted that justice beliefs are related to challenge-related appraisals. When exposed to potentially stressful situations, such as mental arithmetic tasks, individuals who endorsed strong beliefs in a just world tended to appraise the stressful event as a challenge rather than a threat. In contrast, individuals who had low beliefs in a just world tended to perceive the stressful task as threatening and exceeding their coping abilities. In a similar vein, Tomaka and colleagues (1992) concluded that self-deceptive beliefs moderated the relationship between threat appraisals and psychophysiological reactivity to stress. According to these researchers, individuals low in self-deception cognitively appraised a potential stressful task as more threatening than did individuals with high levels of self-deception.

### **Beneficial effects of resilience following stress**

Considerable research has demonstrated that various resilience factors influence how a person reacts to overwhelming stress or trauma (Bonanno, 2005; Waysman, Schwarzwald, & Solomon, 2001; Wolff, 1995). Resilience has been variously defined, however, in the current context it refers to the capacity for successful adaptation, despite challenging circumstances, and the development of competence under conditions of pervasive or severe adversity (Wolff, 1995). Certain psychological and social resources appear to increase emotional stability and counter the negative consequences of stressful life circumstances. Understanding the role of resilience may offer theoretical and practical explanations as to why some people cope well in response to stress and trauma, when others do not. A better understanding of such domains may provide useful information that could be incorporated into existing therapeutic interventions for people who have experienced posttraumatic reactions and stressful events. By determining which factors allow some individuals to recover from stress and trauma, we may be able to learn, distil, and distribute this information to people diagnosed with stress-disorders (such as PTSD), their families, and others who share the responsibility for stressed and traumatised individuals. For the purpose of this doctorate, resilience referred to a heightened ability to cope with stressful circumstances as indicated by high scores on measures of social support, self-efficacy, hardiness, and self-deception. Examination of these combined predictors could be considered innovative as past research has tended to examine such factors as separate entities.

**The benefits of social support and disclosure following stress exposure.** The majority of research studies conducted on life-stress adjustment attempt to identify

which variables buffer the deleterious effects of negative life circumstances. Numerous studies have explored the stress-moderating role of social support, with differing results. The term social support has been defined as any form of assistance that is given to individuals who have experienced a stressful event (Thoits, 1982). Social support can also be viewed as the receipt of information or actions that makes an individual feel valued and able to obtain help when needed (Heller, 1979). When confronted with a stressful life circumstance, there is a tendency for people to enlist social support in an attempt to withstand the stress. Individuals with low levels of social support tend to be more prone to psychological difficulties following exposure stress (DeLongis, Folkman, & Lazarus, 1988), whereas those with adequate social support tend to be better able to demonstrate resilience in times of stress (Cohen & Syme, 1985). Although Kobasa and Puccetti (1982) found that internal control was more important than social support in buffering the effects of health-related traumas, the majority of research has consistently found beneficial effects of social support following overwhelming stress or traumatic exposure.

Social support has the potential to offset the negative impact of stressful life events. As mentioned earlier, a common consequence of stressful life circumstances is the development of psychological conditions, such as depression. It has been argued that a deficit in social support heightens the risk of developing depression following exposure to extreme stress (Pierce, Frone, Russell, Cooper, & Mudar, 2000). Thus, when confronted with adverse life events, there is a tendency for people to cope better if they receive high levels of social support from family and friends. According to the *stress buffering model*, people with relatively supportive social networks tend to report greater psychological and physical health in response to stressors when compared to

people that receive low levels of social support (Takizawa et al., 2006). In effect, those who receive greater social support are more inclined to feel equipped to effectively deal with stressful life circumstances. Early proponents of this buffering model speculated that although social support was effective in reducing psychological conditions following extreme stress, the degree of social support one receives has little effect among those exposed to low amounts of stress (Cohen & Hoberman, 1983).

In addition to social support, self-disclosing traumatic experiences tends to have a beneficial effect on physical health and psychological well-being (Smyth, 1998). The process of translating stressful experiences and traumas into verbal expression has the potential to promote human welfare and is consequential for psychological health in the aftermath of adversity. Research suggests the repeated expression of stress-related feelings is necessary for habituation of distress to occur. Stanton and colleagues (2000) found that college students showed no difference in physiological arousal or negative affect during or immediately after a five minute discussion with an interviewer about either their feelings or facts surrounding their parents' chronic physical or psychological condition. However, when individuals further engaged in such discussions two days later, a difference emerged with students who discussed their feelings reporting less negative affect and displaying reduced levels of physiological arousal.

According to Foa and colleagues' emotional processing theory, interventions help individuals recover from traumatic experiences by correcting and challenging pathological elements of feared memories. Deliberately focussing on feared memories and challenging them with incompatible information appears to be the essence of successful therapeutic emotional processing (Foa & Kozak, 1986). Thus, one may assume that self-disclosure of stressful life experiences with supportive people allows



this to happen as the stress-related or traumatic memories (fear network) are activated and there is a possibility for new insights (incompatible information) to be gained by discussing stressful experiences. As emotion processing theory further states that posttrauma responses and reactions influence the way in which an individual responds to traumatic events, this implicitly implies that psychological health following overwhelming stressors is partly dictated by social support and the reactions of confidants following self-disclosure of emotional events. Thus, in order to gain a clear understanding of the recovery process following overwhelming events, it seems imperative to explore the type of responses that individuals receive from others.

Although some people process negative life events by expressing their concerns with others, other people prefer not to discuss such information (Lyubomirsky, Sousa, & Dickerhoof, 2006). According to Harber and Pennebaker (1992), traumatised individuals suffer a “cruel paradox” because failing to disclose may result in somatic and psychological symptoms, whereas choosing to reveal personally distressing experiences has its own additional risks. For example, individuals may conceal information from others for fear of being ridiculed or alienated from their listening confidant (Kelly & McKillop, 1996). As stressful life events and traumatic experiences are often difficult to understand, sufferers may be unwilling to discuss their experiences and actively inhibit their desire to self-disclose. On initial inspection, one may assume that health and well-being would be affected among individuals who avoid disclosing stress-related experiences. However, verbally disclosing stressful or traumatic, emotional experiences is not always helpful and can confer some risks. Among the major risk factors identified is the possibility of being criticised, rejected, punished, alienated, or ignored by the listener when describing the traumatic event(s) (Kelly, 1998). A number of researchers

have identified that negative social interactions in the aftermath of stress confers reduced health (Davis, Brickman, & Baker, 1991; Lepore 1992; Schuster, Kessler, & Aseltine, 1990). Therefore, an examination of negative and positive aspects of social exchanges seems necessary to understand the role of social support and verbal transactions in psychological health.

Though some researchers suggest that support networks often assist people who are experiencing emotional stressors (Albrecht & Adelman, 1984; Stroebea, Schutb, & Stroebeb, 2005), other investigators have argued that significant others and confidants may become critical, avoid such discussions, or downplay the sufferers' situation (Kelly, 1998; Lehman, Ellard, & Wortman, 1986; Rook, 1984). Thus, it seems important to examine perceived social support following stress discussions or trauma-related disclosure. The relative impact of positive and negative social exchanges was demonstrated in a study that found that perceiving others as supportive was significantly and positively associated with measures of well-being (such as quality of life scores) but was not related to measures of negative psychological health (such as distress) (Zautra & Reich, 1983). It has been suggested that social support from a spouse particularly influences adjustment to stress, as such relationships generally involve heightened emotional exchanges (Coyne & DeLongis, 1986; Cutrona, 1996; Newcomb, 1990). For the purpose of the current study, participants were asked to indicate the degree of perceived support they have received from family, friends, partners, and health professionals with regard to disclosing information about their most stressful life event. Based on findings by Newcomb (1990), it seemed important to examine the independent influence of social support dimensions as the impact of positive and negative supportive exchanges may differ depending on the source.

**The benefits of self-efficacy following stress.** Empirical evidence suggests that a heightened level of personal efficacy improves one's ability to cope following exposure to overwhelming stress (Schiaffino & Revenson, 1992). Self-efficacy is a term that refers to a person's perceived ability to successfully execute specific tasks and cope with undesirable situations (Bandura, 1997). Thus, one of the defining characteristics of self-efficacy is the belief that individuals can personally influence their own outcomes (Aspinwall & Richter, 1999). Individuals with a strong sense of efficacy perceive themselves as being able to competently produce designated levels of performance and complete specified tasks, whereas the reverse is true for those with low levels of self-efficacy (Bandura, 1986, 1977). According to Benight and Bandura (2004), self-efficacy is critical for human action as it allows individuals to persevere when faced with taxing adversities.

There is a growing body of evidence that suggests that maintaining an efficacious outlook enhances personal well-being in a number of ways. For example, people high in self-efficacy view adversity and setbacks as challenges to master rather than as personal threats to avoid. According to Sullivan and Bybee (1999), a high level of self-efficacy improves adaptive coping behaviours such as increased access to social support networks. It is also important to note that self-efficacy is not static, but rather is modifiable in response to experience (Bandura, 1977, 1997). Abused female participants (N = 278) who were exposed to a 10-week program tailored to increase self-efficacy in obtaining support reported greater access to social support (emotional and material resources) than women randomly assigned to the control condition (Sullivan & Bybee, 1999).

Efficacious thinking has a protective function as it allows individuals to remain unperturbed with distressing or debilitating events. In support of this notion, Murphy (1987) examined distress symptoms of individuals exposed to the traumatic volcanic eruption at Mount St. Helens. Stepwise regression indicated that distress levels shortly after the volcanic eruption were predicted by the magnitude of one's loss following the eruption and by one's perceived self-efficacy to overcome this traumatic event. A follow-up study three years later indicated that self-efficacy was the only variable that predicted distress levels. Thus, disaster survivors who endorsed high efficacious beliefs were free of enduring distress several years after the volcanic eruption (Murphy, 1987). Maintaining high levels of self-efficacy has also been identified as a critical factor in lowering distress and traumatic stress symptoms (Gibbs, 1989; Regehr, Hill, & Glancy, 2000). For example, using a sample of recruits and experienced fire-fighters ( $N = 65$ ), a relatively recent study showed that self-efficacy was negatively associated with depression ( $r = -0.25$ ) and traumatic stress symptoms ( $r = -0.35$ ) as measured by the Beck Depression Inventory (BDI) and Impact of Event Scale (IES; Regehr, Hill, Knott, & Sault, 2003). The restorative role of self-efficacy is clear with respect to dealing with stressful events and life circumstances. Self-efficacy is an important quality to possess as it potentially helps people to overcome negative life events rather than letting their lives be dictated by events they see as cataclysmic.

**The benefits of hardiness when exposed to stress.** The term hardiness has been defined in various ways, including 'proprie striving' by Allport (1955), competence by White (1959), and strenuousness of authentic living by Kobasa and Maddi (1971). It has been suggested that hardiness is a general health promoting factor (Bigbee, 1985), which

enables individuals to remain both psychologically and physically healthy despite confrontations with stressful situations or experiences (Kobasa, Maddi, & Kahn, 1982). Individuals with heightened levels of hardiness tend to perceive stressful life events as less threatening and less distressing (Weiebe, 1991). According to Wallace, Bisconti, and Bergeman (2001), hardiness is associated with a tendency to perceive changes in life as opportunities for personal growth (challenge). Hardy individuals also have a tendency to believe that they have a level of control over their life (control) and find meaning in what they are doing in their lives (commitment).

Among the factors known to correlate with hardiness is a high degree of psychological and physical health. High levels of cognitive hardiness moderate the adverse effects of overwhelming stress in terms of depression (Nowack, 1989) and illness levels (Kobasa, 1979). More recent research has supported the finding that cognitive hardiness can directly (and indirectly) influence psychological and somatic health (Beasley, Thompson, & Davidson, 2003). Using a sample of university students over the age of twenty-five ( $N = 187$ ; women = 106, men = 81), it was found that high scores in cognitive hardiness significantly predicted lower scores of depression and anxiety as measured by the SCL 90-R. Furthermore, hardiness scores moderated the relationship between negative life events and psychological health among women ( $N = 106$ ) by significantly reducing the impact that stressors have on scores for measures of somatic symptoms, anxiety levels, depressive symptoms, and social dysfunction (Beasley, Thompson, & Davidson, 2003). Blaney and colleagues (1991) also found that social support and cognitive hardiness significantly predicted psychological health, as measured by stress-related distress, although neither resilience variable moderated the relationship between stress and distress. It is important to note that levels of hardiness

do not always protect individuals from the negative consequences of stress (Benishek & Lopez, 1997; Funk, 1992). Thus, it is possible that hardiness might interact with other factors, or only be protective under some conditions.

Since the development of the hardiness construct, numerous measures have been designed and applied. Initially, different items from scales such as the Alienation Test (Maddi et al., 1979), the Internal–External Locus of Control Scale (Rotter et al., 1962), the Personality Research Form (Jackson, 1974), and the California Life Goals Evaluation Schedules (Hahn, 1966) were combined to form the Unabridged Hardiness Scale (Ouelette, 1993) to measure the three dimensions of hardiness. The items in this scale were negatively formulated and as such the instrument measured the absence of hardiness rather than the presence of it, which led to some problems, such as confounding with neuroticism (Funk & Houston, 1987). In later instruments, such as the Dispositional Resilience Scale (Bartone et al., 1989), the numbers of positively and negatively formulated items were more equal. According to Nowack (1989), there was a need to develop a valid instrument to determine whether particular variables (such as, hardiness) moderated the relationship between stress and health status. Nowack devised the Stress Assessment Inventory, which includes nine subscales (including a Cognitive Hardiness subscale). This scale has been found to assess the concept of hardiness as conceptualised in the original work of Kobassa (1979), and has been found to have good reliability (Nowack, 1990).

Despite the utility of hardiness measures, some limitations exist. A criticism of hardiness-related research is deciding whether to examine the hardiness construct as a unitary concept, rather than a multi-dimensional phenomenon. Major controversy exists among researchers as to whether hardiness is a unitary concept, or an amalgamation of

the three components of commitment, control, and challenge (Carver, 1989; Funk, 1992; Funk & Houston, 1987; Schmied & Lawler, 1986). Some researchers continue to use an overall hardiness score because factor analytic studies have failed to reproduce separate commitment, control, and challenge components (Funk, 1992; Funk & Houston, 1987), whereas other researchers use separate subscales (Schmied & Lawler, 1986). Although some components of hardiness could be involved in reducing the negative effects of stress, they have not been reliably identified and thus it is not yet clear that components, such as commitment, control, and challenge, should be considered separately or treated as a single construct (Carver, 1989). As a result, hardiness was examined as a single construct in each of the present studies. The total score from responses to the Cognitive Hardiness subscale of Nowack's (1990) Stress Assessment Inventory was employed as a measure of hardiness in each study, rather than examining separate scores for commitment, control, and challenge.

**The benefits of self-deception in the aftermath of stress.** While stress is ubiquitous, people often view life from an undoubtedly overly optimistic point of view (Weinstein, 1980). Although frequently confronted with the threatening nature of the world, humans tend to hold an illusory perception of reality that allows life to be viewed through rose coloured glasses. Self-deception refers to the distorted ability to view situations in an extremely positive, yet unrealistic manner (Robinson & Ryff, 1999). According to Gur and Sackeim (1979), people are able to self-deceive by consciously focusing on one belief, while another belief (although perceived at another level of consciousness) is glossed over or ignored. Thus, people are able to view the world with a positive slant by subconsciously ignoring another aspect of reality. Self-deception is a

process that helps protect individuals from the blows of reality (Allport, 1937). Self-deception may have evolved among humans because it offers particular advantages; self-deception appears to increase feelings of happiness and productivity (Alexander, 1987; Gur & Sackeim, 1979; Lockard, 1980; Surbey, 2004) that would be more likely to result in survival and procreation. In contrast to traditional arguments that an awareness of one's faults is necessary for mental health, distortions of the world and self are adaptive in the sense that they improve one's ability to cope in the face of adversity (Taylor & Brown, 1988).

There is little doubt that maintaining a degree of self-deception has psychological health benefits. Research has demonstrated that depressed individuals are more likely to hold accurate views of reality, instead of deluding themselves with positive self-deceptions, which subsequently leads to more depressive symptomatology (Abramson & Alloy, 1981). According to Abramson and Alloy (1981), depressed individuals exhibit a reduced illusion of personal control that therefore leads them to believe that they play little, if any, role in dictating their pathways in life. Self-deception, in the form of optimistically biased views of oneself, is negatively correlated with a range of "negative" emotions, such as anxiety/panic, anger, contempt, guilt, hopelessness, remorse and shame (Flett, Blankstein, Plinter, & Bator, 1988; Gur & Sackeim, 1979).

Sackeim and Gur (1978) claim that self-deception is useful if individuals are confronted with information about themselves or the world that is difficult to accept. Clinically oriented research by Nachson (2001) revealed that self-deception may be a process utilised by victims of traumatic events in an attempt to repress memories of the ordeal. The traumatised individual is able to prevent the trauma from entering consciousness, thereby allowing them to maintain positive views of the self and reality



(Nachson, 2001). If mild self-deception is necessary to promote psychological health, then atypical levels of positive illusions or self-deception may result in psychopathology. It may be that highly stressful events somehow interfere with a person's normal ability to adaptively engage in self-deception, resulting in mental health problems (Surbey, 2004). The current studies aim to explore whether self-deception serves a protective function when confronted with threatening material such as overwhelming stress or trauma.

### **Positive illusions and mental health**

As a degree of self-deception confers mental health benefits, it seems plausible that mental health benefits arise when people hold positive illusions about the world, self, and others. According to Janoff-Bulman (1989a, 1989b), most people hold three basic positive illusions about themselves, others, and the world. Firstly, people have a tendency to believe in their own invulnerability and that the world is benevolent. The term benevolence of the world essentially encompasses the extent to which people believe that the world is a good place (benevolence of the world) and the extent that other people are viewed as kind, caring, and helpful (benevolence of people). Secondly, people tend to hold positive assumptions about the self. This assumption explores the degree to which individuals perceive themselves as good, worthy, and morally decent people that engage in appropriate behaviours. Thirdly, there is a tendency for people to perceive the world as meaningful. Meaningfulness of the world includes assumptions about justice in that there is a contingency between behaviours and outcomes (people get what they deserve). Meaningfulness of the world also covers assumptions about the

controllability and randomness of outcomes (Alexander, 1987; Gur & Sackeim, 1979; Lockard, 1980; Surbey, 2004).

The ways in which people interact with the world and others is largely influenced by these inner assumptions. It has been suggested that these positively biased beliefs allow individuals to function in the world with a sense of agency, approach the world with optimism and trust, and to feel safe and secure (Janoff-Bulman, 1989a). It is adaptive to hold these fundamental assumptions as they promote positive social interactions and increase emotional health (McCann & Pearlman, 1990), factors likely associated with higher chances of successful survival and reproduction. Although these basic assumptions are generally quite stable and rarely consciously examined, they can be reconsidered if a severe stressor challenges their reliability (Janoff-Bulman, 1992). Consistent with this, overwhelming stress and traumas can result in a realisation that humans are vulnerable, that mortality is inevitable, and that the world is not safe (Janoff-Bulman & Frieze, 1983). Evidence suggests that individuals who have experienced severe stress tend to hold more negative assumptions about themselves and the world, relative to those who have not (Janoff-Bulman, 1992; Roth & Newman, 1993). A longitudinal study (N = 100) using mothers of children receiving bone marrow transplantations (BMT) demonstrated that recent exposure to negative life events predicted more negative beliefs about the benevolence of the world, benevolence of people, and self-worth (Rini et al., 2004). However, this finding was largely mediated by reported distress levels. Findings from this study also indicated that mothers with a greater number of negative life events one year following BMT were significantly less likely to show positive changes in self-worth and benevolence scores. This suggests that exposure to recent negative life events may impede positive change in basic beliefs

following extreme stress. Using a hierarchical regression analysis, it was found that mothers who held higher self-worth and benevolence beliefs at the time of their child's BMT reported improved psychological and physical functioning one year post-surgery, relative to those participants that held more negative beliefs.

Several lines of evidence suggest that inner assumptions about the self, others, and world influence how individuals cope with stress (Goldenberg & Matheson, 2005; Janoff-Bulman & Frantz, 1997). According to Goldenberg and Matheson (2005) individuals who perceive others as benevolent generally have an inclination to utilise social support when dealing with stressful situations, relative to individuals who view others as malevolent. Further to this, individuals who hold assumptions that the world is unjust and unpredictable may engage in avoidance strategies in an attempt to reduce the threatening nature of the world (Goldenberg & Matheson, 2005; Janoff-Bulman & Frantz, 1997). Although numerous studies demonstrate that individuals exposed to traumatic and overwhelming stress experience a "shattering" of basic cognitive assumptions, other studies have yielded inconclusive and conflicting results (Franklin, Janoff-Buman, & Roberts, 1990; Overcash, Caloun, Cann & Tedeschi, 1996). For example, Overcash et al. (1996) found that non-victims ( $n = 25$ ) and victims of a major stressor ( $n = 25$ ; rape, armed robbery, death of loved one, sexual harassment, sexual abuse, or a shooting) reported no significant differences in basic assumptions as measured by a scale of basic beliefs called the World Assumption Scale (WAS).

World assumptions and core beliefs are influenced by a person's level of resilience (Farber, Schwartz, Schaper, Moonen & McDaniel, 2000). Using a sample of adults ( $N = 200$ ) diagnosed with HIV disease or AIDS, hardiness was linked to core beliefs as measured by the World Assumption Scale (WAS). This cross-sectional study

found that higher levels of hardiness were positively associated with several basic assumptions: namely, benevolence ratings of the world, benevolence ratings of people, randomness of outcomes, controllability, and high self-worth ratings (Farber et al., 2000). Specifically, the three hardiness dimensions (commitment, controllability, and challenge) were differentially associated with specific personal beliefs. Individuals high in the commitment dimension of hardiness tended to view themselves as worthy individuals and believed that the impersonal world was benevolent. Individuals high in the control dimension of hardiness tended to believe that people were benevolent and kind. This study also found that people high on the challenge dimension of hardiness tended to perceive the world as less controllable. These findings highlight the important role that basic assumptions and resilience factors have in stress reactions.

Worldviews and assumptions are also linked to the type of reactions received from others following emotional disclosure of stress or trauma (Hyman, Gold, & Cott, 2003; Littleton & Breikopf, 2006). Specifically, discussing adverse experiences with supportive people can afford resilience by providing a safe environment to express views about the self and world. Littleton and Breikopf (2006) speculated that people who have access to supportive relationships may feel more encouraged to discuss changes in their world assumptions following stress or trauma, which in effect, may provide opportunities to discredit or challenge negative core beliefs. Although significant empirical support for this prediction was not found, the authors speculated that limited variability in received support following disclosure may have accounted for this unexpected finding (Littleton & Breikopf, 2006). Using a sample of female sexual abuse victims ( $N = 172$ ), Hyman and colleagues (2003) suggested that individuals are better able to adjust following adverse events such as rape when they feel valued by

members of their support network (Self-Esteem Support as measured by the Interpersonal Support Evaluation List; ISEL). It has been argued that self-esteem support following extreme stress has the potential to prevent the development of negative core beliefs, such as low levels of self-worth. According to Janoff-Bulman (1992), engaging in trauma-related discussions provide opportunities for individuals to work through changes in world assumptions that commonly occur following overwhelming stressful events and traumas.

### **Predictions and significance of Study 1**

It was anticipated that the first study conducted herein would clarify some previously unresolved issues relating to disclosure, such as whether the type of reactions received from others following self-disclosure is related to mental health outcomes. Specifically, the goal of this first study was to extend the emotional-processing theory of PTSD by considering how disclosure, demographic factors, and a number of resilience factors are related to one's ability to recover from exposure to stressful events. In particular, this questionnaire study aimed to determine whether any specific relationships existed among resilience factors, disclosure, stressful life circumstances, appraisals of stressful events, and psychological health. This knowledge would be useful for social workers, psychologists, trauma counsellors, and others who work with victimised individuals or the family members of those exposed to adverse life events. Psychologists may be able to utilise this information when devising ways of helping individuals strengthen their ability to deal with stressful life circumstances in a productive manner.

The following hypotheses were tested:

**Hypothesis 1:** Individuals with higher levels of self-efficacy were expected to receive significantly more positive responses from others following stress-related discussions (Overall Confidants' Reactions to Disclosure), relative to those with lower self-efficacy.

**Hypothesis 2:** Individuals who received negative responses from others following stress-related discussions were expected to report significantly more negative beliefs about the self and world (World Assumptions Scale [WAS] subscale scores: Justice, Benevolence of People, Benevolence in the World, Randomness, Luck, Self-Worth, Controllability, and Self-Controllability), when compared to people who received more positive responses.

**Hypothesis 3:** Participants with higher levels of resilience (hardiness, self-deception, self-efficacy, and social support) were expected to report significantly fewer psychological symptoms (as measured by HADS Anxiety and HADS Depression scores). After ascertaining which resilience variable(s) were associated with psychological symptoms, the variables that best predicted HADS Anxiety and HADS Depression scores were explored.

**Hypothesis 4:** Participants with higher levels of resilience (hardiness, self-deception, self-efficacy, and social support) were expected to report significantly more positive beliefs about the self and world (higher WAS subscale scores) relative to those with lower levels of resilience. Furthermore, the resilience variable(s) that most accurately predicts WAS subscale scores (Justice, Benevolence of People, Benevolence in the

World, Randomness, Luck, Self-Worth, Controllability, and Self-Controllability) were explored.

**Hypothesis 5:** Individuals with higher levels of self-deception, as measured by the Self-Deception Questionnaire (SDQ), were expected to report significantly fewer depressive symptoms (as measured by the Hospital Anxiety and Depression Scale; HADS), relative to those with low SDQ self-deception scores.

**Hypothesis 6:** Individuals exposed to more stress over the past twelve months (as measured by the Holmes-Rahe Social Readjustment Rating Questionnaire; SRRQ) were expected to report lower self-deception scores, relative to individuals exposed to fewer stressors.

**Hypothesis 7:** Participants were expected to report better psychological health (lower HADS Anxiety and HADS Depression scores) if they were exposed to lower levels of stress (as measured by the SRRQ) and made more positive appraisals of such stressors. In addition, exposure to stress and appraisals were examined to determine which most accurately predicted HADS Anxiety and HADS Depression.

## CHAPTER 3

### Study 1: Method

#### Participants

Participants (N =109, 31 men and 78 women) were undergraduate students from James Cook University (JCU) and individuals from the wider community of Townsville who volunteered for the study. The mean age of participants was  $28.4 \pm 13.3$  (range 18 to 64 years). Other demographic information is displayed in Table 1.

Table 1. *Demographic characteristics of participants*

Variable name	Levels of variable	Frequency	Percentage
Marital status	Single or other (i.e. divorced, widowed)	65	59.6%
	Married/De-facto	44	40.4%
Employment status	Currently employed	60	55.0%
	Not working (eg. Student)	49	45.0%
Highest education attained	High school or lower	71	65.1%
	Trade or tafe certificate	19	17.4%
	University degree	19	17.4%

\* N = 109, no missing data

After demographic data collection, the type of stressful experiences reported by participants was recorded. Table 2 details the frequency (*f*) with which participants experienced a range of stressful life events. This table also provides descriptions of each stress category based on research by Overcash et al. (1996) and Ferguson and Lawrence (2000).



Table 2. *Frequency of stressful life events*

Stressful event	<i>f</i>	Description and example
Academic	12	Problems with academic work (eg. public speaking, exams)
Health (others)	5	Physical health problems of others (eg. heart attack, cancer)
Health (self)	5	Physical health problems of self (eg. heart attack, cancer)
Split (others)	5	Split, separation or divorce of others (eg. parents, siblings)
Split (self)	7	Split, separation or divorce of own relationship
Accidents	2	General accidents (eg. car crash)
Death (natural)	10	Death of close friend or relative by natural causes (eg. diseases, old age)
Death (unnatural)	2	Unnatural causes of death (eg. suicide, homicide)
Suicide	1	Suicidal thoughts or attempts by self or others
Infidelity	2	Partner being unfaithful
Distance	6	Separated from a loved one by distance (eg. overseas, leaving home)
Psychological health (self)	4	Psychological health problems (eg. eating disorders, PTSD, alcoholism)
Sexual attack	1	Sexual assault (eg. raped, sexual harassment)
Physical attack	2	Being attacked by someone with no implications of sexual assault (eg. hit, kidnapped, held at gun point)
Financial	2	Financial difficulties (eg. bankruptcy, gambling addictions)
Pregnancy	2	Fears relating to being pregnant (eg. giving birth, option of abortion)
Family	6	Familial difficulties (eg. childrearing, arguments)
Work	4	Problems at work (eg. burnout, being fired, business failure)
Travelling	2	Problems while travelling (eg. language barriers, missing flights)
Transition	5	Transition from university to workforce
Caring (others)	5	Caring for others (eg. victims of accidents, people with physical or psychological disorders)
Complex	15	Experiencing a combination of difficult situations

\* N = 105 (4 missing data)

Testing occurred over a ten month period. All participants were recruited via posters that were displayed around the JCU campus, on the JCU Psychology department notice board (to recruit participants from the Psychology Research Pool), and on notice

boards at local businesses. Individuals recruited from the Psychology Research Pool received credit points for participation. Posters for non-psychology students or the general public included brief information about the nature of the study, mentioned that participation involved filling in questionnaires taking about one hour to complete, that participants must be at least 18 years of age, and identified the researcher and research supervisor. Ethical approval for this research was granted by the Human Ethics Committee at James Cook University. Refer to Appendix A for a copy of ethical approval and the materials used in this study.

### **Standard measures employed in the first and subsequent studies**

**Demographic information.** The age, gender, highest level of education currently attained (high school or lower, trade/TAFE, or university degree), employment status (currently employed or currently unemployed), and marital status (single or other [i.e. divorced, widowed], and married/de-facto) were recorded.

**World Assumptions Scale (WAS).** The WAS is a 32-item scale that measures eight categories of assumptions by which individuals view themselves and the world: Self-Worth, Benevolence of the World, Benevolence of People, Justice, Controllability, Randomness, Self-Controllability, and Luck (Janoff-Bulman, 1989a). Participants were asked to indicate their responses using a 6-point scale, where 1 = strongly disagree and 6 = strongly agree (the opposite for reverse-scored items). Sample items included: ‘Misfortune is least likely to strike worthy, decent people’ and ‘People are naturally unfriendly and unkind’. Janoff-Bulman (1989b) reported that each of the subscales of the WAS has high alpha reliability coefficients that range from .81 to .87.

**The Cognitive Hardiness subscale of the Stress Assessment Inventory.** This 30-item scale assessed the attitudes and beliefs of participants with regard to life circumstances (Nowack, 1990). In particular, the Cognitive Hardiness subscale of the Stress Assessment Inventory measured the three components of hardiness as conceptualised by Kobassa (1979): 1) commitment (as opposed to alienation); 2) challenge (as opposed to threats); and 3) control. Items were assessed on a 4-point Likert scale ranging from 'not at all true' to 'exactly true'. Total scores ranged from 30 to 150, with higher scores indicating a higher degree of hardiness reported by the participant. Items included: 'I can remain calm when facing difficulties because I can rely on my coping abilities'. This scale has moderately high internal consistency (Cronbach's alpha = .85) and a high test-retest reliability of .75 (Nowack, 1990). For the purposes of the current research studies, only the global index score for the Hardiness scale was examined for each participant.

**The General Perceived Self-Efficacy Scale.** The General Perceived Self-Efficacy Scale is a 10-item measure of perceived self-efficacy or a person's ability to cope with stressful events (Jerusalem & Schwarzer, 1992). The scale items ranged from 'not at all true of me' to 'exactly true'. Items included: 'I can remain calm when facing difficulties because I can rely on my coping abilities' and 'I can usually handle whatever comes my way'. This scale has high internal consistency with Cronbach's alpha ranging from .75 to .90 (Schwarzer & Jerusalem, 1995).

**Social Support Scale.** This 11-item scale was developed to assess the degree of social support that individuals receive from significant others (Marshall & Barnett,

1993). Responses were recorded using a 6-point scale ranging from 'none of the time' to 'all of the time'. Items included: 'The people I care about make me feel that they care about me' and 'The people important to me accept me as I am'. This scale has been shown to have adequate test-retest reliability (.68) over a four month period and high reliability coefficient (Cronbach alpha = .91) (Marshall & Barnett, 1993).

**Self-deception Questionnaire (SDQ).** The SDQ is a 20-item questionnaire that measures one's tendency to self-deceive (Sackeim & Gur, 1979). This questionnaire consists of 7-point responses to 20 items that may be considered psychologically threatening. Sample items included: 'Do you ever feel guilty?' and 'Was your childhood a happy one?' Responses were made using a 7-point scale indicating agreement. Eight filler items were interspersed throughout the questionnaire in order to prevent participants from identifying the true purpose of this scale. Filler items were the same as those used in a study by Surbey and McNally (1997). The SDQ has adequate test-retest reliability (.86) and divergent validity with a range of other measures, such as the Other-Deception Questionnaire (Paulhus, 1986). For ease of understanding and interpretation, responses for this scale were reverse scored so that high self-deceivers received higher SDQ scores and low self-deceivers received lower SDQ scores.

**Hospital Anxiety and Depression Scale (HADS).** The HADS is a 14-item scale that was utilised to assess anxiety (7 items) and depression (7 items) levels in participants (Zigmond & Snaith, 1983). Using the HADS, participants indicated how they currently felt on a 4-point scale, with higher scores indicating greater clinical problems (No condition:  $\leq 7$ ; possible condition: = 8 to 10; definite condition:  $\geq 11$ ).

Items included: 'I feel tense or wound up' and 'I still enjoy the things I used to enjoy'. For the purposes of the current studies, the HADS Anxiety and HADS Depression subscale scores were examined separately.

### **Measures uniquely employed in Study 1**

**Appraisal of Life Events Scale (ALES).** The Appraisal of Life Events Scale measured primary appraisals of stressful life events in terms of threat, challenge and loss (Ferguson, Matthews, Cox, 1999). This scale has good test-retest reliability (range .90 to .48) and excellent internal reliabilities (range .91 to .75; Ferguson, Matthews & Cox, 1999). Participants received an average score for each subscale (threat, challenge, and loss) of this measure, indicating the degree to which they viewed their stressful life experience as threatening, challenging, or as a loss. This was calculated by dividing the total score of each subscale by the number of questions in that subscale. In other words, because there were six questions within the Threat subscale, the total threat score was divided by six to determine what the average score was for threat. In contrast, the total loss score was divided by four to determine the average score for loss as only four questions assessed this factor.

**Social Readjustment Rating Questionnaire (SRRQ).** The SRRQ was used to measure the amount of exposure to stress that individuals experienced over the past year (Holmes & Rahe, 1967). An exploration of stressors within the past twelve months was chosen under the recommendation of Clements and Turpin (1996), who suggested that one year is the optimal time period to examine when assessing life stress. The temporal reliability of this scale over a 2 year period was high for both the normal control group

(range from .96 to .89) and the psychiatric group of individuals (range from .91 to .70; Gerst, Grant, Yager & Sweetwood, 1978).

### **Measures developed for Study 1**

**Description of stressful or traumatic event.** Participants were asked to briefly write a description of “the most stressful event” that they have ever experienced. After data collection, the researcher and an experienced psychologist in the field of stress and trauma assigned each description to a stressful event category based on the coded events derived by other studies (Ferguson & Lawrence, 2000; Overcash et al. 1996). If participants reported more than one stressful event, and such events met criteria for different categories, decisions about category placement were based on the event that was expected to have more negative direct affect on the individual. Any discrepancies that emerged during the coding of variables were discussed until a consensus was met. There was high interrater reliability between coders as Cohen’s kappa statistic for the stressful event categories was .96 ( $p = 0.0005$ ).

**Disclosure measure.** The disclosure measure was adapted from a scale developed by Bolton and colleagues (2003). It assessed whether individuals received positive or negative reactions from others when they disclosed information about their traumas or stressful events. Participants were asked to indicate the total number of people with whom they had discussed their experiences with. Participants were also asked to indicate the degree to which they received positive or negative feedback from a range of confidants (partner, family members, friends, professional health workers/ counsellors). Separate reactions scores (ranging from 0 = extremely negative to 10 =

extremely positive) were obtained for each confidant, indicating the degree to which their reaction was positive or negative.

A total mean reaction score (ranging from 0 to 10) detailed the average reaction that participants experienced from all confidants, with higher scores being positive and lower scores being negative. This score was calculated by summing all reaction scores (family members, friends, partners, professionals) and dividing them by the number of confidants with whom participants discussed their stressor:

$$\text{Overall Confidants' Reactions to Disclosure} = \frac{\text{Sum of all reaction scores}}{\text{Number of confidants (maximum score = 4)}}$$

Initially, participants were placed into dichotomous categories of negative (average score less than 5) or positive reactions (average score greater than 5). As few participants received negative reactions when using this scoring system, the type of reactions received following disclosure were modified into three categories: Positive reactions to disclosure (a score of 8.01 or higher); Neutral reactions to disclosure (a score of 5.66 to 8.00); and Negative reactions to disclosure (a score of 5.65 or less). Such categorisation was based on the percentile cut-off system utilised by Church and colleagues (2002), in which a continuous variable was recoded into three categories by using the 25<sup>th</sup> percentile, interquartile range, and 75<sup>th</sup> percentile score.

## **Procedure**

Participants were recruited from James Cook University (JCU) and the wider community of Townsville and may or may not have experienced traumatic or stressful

events. At the beginning of the study, the researcher explained issues of confidentiality, informed consent and the right to withdraw at any time or not answer certain questions. Participants were informed in written form of the general goals of the study and what participation involved and were asked to read and sign the consent form before participating (refer to Appendix B).

After reading the information sheet and signing the consent form, participants completed a battery of questionnaires in order to assess attitudes, beliefs and previous life experiences. Questionnaires were administered in the same order for all participants. In addition to a demographic questionnaire, participants were asked to indicate how many people they had talked to about their traumas or stressful events. Participants were asked to indicate the degree to which such disclosure was met with negative or positive reactions. Participants were given questionnaires that focused on anxiety, depression, and stress (Social Readjustment Rating Questionnaire (SRRQ): Holmes & Rahe, 1967; Appraisal of Life Events Scale: Ferguson, Matthews & Cox, 1999; The Hospital Anxiety and Depression Scale (HADS): Zigmond & Snaith, 1983). Participants also filled in standard measures of basic beliefs (World Assumptions Scale (WAS): Janoff-Bulman, 1989a), and resilience (The Cognitive Hardiness subscale of the Stress Assessment Inventory: Nowack, 1990; The General Perceived Self-Efficacy Scale: Jerusalem & Schwarzer, 1992; Social Support Scale: Marshall & Barnett, 1993; and the Self-Deception Questionnaire (SDQ): Sackeim & Gur, 1979). These measures are widely used and are known to have reasonable reliability and validity.

Completion time for the battery of questionnaires was approximately 1 hour. The researcher indicated that participation in this study was voluntary and that participants had the right to withdraw from the study at any time. Participants were



verbally debriefed and were given a debriefing sheet to read at the end of the study (refer to Appendix C).

### **Power analysis**

Previous studies have found that disclosure has a positive and significant effect ( $d = .47$  or  $r = .23$ ) on well-being in terms of physical health, psychological health, physiological functions, and overall functioning (Smyth, 1998). The main aim of this study was to explore if any relationships existed among disclosure, stress, resilience variables, and psychological symptoms. Thus, Pearson correlations were the statistical procedures employed to ascertain statistical significance of predictions. Cohen's (1988, 1992) guidelines were used to determine the number of participants needed to obtain the recommended power level of .80 at the alpha level of 0.05. In order to reach a medium effect size ( $r = .30$ ), a total of 85 participants were needed for correlational analyses. Several regression analyses were also planned to be conducted and therefore another power analysis was executed. The required sample size for a regression analysis was calculated using G\*Power (Faul & Erdfelder, 1992) based on Cohen's (1992) medium effect size ( $f^2 = .15$ ). Confirming the previous finding, the subsequent regression analysis would require a minimum sample of 85 participants in order to detect a difference using four predictor variables with .80 power. A total of 108 participants would be needed to detect a .90 power difference using four predictors.

## CHAPTER 4

### Study 1: Results and Discussion

#### Data analysis

The Statistical Package for Social Sciences (SPSS v11) was employed and a significance level of .05 was adopted. Prior to commencing statistical tests, data were screened for the accuracy of entered responses, missing data, and violations of assumptions. All analyses using general linear models were assessed for kurtosis, skewness, linearity, homoscedasticity and the independence of variables. Non-parametric tests were used if any assumptions were violated in these tests. Skewness, Kurtosis, and the Kolmogorov-Smirnov Statistic was used to examine the normality of distributions. Box plots and histograms were also used to examine normality of other variables.

Statistical tests utilised included correlations, *t* tests, ANOVAs, ANCOVAs, MANCOVAs, and standard multiple regression analyses. Bonferroni corrections were applied when a large number of tests were conducted to correct for Type I errors. All results were assessed using two tailed tests.

#### Screening of data

Kurtosis and skewness were examined for each variable with an interval level of measurement. A variable is considered to be normally distributed if skewness values are between -2 and +2 and kurtosis is between -3 and +3 (Hutcheson & Sofronion, 1999). Results demonstrate that the majority of variables did not exceed acceptable kurtosis and skewness levels, which indicates normality. However, the number of people to whom participants disclosed (number of confidants) exceeded acceptable kurtosis levels, indicating that this variable was asymmetrical and significantly peaked (leptokurtic).

Caution was used when interpreting results relating to this variable. The Kolmogorov-Smirnov test was used to assess normality for the ordinal measures: SRRQ susceptibility rating (low, medium, and high) and category of disclosure reaction (positive, neutral, and negative). Normality was violated for both scales ( $p < .05$ ), indicating that these variables were not normally distributed. Demographic variables and all psychological measures were screened for incorrect data entries and missing data (refer to Appendix D). Examination of the data appeared to demonstrate a random pattern for missing values.

When conducting MANOVA, the assumptions of equal cell size, univariate normality, multivariate normality, equality of variance-covariance matrices, linearity, multicollinearity, singularity and homogeneity of variance were examined. Likewise, the assumptions of an adequate sample size, multicollinearity, normality, linearity, homoscedasticity, and outliers were examined for each regression analysis. The assumptions of normality, linearity, homogeneity of variance, and homogeneity of regression slopes were assessed when conducting analysis of covariance (ANCOVA), and normality and homogeneity of variance were assessed for analysis of variance (ANOVA) procedures. Any violation of assumptions will be reported in the relevant section, however, detailed information regarding assumptions that were met will not be reported.

### **Preliminary examinations**

Although specific hypothesis did not explore the impact of demographic variables, tests were conducted to determine whether these variables were related to the dependant measures. One-way between-groups ANOVAs with Tukey's HSD for post-

hoc analyses were conducted on each outcome measure to determine whether education level was related to the relevant measures. Results showed that that Benevolence of People scores were significantly different depending on the highest level of education completed by participants, with higher Benevolence of People scores reported by those that had attained a trade or TAFE certificate ( $M = 18.47 \pm 2.78$ ) rather than a high school certificate ( $M = 17.03 \pm 2.39$ ),  $F(2,106) = 3.12$ ,  $p = .05$ . The majority of tests were non-significant and are displayed in Appendix E.

Independent  $t$  tests were conducted on all outcome variables and the remaining demographic variables (employment status, gender, and marital status). Independent  $t$  tests showed that there were no significant differences in employment status (currently employed or currently unemployed) for any outcome measure. However, results demonstrated that the Total WAS score was significantly different across gender, with women ( $M = 117.44 \pm 13.63$ ) reporting significantly lower Total WAS scores than men ( $M = 124.06 \pm 12.48$ ),  $t(107) = 2.34$ ,  $p = .03$ . In addition, women ( $M = 13.05 \pm 3.34$ ) reported significantly lower scores on the WAS Controllability scores compared to men ( $M = 14.84 \pm 2.66$ ),  $t(107) = 2.62$ ,  $p = .009$ . With regards to HADS Anxiety scores, it was found that men ( $M = 5.55 \pm 3.01$ ) reported significantly lower levels of anxiety relative to women, ( $M = 8.35 \pm 3.69$ ),  $t(106) = 3.75$ ,  $p = .0001$ . No other gender differences were found (refer to Appendix E).

Independent  $t$  tests showed that there was a statistically significant difference in WAS Self-Controllability beliefs depending on marital status, with those in a de-facto or marriage relationship ( $M = 17.34 \pm 2.20$ ) reporting significantly higher levels of self-controllability relative to those who were not in a relationship ( $M = 16.14 \pm 2.61$ ),  $t(107) = -2.51$ ,  $p = .014$ . WAS Benevolence of the World scores were also significantly

different across groups, with significantly higher ratings reported by those in de-facto or married relationships ( $M = 17.32 \pm 2.88$ ) compared to single individuals ( $M = 15.49 \pm 3.34$ ),  $t(107) = -2.96$ ,  $p = .004$ . With regards to overall WAS scores, those in de-facto or married relationships ( $M = 122.84 \pm 13.03$ ) reported more positive beliefs about themselves and the world compared to single individuals ( $M = 116.94 \pm 13.55$ ),  $t(107) = -2.27$ ,  $p = .025$ . It was also found that participants who were not in a relationship ( $M = 15.57 \pm 6.64$ ) tended to report fewer threat appraisals of their stressful experiences relative to those in relationships ( $M = 18.86 \pm 7.14$ ),  $t(104) = -2.43$ ,  $p = .017$ . Participants who were not in a relationship ( $M = 12.29 \pm 7.12$ ) tended to report more challenge appraisals of their stressful experiences relative to those in relationships ( $M = 9.56 \pm 6.82$ ),  $t(104) = 1.97$ ,  $p = .052$ . No other significant differences were found (refer to Appendix E).

### **Relationships between resilience, disclosure, psychological health, and world assumptions**

Table 3 details the results of Pearson product-moment correlations between all continuous variables. As predicted (Hypothesis 1), individuals with higher levels of self-efficacy (as measured by the General Perceived Self-Efficacy Scale) indicated that they received significantly more positive responses from others following stress-related discussions (Overall Confidants' Reactions to Disclosure),  $r(102) = .35$ ,  $p = .0005$ . That is, higher levels of perceived support from others were associated with individuals feeling more capable of coping with the demands of stressful situations.

Table 3. *Pearson's correlations among all continuous variables*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
1. Age	1.00																										
2. SRRQ stress scores	-.04	1.00																									
3. Threat appraisals	.11	.21*	1.00																								
4. Challenge appraisals	-.26*	.05	-.02	1.00																							
5. Loss appraisals	.17	.22*	.37*	-.10	1.00																						
6. No. of confidants	.01	.07	.11	.08	.06	1.00																					
7. Family reaction	-.05	-.02	-.05	.18	-.11	.25*	1.00																				
8. Friend reaction	.05	-.01	-.02	.09	-.10	.18	.55*	1.00																			
9. Partner reaction	-.25*	-.20	-.23	.21	-.40*	.16	.53*	.21	1.00																		
10. Professional reaction	-.04	.06	-.09	.00	.14	.04	.65*	.46*	.23	1.00																	
11. Overall Confidant reaction	.06	.02	.01	.17	.11	.34*	.89*	.77*	.76*	.75*	1.00																
12. HADS Anxiety	.13	.24*	.28*	-.17	.47*	.04	-.02	.16	-.32*	.44*	-.18	1.00															
13. HADS Depression	.16	.17	.14	-.11	.47*	-.02	.01	-.08	-.21	.53*	-.10	.61*	1.00														
14. Justice	-.16	-.05	-.07	.08	-.16	-.08	.01	.19	.19	.18	.12	-.19*	-.15	1.00													
15. Benevolence in People	.19	.00	.05	.01	.06	.05	.01	.18	-.05	-.49*	.08	-.23*	-.32*	.18	1.00												
16. Randomness	-.09	-.02	-.01	.01	-.01	.21*	.26*	.22*	.03	-.02	.20*	.06	-.02	-.05	-.10	1.00											
17. Benevolence in the World	.34*	-.04	.08	.02	-.03	-.08	-.04	-.04	-.02	-.43*	-.04	-.19*	-.27*	.13	.58*	-.17	1.00										
18. Self-Worth	.05	-.09	.01	.17	-.26*	.08	.17	.22*	.31*	-.46*	.28*	-.55*	-.50*	.19*	.37*	.08	.28*	1.00									
19. Luck	.02	-.11	-.01	.04	-.13	.09	.12	.11	.24*	-.22	.19	-.33*	-.34*	.18	.37*	.28*	.27*	.43*	1.00								
20. Controllability	-.05	-.07	-.08	.12	-.10	-.02	.08	.18	.06	.24	.09	-.06	.02	.62*	.04	-.05	.05	.04	.14	1.00							
21. Self-Controllability	.12	-.09	.06	.02	.03	.01	-.15	-.14	-.01	-.40*	-.15	-.09	-.24*	.19	.31*	-.07	.37*	.27*	.27*	.29*	1.00						
22. Total WAS scores	.09	-.09	.02	.11	-.17	.08	.09	.23*	.17	-.34	.17	-.36*	-.39*	.59*	.59*	.27*	.52*	.60*	.65*	.50*	.54*	1.00					
23. Hardiness	-.09	-.00	-.04	.30*	-.21*	.08	.19	.21*	.26*	-.37*	.28*	-.63*	-.58*	.18	.34*	.05	.32*	.61*	.31*	-.04	.12	.39*	1.00				
24. Self-Efficacy	-.10	.03	.04	.36*	-.14	.12	.26*	.17	.41*	-.37*	.35*	-.47*	-.47*	.23*	.32*	.02	.30*	.55*	.41*	.04	.27*	.45*	.66*	1.00			
25. Social Support	-.11	.07	-.03	.13	-.16	.24*	.23*	.14	.26	-.27	.24*	-.10	-.39*	.03	.23*	-.01	.16	.24*	.34*	.11	.14	.23*	.29*	.31*	1.00		
26. Self-Deception	.15	-.28*	-.22*	-.04	-.27*	-.08	.03	-.02	.16	-.21	-.06	-.39*	-.21*	.01	.23*	-.07	.25*	.38*	.13	.05	.06	.21*	.35*	.23*	.09	1.00	

\* Correlation is significant at or below the 0.05 level (2-tailed); correlations greater than 0.26 are significant at a 0.01 level (2-tailed), N = 109

### **Relationship between world assumptions and confidants' reactions to disclosure**

It was predicted that participants in receipt of negative responses following stress-related discussions (Overall Confidants' Reactions to Disclosure) would report significantly lower World Assumption Scale (WAS) subscale scores when compared to people who received more positive responses (Hypothesis 2). Zero-order correlations (as displayed in Table 3) revealed that individuals who generally received more positive overall reactions from confidants reported more positive Self-Worth scores. It was also found that individuals reported significantly higher Randomness scores if they received more positive reactions from family members following stress-related disclosure. Participants who received more positive reactions from friends following stress-related disclosure had significantly higher Randomness and Self-Worth beliefs. Similarly, participants reported significantly higher levels of Self-Worth and Luck scores if their partner responded more positively following stress-related disclosure. Surprisingly, those who received more positive reactions from professional health workers following stress-related disclosure reported significantly lower Benevolence of People, Self-Worth, and Self-Controllability scores. No other significant effects were found.

A MANOVA with planned comparisons was conducted to determine if responses on WAS subscale scores were different depending on the type of reactions received from confidants following stress-related disclosure. For the purposes of this analysis, Overall Confidants' Reactions to Disclosure scores were categorised as negative ( $n = 21$ ; scores below 5.65), neutral ( $n = 54$ ; scores ranging from 5.66 to 8.00), or positive ( $n = 27$ ; scores of 8.01 or higher). Such categorisation was based on the percentile cut-off system utilised by Church and colleagues (2002), whereby a continuous variable was recoded into three categories by using the 25<sup>th</sup> percentile,

interquartile range, and 75<sup>th</sup> percentile score. Results indicated that participants reported different World Assumption Scale subscale scores depending on the type of reactions received by confidants,  $F(16, 184) = 1.69, p = .052$ , partial  $\eta^2 = .13$ . Further examination revealed that Self-Worth scores were the only subscale to significantly differ depending on the type of reactions received following stress-related disclosure,  $F(2, 99) = 4.84, p = .01$ ). Overall, planned contrasts revealed that those who received positive reactions from confidants reported significantly higher self-worth beliefs ( $M = 19.00, \pm 3.81$ ) compared to those who received negative reactions from others following stress-related disclosure ( $15.71 \pm 3.80$ ).

As mentioned earlier, significant gender differences were found for the WAS Controllability scores. Furthermore, WAS scores were significantly different across marital status groups (Benevolence of the World and Self-Controllability scores) and across participants with differing education levels (Benevolence of People scores). Therefore, a Multivariate Analysis of Covariance (MANCOVA) was conducted on Overall Confidants' Reactions to Disclosure and each of the WAS subscales controlling for gender, marital status, and education levels (covariates). For the purposes of this analysis, only participants in the top 25<sup>th</sup> percentile (positive reactions to disclosure,  $n = 27$ ) and bottom 25<sup>th</sup> percentile of cases (negative reactions to disclosure,  $n = 21$ ) were examined. Fifty-four participants that scored within the interquartile range (neutral reactions to disclosure) were not examined in this analysis. Furthermore, seven participants indicated that they had not spoken to anyone about their stressful event. These participants were not included in the analysis as the minimum required number of cases in each cell is equivalent to or greater than the number of dependent variables (Pallant, 2005), which is eight in the current analysis.



The MANCOVA met the majority of assumptions, however univariate normality was not found for the subscales of the WAS as the Kolmogorov-Smirnov statistic was significant ( $p < .05$ ) for each subscale. However Tabacknick and Fidell (2001) stated that a sample size of 20 or more participants in each cell should ensure ‘robustness’ of analyses. Multivariate outliers were found as the critical Mahalanobis distance value for nine dependent variables at alpha .001 ( $X^2$  critical = 27.88) was violated by two cases in this study. Because the two cases that scored higher than the critical value did not exceed the maximum value for Cook’s Distance (Tabacknick & Fidell, 2001), these cases were included in the analysis. As all other assumptions were met, the MANCOVA was conducted because this test is robust against minor violations to assumptions.

The MANCOVA revealed that positive and negative reactions to disclosure explained 86.9% of differences in WAS subscale scores after controlling for gender, marital status, and education level: Wilks’  $\lambda = .63$ ,  $F(8, 36) = 2.70$ ,  $p = .019$ , partial  $\eta^2 = .38$ . The results for each of the dependent variables were considered separately as can be seen in Table 4. After controlling for gender, marital status, and education, a significant difference emerged between groups in terms of the Self-Worth scores with higher scores being reported by those that received positive reactions from confidants following stress-related disclosure,  $F(1, 43) = 10.01$ ,  $p = .003$ , partial  $\eta^2 = .19$ . Participants who received positive reactions from confidants reported significantly higher Luck scores when compared to those that received negative reactions,  $F(1, 43) = 7.52$ ,  $p = .009$ , partial  $\eta^2 = .15$ . Participants reported a significant differences in Randomness scores, with individuals viewing events in the world as less predictable if

they received negative reactions from confidants following stress-related disclosure,  $F(1, 43) = 4.30, p = .044$ , partial  $\eta^2 = .09$ .

Results indicated that a significant overall difference in WAS subscale scores was not found for gender ( $F(8, 36) = 1.24, p = .30$ , partial  $\eta^2 = .22$ ), education level ( $F(8, 36) = .91, p = .52$ , partial  $\eta^2 = .17$ ), or marital status ( $F(8, 36) = 1.90, p = .091$ , partial  $\eta^2 = .30$ ).

Table 4. *Adjusted means and standard error of World Assumption Scale subscale scores as a function of Overall Confidants' Reactions to Disclosure, after controlling for gender, marital status, and education level*

	Positive reactions Mean ( $\pm$ SE)	Negative reactions Mean ( $\pm$ SE)	F(1, 43)	<i>p</i>
Justice	13.51 $\pm$ .75	11.86 $\pm$ .85	2.08	.16
Benevolence of People	17.96 $\pm$ .51	17.10 $\pm$ .58	1.25	.27
Randomness	14.52 $\pm$ .82	11.96 $\pm$ .93	4.30	.044*
Benevolence of the World	16.71 $\pm$ .59	16.99 $\pm$ .67	.10	.75
Self-Worth	19.10 $\pm$ .73	15.58 $\pm$ .83	10.01	.003***
Luck	12.84 $\pm$ .52	10.68 $\pm$ .59	7.52	.009**
Controllability	14.31 $\pm$ .63	13.27 $\pm$ .72	1.16	.29
Self-Controllability	16.48 $\pm$ .48	17.39 $\pm$ .54	1.59	.21

\*  $p < 0.05$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.005$  † trend toward significance, N = 109

### **Resilience and psychological health**

It was predicted that participants with higher resilience (hardiness, self-deception, self-efficacy, and social support) would report significantly lower levels of psychological health in terms of HADS Anxiety and HADS Depression scores

(Hypothesis 3). In support of this hypothesis, all but one zero-order correlation were significant (refer to Table 3). Specifically, individuals with high levels of hardiness reported significantly lower levels of HADS Anxiety ( $r(108) = -.63, p = .0005$ ) and HADS Depression scores ( $r(108) = -.58, p = .0005$ ). Furthermore, those who reported a higher degree of self-efficacy indicated that they had lower levels of HADS Anxiety ( $r(108) = -.47, p = .0005$ ) and HADS Depression ( $r(108) = -.47, p = .0005$ ). Individuals with higher levels of HADS Anxiety ( $r(108) = -.39, p = .0005$ ) and Depression ( $r(108) = -.21, p = .027$ ) reported significantly lower self-deception scores. Those who reported significantly lower HADS Depression scores also reported lower scores for social support ( $r(108) = -.39, p = .0005$ ).

**Resilience and HADS Anxiety.** After ascertaining the resilience variables that were associated with psychological health, two standard multiple regression analyses were conducted to explore which resilience variable best predicted HADS Anxiety and HADS Depression scores (Hypothesis 3 continued). The first standard multiple regression was conducted in order to determine the best combination of independent variables (hardiness, self-deception, self-efficacy, and social support) in predicting HADS Anxiety scores. Before running the regression analysis, the assumptions of linearity, homoscedasticity, and independence of residuals were tested. The critical Mahalanobis distance value for four independent variables at alpha .001 ( $X^2$  critical = 18.47) was violated by one case in this study. Because the case that scored higher than the critical value did not exceed the maximum value for Cook's Distance (Tabacknick & Fidell, 2001, pg. 69) and was not too high (25.93), this case was included in the analysis. No tolerance value was below .2, and therefore were not a concern for multicollinearity

(according to Pallant, 2005). Unfortunately, no universal cut-off system is used to determine multicollinearity. According to Pallant's (2005) suggestions, a Variance Inflation Factor (VIF) greater than 10 is indicative of multicollinearity whereas others have suggested that an average VIF of 1 or greater is a concern for multicollinearity (Bowerman & O'Connell, 1990). The average VIF in the current analysis was 1.14, thus multicollinearity may have biased the results of the regression model according to some researchers but not others (Bowerman & O'Connell, 1990; Pallant, 2005).

Table 5 gives the results of the standard regression analysis. In total, the combined resilience variables explained 42.2% of the variance in HADS Anxiety scores, Multiple R = .67,  $F(4,103) = 20.54$ ,  $p = .0005$ . Further examination revealed that hardiness ( $p = .0005$ ) and self-deception ( $p = .018$ ) made significant unique contributions to the prediction of anxiety scores. Therefore, high levels of hardiness and self-deception were significantly predictive of lower levels of anxiety.

Table 5. *Resilience predicting lower HADS Anxiety scores*

	B	SE B	$\beta$
Hardiness	-.16	.03	-.52***
Self-Efficacy	-.12	.10	-.12
Social Support	.05	.04	.10
Self-Deception	-.06	.02	-.19*

Note  $R^2 = .45$  ( $p < .0005$ ). \*  $p < .05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**Resilience and HADS Depression.** Another standard multiple regression analysis was conducted to explore whether hardiness, self-efficacy, social support, or self-deception (independent variables) significantly predicted HADS Depression scores (dependent variable). The assumptions of linearity, homoscedasticity, independence of

residuals, and multivariate outliers were met. The average VIF value was 1.08 which was not a concern for multicollinearity according to Pallant (2005), but slightly exceeded Bowerman and O'Connell's (1990) recommended level to assess multicollinearity.

Table 6 present the results of the standard regression analysis. The combined resilience variables explained 37.3% of the variance in HADS Depression scores, Multiple R = .63,  $F(4,103) = 16.90$ ,  $p = .0005$ . Further examination revealed that hardiness ( $p = .0005$ ) and social support ( $p = .005$ ) made significant unique contributions to the prediction of HADS Depression scores. Thus, high levels of hardiness and social support were significantly predictive of lower levels of depression.

Table 6. *Resilience predicting lower HADS Depression scores*

	B	SE B	$\beta$
Hardiness	-.11	.03	-.43***
Self-Efficacy	-.10	.09	-.11
Social Support	-.10	.03	-.23**
Self-Deception	-.004	.02	-.02

Note  $R^2 = .40$  ( $p < .0005$ ). \*  $p < .05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

### **Resilience and world assumptions**

As predicted (Hypothesis 4), individuals with higher resilience tended to report significantly more positive beliefs about the self and world as reflected by WAS subscale scores. As displayed in Table 3, individuals with higher levels of hardiness reported significantly higher Benevolence of People scores ( $r(109) = .34$ ,  $p = .0005$ ), Benevolence of the World scores ( $r(109) = .32$ ,  $p = .001$ ), Self-Worth scores ( $r(109) =$

.61,  $p = .0005$ ), and Luck scores ( $r(109) = .31, p = .001$ ). Individuals with higher levels of Self-Efficacy reported significantly higher scores for Justice ( $r(109) = .23, p = .018$ ), Benevolence of People ( $r(109) = .32, p = .001$ ), Benevolence of the World ( $r(109) = .30, p = .002$ ), Self-Worth ( $r(109) = .55, p = .0005$ ), Luck ( $r(109) = .41, p = .0005$ ), and Self-Controllability ( $r(109) = .27, p = .005$ ). Those who reported significantly higher levels of Social Support also reported higher scores for Benevolence of People ( $r(109) = .23, p = .014$ ), Self-Worth ( $r(109) = .24, p = .013$ ), and Luck ( $r(109) = .34, p = .0005$ ). Similarly, individuals with higher self-deception scores reported significantly higher scores for Benevolence of People ( $r(109) = .23, p = .014$ ), Benevolence of the World ( $r(109) = .25, p = .008$ ), and Self-Worth ( $r(109) = .38, p = .0005$ ). No other significant effects were found.

Standard multiple regression analyses were conducted to determine which resilience variable(s) would best predict the WAS subscale scores (Hypothesis 4 continued). All variables met the assumptions of linearity, homoscedasticity, and independence of residuals. Multicollinearity was met for all but two variables (Self-Worth and Luck). Specifically, the critical Mahalanobis distance value for four independent variables at alpha .001 ( $X^2$  critical = 18.47) was violated by one case for two variables (Self-Worth and Luck subscale scores). As the outlier case for the Self-Worth and Luck subscales did not exceed the maximum value for Cook's Distance (Tabacknick & Fidell, 2001, pg. 69) and were not too high, they were included in the analysis. Tolerance values were above .2 and the average VIF in each analysis was well below 10, therefore according to Pallant's (2005) recommendations, multicollinearity was not a concern. Results indicated that resilience variables were unable to

significantly predict Justice, Randomness, Controllability and Self-Controllability scores.

**Resilience and Benevolence of People.** A standard multiple regression analysis indicated that the combined resilience measures significantly explained 13.2% of the variance in Benevolence of People scores, Multiple  $R = .40$ ,  $F(4,104) = 5.11$ ,  $p = .001$ . However, further examination indicated that no resilience variable made a significant unique contribution to the prediction of the dependent variable. In a similar fashion, the combined resilience factors significantly explained 10.7% of the variance in Benevolence of People scores (Multiple  $R = .37$ ,  $F(4,104) = 4.24$ ,  $p = .003$ ), but no resilience factor made a statistically significant unique contribution to the equation.

**Resilience and Self-Worth.** Table 7 presents the results of the regression analyses for Self-Worth. A standard multiple regression showed that 42.2% of the variance in Self-Worth subscale scores were explained when all resilience variables were entered into the equation, Multiple  $R = .67$ ,  $F(4,104) = 20.71$ ,  $p = .0005$ . Further investigation revealed that hardiness, self-efficacy and self-deception all made a unique, and statistically significant, contribution to the prediction of Self-Worth scores. Therefore, high levels of hardiness, self-efficacy, and self-deception were significantly predictive of people viewing themselves as good, moral, and decent individuals.

Table 7. *Resilience predicting higher Self-Worth scores*

	B	SE B	$\beta$
Hardiness	.11	.03	.36***
Self-Efficacy	.26	.10	.25**
Social Support	.02	.04	.04
Self-Deception	.06	.02	.19*

Note  $R^2 = .44$  ( $p < .0005$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**Resilience and Luck.** Table 8 shows the results of a regression analysis for Luck scores. The combined resilience factors explained 19.1% of the variance in Luck subscale scores, Multiple  $R = .47$ ,  $F(4,104) = 7.39$ ,  $p = .0005$ . Further investigation revealed that self-efficacy ( $p = .007$ ) and social support ( $p = .012$ ) made a unique statistically significant contribution to the prediction of Luck scores. Therefore, individuals with high levels of self-efficacy and social support tended to believe that they were lucky and protected from ill fortune.

Table 8. *Resilience predicting higher Luck scores*

	B	SE B	$\beta$
Hardiness	.004	.03	.02
Self-Efficacy	.24	.09	.32*
Social Support	.08	.03	.23*
Self-Deception	.005	.02	.03

Note  $R^2 = .22$  ( $p < .0005$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

### Self-deception, stress exposure, and depression

It was predicted that individuals who reported higher levels of self-deception would report significantly lower HADS Depression scores relative to those with low



self-deception scores (Hypothesis 5). In support of this hypothesis, the zero-order correlation matrix (refer to Table 3) demonstrated that individuals who reported higher levels of HADS Depression were significantly lower self-deceivers,  $r(108) = -.21, p = .03$ . It was also predicted that individuals who reported more exposure to stress in the past twelve months would report lower self-deception scores, relative to individuals exposed to fewer stressors (Hypothesis 6). Consistent with this prediction, results indicated that participants exposed to a high level of stressful life events as measured by the Social Readjustment Rating Questionnaire (SSRQ) were significantly lower self-deceivers,  $r(109) = -.28, p = .004$ .

Although not the focus of the original predictions, self-deception scores were significantly related to other measures. Specifically, high self-deceivers reported significantly lower threat appraisals ( $r(106) = -.22, p = .022$ ), loss appraisals ( $r(106) = -.27, p = .005$ ), and HADS Anxiety scores ( $r(108) = -.39, p = .0005$ ). It was also found that high self-deceivers reported significantly higher scores on the measures of Benevolence of People ( $r(109) = .23, p = .014$ ), Benevolence of the World ( $r(109) = .25, p = .004$ ), Self-Worth ( $r(109) = .38, p = .0005$ ), Total WAS ( $r(109) = .21, p = .004$ ), hardiness ( $r(109) = .35, p = .0005$ ), and self-efficacy ( $r(109) = .23, p = .015$ ).

### **Psychological health, stress exposure, and cognitive appraisals**

It was predicted that participants would report better psychological health (lower HADS Anxiety and HADS Depression scores) if they were exposed to lower levels of stress (as measured by the Holmes-Rahe Social Readjustment Rating Questionnaire) and made more positive appraisals of such stressors (Hypothesis 7). Beginning with HADS Anxiety scores, zero-order correlations indicated that individuals experienced

significantly higher levels of anxiety if they reported higher exposure to stress in the past twelve months,  $r(108) = .24, p = .012$ . Participants also reported significantly higher levels of anxiety if they interpreted stressful events as threats ( $r(105) = .28, p = .004$ ) or losses ( $r(105) = .47, p = .0005$ ). HADS Anxiety scores were not significantly related to challenge appraisals, ( $r(105) = -.17, p = .076$ )

**Exposure to stress, cognitive appraisals, and HADS Anxiety.** Standard multiple regression analyses were conducted to determine whether exposure to stress or cognitive appraisals (threat, challenge, or losses) were the best predictor of HADS Anxiety scores (Hypothesis 8 continued). All variables met the assumptions of linearity, homoscedasticity, independence of residuals, and multicollinearity. The combined predictors explained 22.6% of the variance in HADS Anxiety Scores, Multiple R = .51,  $F(4,100) = 8.59, p = .0005$ . Further examination revealed that the loss appraisal subscale was the only predictor to make a significant unique contribution to the prediction of HADS Anxiety scores ( $p = .0005$ ). Therefore, individuals who tended to view stressful life events as losses were more likely to experience greater levels of anxiety.

**Exposure to stress, cognitive appraisals, and HADS Depression.** With regards to HADS Depression scores, zero-order correlations indicated that exposure to stress over the past twelve months was not significantly related to depression, ( $r(108) = .17, p = .071$ ). However, individuals who reported higher loss appraisals of stressful events experienced significantly higher levels of depression, ( $r(105) = .47, p = .0005$ ). HADS Depression scores were not significantly associated with threat ( $r(105) = .14, p =$

.16) or challenge appraisals ( $r(105) = -.11, p = .27$ ). In line with these results, a standard multiple regression analysis showed that the combined predictors explained 20.0% of the variance in HADS Depression scores, Multiple R = .48,  $F(4,100) = 7.45 p = .0005$ . Further examination revealed that the loss appraisal subscale was the only predictor to make a significant unique contribution to the prediction of HADS Depression scores ( $p = .0005$ ). Therefore, individuals tended to experience more depression if they viewed stressful life events as a loss.

## **Discussion**

### **The link between disclosure and self-efficacy**

In support of the first hypothesis, individuals who received more supportive responses from others when discussing stressful experiences were also found to have higher self-efficacy. That is, participants reported having a significantly higher perceived capability to regulate their personal functioning following stress and emotional disclosure of such stress. It is important to note that this study assessed participants at one time period. Therefore it is not possible to determine whether self-efficacy beliefs influenced perceptions of support following stress-related disclosure, or whether the type of reactions received from other people subsequently influenced self-efficacy beliefs. Longitudinal research needs to be conducted to determine the direction of this temporal relationship. Nevertheless, similar results were found by Sullivan and Bybee (1999), who reported that maintaining high self-efficacy beliefs provides an avenue for individuals to adopt adaptive coping strategies, such as increased access to supportive social networks. Being in receipt of adequate support following stress-related disclosures appears to reassure individuals that they are capable of withstanding

life stressors. This feeling of security would then also be associated with their resilience and improve their self-efficacy beliefs. Other related findings include those of Cohen and Syme (1985) who argued that the stability and predictability of supportive interpersonal relationships may improve a person's outlook on life, which in turn, may lead people to demonstrate resilience in times of stress.

Although the results are in line with the prediction, one cannot dismiss alternative explanations for the obtained relationship between self-efficacy and support. For example, the relationship may have occurred because some other unmeasured predictor for self-efficacy, such as attachment style, reduced a person's self-perceptions and ability to interact positively with others following stress-related disclosure. Evidence suggests that an upbringing characterised by parental dysfunction, instability, and disorganised attachment may impinge on a person's ability to benefit from supportive interactions in later life (Jones, 1996; Main, 1996). Further to this, Bowlby (1980) argued that secure attachment to family members has the potential to increase interpersonal relationships, positive coping abilities, self-worth, and self-efficacy. These results suggest that social support and self-efficacy beliefs increase among those with secure attachments and a functional family life. Therefore it seems reasonable to speculate that family environment and attachment styles may act as mediating variables for self-efficacy beliefs and perceived social support following stress-related disclosure. Additionally, Bonanno and Keltner (1997) suggested that people who express positive emotions are more likely to receive support from other people in their social environment. But does the expression of positive emotions lead to increased self-efficacy and positive perceptions of social support following disclosure, or does self-efficacy and supportive reactions following disclosure lead to increased expression of

positive feelings? Such questions highlight the importance of conducting experimental research in order to make assumptions about causality. Such tests could examine whether the relationship between self-efficacy and perceived social support following emotional disclosure depends on other personality characteristics that were not explored in this study. Nevertheless, the results provide preliminary support for the claim that individuals who choose to discuss stressful experiences with others are more likely to view such verbal exchanges as positive if they have a high level of self-efficacy.

### **Relationship between world assumptions and confidants' reactions to disclosure**

In partial support of Hypothesis 2, individuals were more likely to have negative worldviews and beliefs about themselves (lower WAS subscale scores) if they received negative responses from others when discussing their stressful life experiences. Overall, results suggested that well-adjusted views about the self and external world did not necessarily occur following therapy with professionals. However, a supportive response from a friend, family member, or partner when disclosing stress-related experiences was related to more positive world assumptions. In particular, individuals with supportive family members tended to believe in the random distribution of negative outcomes. Those who received support from friends following stress-related discussions tended to have more positive self-worth beliefs, whereas those who had supportive partners felt luckier and had higher self-worth.

Similar findings were obtained after controlling for gender, marital status, and education levels. When controlling for these variables, individuals reported significantly lower beliefs in self-worth, luck, and the random distribution of outcomes if they generally received negative reactions from people when discussing stressful events,

compared with individuals who had positive reactions from such discussions. These findings are similar to Hyman et al. (2003) who found that the type of reactions received from others following highly stressful or traumatic events has the potential to influence worldviews and beliefs about the self or others. Hyman et al. (2003) proposed that perceiving interpersonal relationships as supportive can prevent the development of negative core assumptions. Although this supports the results obtained here, there is no way of knowing unequivocally that stress-related disclosure was the cause of changes in core beliefs about the self and world. A limitation of the current study was that the cross-sectional design precluded definitive causal inferences. Thus, it is worth considering that the results with respect to disclosure and world assumption scores may have reflected the positivity bias: that is, happy, optimistic, and satisfied people were more inclined to rate their views of themselves and the world in a positive manner. Although relying on participant self-reports may have increased the possibility of inflated correlations among variables, it was neither feasible nor practical to conduct a randomised prospective study. Therefore, a retrospective approach appeared to be a useful way to begin the process of understanding the links between disclosure and world assumptions.

The results can also be examined by taking into consideration emotion processing theory. According to emotion processing theorists (Foa & Cahill, 2001; Foa & Kozak, 1986; Foa & Rothbaum, 1998; Foa, Rothbaum & Molnar, 1995), recovery from traumatic stress is impeded when individuals interpret the reactions of confidants as negative and believe that other people see them as incompetent. The results showed that individuals exposed to lower degrees of stress also have difficulty recovering if they perceive that they received negative reactions from others following stress-related

disclosure. This finding extends emotion processing theory by showing that this model can explain reactions to more subtle stressful life events in addition to major traumas. It is clear that some people do not respond to victims of extreme events in a supportive way, and perhaps some people are fearful of hurting the victim by “bringing up” issues (Foa & Rothbaum, 1998). Unfortunately, the intentions of others do not always reflect the impact of their behaviour, as individuals exposed to negative events may misinterpret such reactions as signs that others view them as incapable of coping. It is plausible that individuals who discuss stressful experiences with understanding and empathic listeners may experience a range of positive cognitive changes. For example, supportive discussions may promote the realisation that they were not to blame for the event. Furthermore, mistaken beliefs of personal incompetence may be corrected by others, which may increase the perception of oneself as a successful copier. Overall, the results from this analysis reflect the increasing importance of relationships with family, friends, partners, and professional health workers in terms of views that individual’s hold about themselves, the world, and other people. It appears as though individuals are able to maintain optimistic views about themselves and the external world if they feel supported by significant others in the aftermath of stress-related self-disclosure.

### **Resilience and psychological symptoms**

In support of Hypothesis 3, it was found that participants with higher resilience reported significantly fewer psychological symptoms. Specifically, individuals with higher levels of hardiness, self-efficacy, and self-deception reported significantly lower levels of anxiety and depression. It was also found that those with higher levels of social support reported significantly less depressive symptomatology. Further analyses

revealed that higher levels of hardiness and self-deception were the best predictors of fewer anxiety symptoms among participants. Research (Beasley et al., 2003) suggests that individuals who report high levels of hardiness are better able to withstand adversities and are therefore more likely to remain healthy following life stressors relative to less hardy individuals. Specifically, hardiness refers to the resistance that people have to stress, anxiety, and depression. Therefore, it makes sense that higher hardiness predicted fewer anxiety symptoms. This result somewhat mirrors that of Beasley, Thompson, and Davidson (2003) who found that high hardiness scores were significant predictors of low anxiety levels as measured by the SCL 90-R. Beasley et al. (2003) found that hardiness moderated the negative effects that life stress and emotion-orientated coping played in psychological health, however, moderation effects were not specifically explored in this analysis due to the size of the sample. Nevertheless, the results from the present study provide further credence for the direct effect of resilience on psychological health.

In addition to hardiness, self-deception scores were also found to make a significantly unique contribution to the prediction of reported anxiety levels. Specifically, participants with higher self-deception tended to report fewer anxiety symptoms as measured by the HADS Anxiety subscale. This supports Flett et al.'s (1988) finding that the Self Deception Questionnaire (SDQ) was negatively correlated with a range of self-reported unpleasant emotions, including panic feelings. Flett and colleagues (1988) found that individuals with higher self-deception scores tended to view the occurrence of negative emotions as less frequent, less intense, and less enduring when compared with participants with higher SDQ scores. It has been argued that maintaining self-deceptive illusions of the world and self is advantageous as it



allows individuals to persevere when faced with life stressors (Surbey, 2004; Taylor & Brown, 1988). Further to this, evidence suggests that individuals benefit from using self-deceptive processes if they are confronted with information about themselves which they find unpleasant and difficult to accept (Sackeim & Gur, 1978). For example, individuals tend to experience negative affective states such as increased levels of anxiety when they become aware of differences between their actual and ideal self.

Further tests were conducted to determine which resilience factors (hardiness, self-efficacy, social support, or self-deception) could best predict HADS Depression scores. Overall, only hardiness and social support scores uniquely predicted depression scores. This meant that individuals were less likely to report experiencing depressive symptoms if they maintained a high level of personal hardiness and access to supportive social networks. Although an abundance of research suggest that hardiness and social support positively influence psychological health (Beasley, Thompson, & Davidson, 2003; Blaney et al., 1991), fewer studies have examined their combined impact. Nevertheless, the protective effects of social support and hardiness in the reduction of psychological distress were obtained in a study of adult males diagnosed with HIV-1 (Blaney et al., 1991). Specifically, Blaney and colleagues (1991) found that cognitive hardiness and perceived social support were significant predictors of reduced levels of stress-related psychological distress, which is in line with the findings of the current study. To further corroborate the obtained results of this analysis, Beasley et al. (2003) found that university students with high hardiness scores reported lower levels of depression as measured by the SCL 90-R when compared to less hardy individuals. Therefore, previous researchers have also found evidence that a high level of social support is a significant predictor of low levels of reported depressive levels.

Although the aim of Hypothesis 3 was to evaluate how specific resilience factors may buffer the development of emotional difficulties, it is possible that unexplored biological or psychosocial factors may have contributed to reported levels of anxiety and depression. Results from a study of fire-fighters indicated that a range of factors should be examined when exploring the negative ramifications of stress, such as premorbid personality factors, previous psychiatric history, and family psychiatric background (McFarlane, 1989b). Furthermore, recent evidence suggests that neurobiological processes and gene-by-environment interactions confer resilience to stressful events and psychological conditions (Casi et al., 2003). A longitudinal study over twenty-six years found that individuals with two copies of the short 's' allele of the serotonin transporter gene (5-HTTLPR) reported more depressive symptomatology and suicidal ideation in response to stressful life circumstances in adulthood. They also found that childhood mistreatment predicted major depression in adulthood only among those with the 's' allele (Casi et al., 2003). Therefore, it is important to acknowledge that the variables explored in the current study provide partial explanations for stress-related psychological difficulties at best. Future researchers may wish to explore additional predictors when investigating the relationship between stress exposure and psychological conditions.

### **Resilience factors and world assumptions**

According to emotion processing theory, individuals exposed to trauma are confronted with overwhelming information which is inconsistent with previously held beliefs. Traumatic events may force a sudden realisation that humans are vulnerable, that mortality is inevitable, and that the world is not a safe haven (Janoff-Bulman &

Frieze, 1983). As the World Assumption Scale (WAS) was developed to explore changes in attitudes that occur in response to traumatic events, it was expected that the subscales should be positively associated with resilience. Individuals who remained resilient following exposure to stress or trauma were expected to endorse more positive worldviews and personal beliefs (Hypothesis 4). As predicted, individuals with higher resilience in terms of hardiness, self-efficacy, social support, and self-deception tended to report significantly more positive beliefs about the self and world as reflected by WAS subscale scores. As various resilience variables were linked to beliefs about the self and world, the resilience variables that best predicted WAS subscale scores were explored (Hypothesis 4 continued).

**Resilience, Benevolence of People, and Benevolence of the World.** Overall results showed that the combined resilience factors (hardiness, self-efficacy, social support, and self-deception) were significant predictors of Benevolence of People and Benevolence of the World scores. However, none of the resilience variables made a significant unique contribution to the prediction of these WAS subscale scores. These findings highlight the important role that resilience plays in one's perception of the kindness of others and belief that the impersonal world is a good and safe place. The results are somewhat in line with the results of Farber and colleagues (2000) who examined the role of hardiness in predicting the core beliefs of the WAS among sample adults diagnosed with HIV and AIDS. They found that hardiness significantly predicted both subscales of the WAS (Benevolence of People, and Benevolence of the World). However Farber et al. (2000) found that the hardiness dimension of commitment (maintaining a sense of purpose in life) specifically predicted Benevolence of the World

scores and the dimension of control (maintaining a sense of autonomy and ability to influence experiences) was able to account for further variance in the prediction of Benevolence of People scores. Taken together, these results highlight the important role that positive personality characteristics play in a person's beliefs about the impersonal world and other people.

**Resilience and Self-Worth.** Three resilience factors significantly predicted WAS Self-Worth scores, namely hardiness, self-efficacy and self-deception. More positive views of the self were predicted by high levels of hardiness, high self-efficacy, and high self-deception. The best predictor of Self-Worth scores in the current study was hardiness. The importance of hardiness in explaining positive views of the self was supported by the cross-sectional study of Farber and colleagues (2000) that found that 20% of the variance in self-worth beliefs was explained by overall hardiness scores. That and the current finding were not surprising as it makes sense that individuals who perceive themselves as good, moral, and decent individuals would also have a high degree of hardiness. It was also found that high levels of self-efficacy predicted more positive Self-Worth scores. This result is in line with the claim that efficacious thinking serves as a protective mechanism against loss of self-worth following adverse life events (Murphy, 1987; Regehr, Hill, Knott, & Sault, 2003).

Self-deception scores contributed a further small percent of the variance in Self-Worth scores. At first glance, self-deception and world assumptions may appear to be quite different processes. However, self-deception and self-worth beliefs both are in the service of concealing information and maintaining a degree of distortion in order to maintain mental health (Janoff-Bulman, 1989a; Surbey, 2004). Intellectually, people

may be aware of their limitations, past transgressions, and personal flaws and yet operate on the illusion that they are descent, honourable people (reflections of high Self-Worth). Likewise, researchers suggest that positive distortion in the form of self-deception is adaptive because it allows individuals to cope with adversities (Sackeim & Gur, 1978; Sackeim & Gur, 1983; Surbey, 2004). It is therefore not surprising that self-deception scores predicted self-worth beliefs as both processes involve the maintenance of a positive outlook of oneself and accordingly discourage dwelling on the negative aspects of the self in order to maintain psychological health.

**Resilience and Luck.** Luck scores were significantly predicted by two of the resilience variables. More specifically, individuals tended to believe that luck would protect them from misfortune if they had high levels of self-efficacy and a caring social support network. With regards to social support, one could speculate that individuals felt lucky to have supportive interpersonal ties, which in effect, may have protected them from the pathogenic effects of misfortune. The obtained link between high self-efficacy scores and greater endorsement of luck beliefs is in contrast with research which has explored the operation of “chance” as a dimension of locus of control. The term locus of control is often used interchangeably with self-efficacy. Although self-efficacy focuses on a person’s perceived ability to act competently and effectively, and locus of control focuses on the perception of control (Rotter, 1966; Bandura, 1977), there is a clear conceptual relationship between these two constructs. Like those with high self-efficacy, people with dominant levels of internal locus of control tend to believe that they can control their own outcomes by engaging in appropriate actions. This implies that people with low self-efficacy would have an external locus of control, and would

therefore believe that external agents (such as chance, luck, and fate) control their outcomes (Rotter, 1966). In contrast to expectations, results of this current study indicated that participants who had higher Luck beliefs tended to report higher self-efficacy. This finding was unexpected given the term luck, by definition, implies that no identifiable personal characteristic can account for a person's outcomes (Janoff-Bulman, 1989a) whereas self-efficacy refers to a person's belief that they can influence their outcomes by exerting some level of control (Aspinwall & Richter, 1999).

### **Self-deception, stress exposure, and depression**

In support of Hypothesis 5, the more individuals maintained optimistic distortions of reality (higher self-deception), the less likely they were to report depressive symptoms. Self-deception is a response style that allows individuals to keep threatening information from damaging their self-concept. It is a self-serving process that allows people to maintain a positive outlook on life by disallowing negative thoughts from reaching their conscious awareness (Sackeim & Gur, 1983). Individuals with low self-deception tend to make unfavourable though valid attributions about the self, a process which has been labelled *depressive realism* or the *sadder but wiser effect* (Alloy & Abramson, 1979; Sweeney, Anderson, & Bailey, 1986). Such terms aptly describe the characteristics of low self-deceivers, as research suggests that individuals with depression generally have difficulty or an inability to block realistic yet negative perceptions of reality and replace them with more positive thoughts (Sackeim & Gur, 1978; Surbey, 2004; Taylor & Armor, 1996; Taylor & Brown, 1988). On the whole, people tend to keep their failures and deficiencies hidden from other people, as broadcasting these shortcomings may lead to social rejection (Gurtman, 1986). With

this in mind, viewing the world without adaptive delusions of reality is perhaps an important key to understanding the development or maintenance of depression. Put another way, it appears as though a degree of self-deception has beneficial consequences in terms of mental health and well-being. Sackeim and Gur (1983) suggested that therapies aimed at adjusting cognitions to closer fit with reality may be misplaced as low self-deception is related to depression. Such a claim calls into question the type of benefits conferred by strict adherence to techniques set forth by cognitive behavioural therapies (CBT) or rational-emotive behavioural therapies (REBT), which specifically train individuals to identify and change cognitive biases to more realistic thoughts (Beck, 1967; Kinney, 2000). Some researchers have suggested that advocates of CBT and REBT may benefit from showing clients how to balance accurate views of reality while still maintaining positive views about themselves and the world (Taylor & Brown, 1988; Kinney, 2000).

Hypothesis 6 was also supported, as individuals who experienced more stress in the past year reported significantly lower self-deception, relative to individuals exposed to fewer stressors. This finding is related to that of Linden, Paulhus, and Dobson (1986) who found that low self-deceivers tended to report more frequent psychological distress (anxiety and depression) and physical health problems. If a degree of self-deception allows individuals to selectively ignore or deny unwanted emotions and physical health problems, it seems plausible that it also allows individuals to selectively discount or ignore their exposure to unwanted stressful life events. Thus, perhaps the reason that low self-deceivers reported greater exposure to stressful events is because they were unable to selectively ignore some of the stressors that they were exposed to, causing them to overestimate the number of stressful circumstances they experienced in the past

year. Such a claim supports the findings of Jamner and Schwartz (1986) who found that high self-deceivers tend to repress distress and negative emotions when exposed to stressful circumstances. Functionally, a degree of self-deception may help individuals cope with stressful life events. It is also possible that exposure to continuous negative life events reduces self-deception (Surbey, 2004).

Although not specifically predicted, a range of variables were found to be significantly linked to self-deception scores. Specifically, high self-deceivers were less inclined to view stressful events as threatening or as a loss, and reported experiencing fewer anxiety symptoms. It was also found that high self-deceivers generally saw themselves and the impersonal world in a positive light (high Self-Worth scores, hardiness, self-efficacy, Benevolence of People scores, Benevolence of the World scores, and Total WAS scores). Therefore, optimistic illusions appear to have the capacity to allay negative perceptions of both the self and appraisals of external events. Controlled trials need to be conducted in the future to determine whether treatment modalities would benefit from incorporating elements of self-deceptive illusions when working with clients who have low opinions of themselves. It seems necessary to examine whether therapies that focus less on reality and more on positive illusions are more helpful when compared to traditional CBT methods. Overall the obtained findings highlight some of the positive functions of self-deception, which may be considered when developing treatment protocols for those seeking help for mental health conditions.



### **Psychological health, stress exposure, and cognitive appraisals**

It was predicted that participants would report better psychological health (lower HADS Anxiety and HADS Depression scores) if they were exposed to lower levels of stress (as measured by the SRRQ) and made more positive appraisals of such stressors (Hypothesis 8). With regards to HADS Anxiety scores, results indicated that individuals experienced significantly higher levels of anxiety if they were exposed to higher levels of stress in the past twelve months, and viewed such stressors as threatening or as a loss. Numerous studies have highlighted that important role that stressful life events play in ones development or maintenance of anxiety symptoms or anxiety-related disorders (Eley & Stevenson, 2000; Finlay-Jones & Brown, 1981; Sandin, Chorto, Santed, & Valiente, 2004; Tiet et al., 2001; Venturello, Barsega, Maina, & Bogetto, 2002). In fact, evidence suggests that particular stressful events are more likely to lead to anxiety. Specifically, a link exists between anxiety and threat appraisals, with heightened levels of anxiety being reported by people who view stressors as threatening (Eley & Stevenson, 2000; Finlay-Jones & Brown, 1981). Interestingly, further analysis conducted in the current study indicated that loss appraisals were the most accurate predictor of anxiety symptoms. This finding highlights the importance of assessing cognitive appraisals of stressful life events in order to determine whether individuals are more vulnerable to developing anxiety-related emotional impairments (Lazarus & Folkman, 1984).

With regards to HADS Depression scores, correlations indicated that loss appraisals were significantly linked to depression scores. According to Finlay-Jones and Brown (1981), ongoing stressors that involve some form of loss (such as, little to no intimate relationships with others) tend to confer a risk of depressive symptomatology.

Interestingly, challenge and threat appraisals were not significantly associated with reported depression scores in the current study. It was also unexpected that exposure to stress was not significantly related to depression in this study as prior research has linked stress to increased depressive symptoms (Hooley & Gotlib, 2000; Kendler & Prescott, 1998; Kraaij, Arensman, & Spinhoven, 2002; Moos, Schutte, Brennan, & Moos, 2005; Paykel et al., 1969). Other researchers have suggested that adverse life events can protect individuals from the development or recurrence of depression. For example, Farmer and McGuffin (2003) found that exposure to moderate levels of stress over time increases a person's resilience to more severe or threatening stressors and can reduce vulnerability to depression. As the current study only explored the degree to which individuals were exposed to stressful events over the past twelve months, there is no way of knowing whether any participants were exposed to a protective amount of non-severe stressors in the preceding years. Therefore, it is possible that all participants experienced similar amounts of low-level, non-severe stressors throughout their lives (not including the past twelve months), which gave them the same level of resistance to developing depressive symptoms. In order to test this assumption, future research might assess the degree of exposure to stress that individuals experienced over several time periods (for example, the past twelve months, the past 5 years, and across the lifetime) and explore whether depression levels change in response to differing levels of stress exposure over time.

### **Summary and significance of this study**

An aim of this study was to extend emotion processing theory by exploring whether this model could explain reactions to more subtle stressful life events. Another

goal was to determine if resilience levels and past reactions to stress-related disclosure were related to psychological health and world assumptions. According to proponents of emotion processing theory, individuals overcome traumatic experiences by discussing the feared event within a safe environment and by focusing on information that is inconsistent with the feared memory (Foa & Kozak, 1986). As expected, individuals reported more positive beliefs about themselves, others, and the world if they received supportive responses from other people when they discussed their stress-related experiences. This study also demonstrated the importance of having a high degree of resilience in order to cope with stressors. It was found that individuals who viewed themselves and the world in a more positive light tended to also report having higher levels of resilience. Specifically, individuals with high levels of self-efficacy tended to believe that their behaviour and moral character influenced their response to stressful events. Individuals who reported higher levels of hardiness tended to believe that the world was a safe and caring place, and that other people were basically good. Furthermore, individuals who maintained positive views about their self-worth tended to have high levels of hardiness, self-efficacy, and self-deception. In addition, participants who felt lucky or blessed were also found to have high levels of self-efficacy and social support.

Results of this study highlighted that individuals who experienced lower levels of anxiety and depression tended to have higher resilience, more positive self-perceptions, and more positive appraisals of stressful events. Specifically, individuals who were exposed to a large number of stressful events, who interpreted such stressors as losses, and who had low levels of hardiness and self-deception were also found to generally report more anxiety symptoms. Individuals who reported more depressive symptoms

also had a tendency to perceive stressful events as threatening or as a loss, and had lower levels of hardiness, social support, self-deception, and self-worth. Thus, although different factors may have protected individuals from anxiety and depression, results suggest that optimistic beliefs about the self, constructive appraisals of external events, and a degree of resilience were linked to more positive mental health outcomes.

Overall, results highlighted the applicability of emotion processing theory to explain reactions to day-to-day stressors and suggested that emotional disclosure and resilience factors may be incorporated into this model. An interesting finding of this study was that emotional disclosure was related to overall well-being, while self-deception was also related to better mental health outcomes. A possible interpretation of this result is that it is helpful to purposely discuss stressful experiences under some conditions, however, there comes a time when it may be more beneficial to repress unwanted thoughts or memories through self-deception rather than continually rehashing negative experiences. Such findings could provide researchers, psychologists, and social workers with information that could be incorporated into existing treatment models and educational programs for stress-related conditions. For example, clinicians could tailor treatment programs to each client by recognising that some people benefit from engaging in lengthy stress-related disclosure while others may benefit from improving their degree of self-deception. As a degree of self-deception appears to be necessary for positive mental health, it seems as though counsellors could encourage clients to balance discussing accurate views of reality while still maintaining positive views about themselves and the world (Taylor & Brown, 1988; Kinney, 2000). If individuals are encouraged to view themselves and their environment in a more positive light, this may provide them with an opportunity to live up to this ideal (Krebs & Denton, 1997). This

study assessed a large sample of university students and individuals from the wider population with well-validated measures that were easy to understand and answer. Although a correlational, cross-sectional design was utilised, no known studies have examined the relationship between disclosure and the chosen resilience factors (hardiness, self-efficacy, social-support, and self-deception) with respect to psychological health following exposure to stressful life events. A strength of this study was that it focussed on specific 'positive' qualities and behaviours (emotional disclosure, hardiness, self-efficacy, social support, and self-deception), and explored how these factors were related to overall well-being and belief systems following stress exposure.

## CHAPTER 5

### **Study 2: Changes in resilience, physical health, and psychological health following written emotional disclosure**

Various studies have explored the links between stressful life events, disclosure, resilience, psychological difficulties, and somatic disturbances. This study was unique in using an experimental design to elucidate whether individuals reported better physical health, psychological health, basic beliefs, and personal growth following written emotional disclosure of stressful events. It also explored which resilience factors were related to any such improvements.

#### **Links between stress and physical health**

It is becoming increasingly recognised that prolonged exposure and activation of the stress response increases a person's risk of developing physical health difficulties due to its physiological effects on bodily systems (McFetridge & Yarandi, 1997; Santagostino et al., 1996; Selye, 1950, 1984). Although postulated for many years (Selye, 1950), the specific premise that stressful life events can negatively affect physical health was not integrated into an etiological theory until the pioneering work of Holmes and Rahe (1967). Since the development of life event scales, mounting research evidence suggests that stressful life circumstances are associated with impaired physical health. Research has demonstrated that chronic stress exposure or frequent, rapid exposure to stressful events can markedly increase sympathetic arousal levels, blood pressure, and heart rate, which can lead to a range of cardiac difficulties (Baum & Posluszny, 1999) including cardiac arrhythmia, myocardial ischemia (inadequate blood flow), angina pectoris, hypertension, formation of thrombi, and coronary heart disease

(Barlow & Rapee, 1997; Goliszek, 1997; Kopecky, 1998; Patterson et al., 1994; Viner, 1999). In addition, increased secretion of gastric juices following exposure to prolonged stress can result in various gastrointestinal difficulties, such as ulcers, diabetes, constipation, and chronic diarrhoea (Cunningham, 1997). Stress hormones released by the adrenal glands have also been linked to physical ailments such as allergies, asthma, muscle tension, and jaw pain (Farrington, 1997).

Cross-sectional and prospective studies of adults and adolescents have consistently demonstrated that somatic health is affected by an accumulation of adverse life experiences (Cohen et al., 1998; Funk & Houston, 1987; Siegel & Brown, 1988). For example, Siegel and Brown (1988) found that adolescent females (N = 364) exposed to negative life experiences had significantly more somatic difficulties, such as upper respiratory infections. Using a sample of participants judged to be in reasonable health (N = 276), Cohen and colleagues (1998) examined the impact that life stressors have with regards to vulnerability to common viruses. Participants were exposed to the cold virus via the use of nasal drops and were monitored during the quarantine phase. Results demonstrated that chronic stressors (persisting for greater than one month) were associated with increased risk of developing the common cold. Approximately 69% of participants in the high chronic stress condition developed colds whereas only 27% of those in the low chronic stress condition developed a cold. Funk and Houston (1987) conducted a retrospective study using male undergraduate psychology students (N = 117) and found a significant main effect of stressful life events on physical health problems, indicating that higher exposure to stress is associated with higher levels of illness. Although stressful life experiences are linked with the development of physical health difficulties, one must be cautious when interpreting the results of the

aforementioned cross-sectional studies. Causal inferences cannot be made as other factors may have contributed to the results.

### **The value of written emotional disclosure**

In the past few decades, psychologists and other health professionals have started to systematically assess the therapeutic nature of emotional disclosure via writing (Lepore & Smyth, 2002). Written disclosure overcomes many barriers, such as personal inhibitions and social constraints, which may prevent people from discussing stressful experiences with others (Lepore, Silver, Wortman, & Wayment, 1996). Groundbreaking research conducted by James Pennebaker and colleagues (Pennebaker, 1995; Pennebaker, 1997; Pennebaker & Beall, 1986; Pennebaker, Kiecolt-Glaser, & Glaser, 1988) led to the development of a writing paradigm whereby individuals are assigned to either a written emotional disclosure condition or a control condition, and are asked to write about specific topics for approximately 20 minutes over three or four days. Individuals randomly assigned to the written emotional disclosure condition generally engage in writing sessions about their deepest feelings or thoughts surrounding a traumatic experience or stressful life event, whereas participants in the control condition write about more mundane day-to-day experiences (Pennebaker, 1997).

Interesting beneficial effects of written disclosure have been obtained. However, written expression does not seem to work for some people and across all situations (Frattaroli, 2006; Gildron et al., 2002). Researchers have attempted to identify whether characteristics of participants or the types of administration procedures used for experimental disclosure differentially affect outcome variables. Smyth (1998) conducted a meta-analytic study (N = 13 studies) of written disclosure and found reliable



improvements in health (weighted effect sizes of  $r = 0.23$ ) when participants wrote about current traumatic events, when student populations were assessed, when studies consisted of a higher proportion of men, and when there were longer spaces between written disclosure sessions (i.e. participants experienced better outcomes if they wrote about stressors once a week rather than once a day). The impact of writing on overall reported health was not significantly affected by age, writing instructions (i.e. detailed versus non-specific), or the number of disclosure sessions completed by participants (Smyth, 1998). However these conclusions are based on a meta-analysis that did not include unpublished studies. A more recent and robust meta-analysis ( $N = 146$  studies) confirmed that written expression has the potential to improve emotional and physical health (Frattaroli, 2006). Frattaroli (2006) found that participants with a history of stress, trauma, or physical health problems were more likely to develop improved health following written disclosure. A methodological variable that enhanced the effect size of writing was using shorter follow-up periods of no greater than 1 month. Participants also reported greater overall health when they engaged in more disclosure sessions (3 or more sessions), wrote for longer (15 minutes or more), and when participants received detailed and specific writing instructions. Overall effect sizes for writing were also improved when participants were allowed to complete writing sessions at home or when participants were informed that the experimenter would not read what was written in sessions. Age, ethnicity, education level, mood, neuroticism, and optimism did not appear to significantly moderate the effect of written disclosure. Frattaroli (2006) found that the benefits of writing were not disrupted when participants were aware that their participation may involve writing about upsetting experiences. In contrast to Smyth (1998), Frattaroli (2006) found that increasing the space between writing sessions (from

daily to weekly) had little to no effect on outcome variables. Another conflicting result with Smyth's (1998) earlier meta-analysis was that gender was not significantly related to psychological or physical health. Although written emotional disclosure appears to be useful, further research needs to be conducted to determine which participant characteristics or administration procedures in the written disclosure paradigm significantly affect psychological and physical health.

**Improving physical health by written disclosure.** A large and growing literature has demonstrated that physical health improves following expressive writing. Such studies have been conducted on healthy undergraduate university students (Pennebaker, Kiecolt-Glaser, & Glaser, 1988), chronically ill individuals diagnosed with rheumatoid arthritis or asthma (Smyth, Stone, Hurewitz, & Kaell, 1999), breast cancer patients (Stanton et al., 2002), outpatient prostate cancer patients (Rosenberg et al., 2002), and maximum-security psychiatric prison inmates (Richards, Beal, Seagal, & Pennebaker, 2000). Even though people generally experience a degree of negative affect while engaging in the writing paradigm, such emotional expression has been found to improve physical health and affords the opportunity to work through traumatic life events (Kelly, Lumley, & Leisen, 1997).

A commonly reported salutary effect of expressive writing has been a reduction in self-reported physical health symptoms and sensations. Using a sample (N = 98) of male inmates incarcerated in a maximum-security prison for sex offences, participants randomly assigned to the traumatic written disclosure condition reported significantly more physical symptoms and sensations as measured by the Pennebaker Inventory of Limbic Languidness (PILL), when compared to inmates that did not engage in written

disclosure or wrote about trivial topics (Richards, Beal, Seagal, & Pennebaker, 2000). However, as no formal measure recorded the medication use of inmates at pre-test, or whether such individuals attended therapeutic sessions concurrently with this study, changes in physical health may have been attributed to factors other than written disclosure. Nonetheless, this study further supports the notion that traumatic written disclosure is effective in improving physical health.

Behavioural markers such as health visits, frequency of appointments, and overall health care utilisation are other examined outcomes of the written disclosure paradigm. Rosenberg and colleagues (2002) conducted a study on outpatient prostate cancer patients ( $N = 54$ ) and found a trend towards reduced health care utilisation at 6-months post-intervention among participants randomly assigned to the written disclosure condition, relative to participants assigned to the control group. Health care utilisation was measured in terms of the frequency with which patients' contacted or visited health care organisations and used medication. However, this study can be criticised for assuming that fewer visits at health care organisations is indicative of better health outcomes. As it is difficult to determine whether individuals were avoiding health visits even in the presence of genuine health concerns, one must be cautious when making meaningful interpretations of these results.

Physiological markers, such as cellular immune function and antibody production, have also been found to improve among individuals who have engaged in expressive writing interventions (Pennebaker, Kiecolt-Glaser, & Glaser, 1988; Petrie, Booth, Pennebaker, Davison, & Thomas, 1995). For example, a significant positive health benefit in immune function was observed among healthy undergraduate university students ( $N = 50$ ) who were randomly assigned to write about traumatic

experiences relative to control participants who wrote about trivial topics (Pennebaker, Kiecolt-Glaser, & Glaser, 1988). Specifically, proliferation rates of lymphocytes in response to mitogens (foreign substances in the body) differed significantly between expressive writers and the control group in the expected direction. This suggested that participants who engaged in written emotional disclosure of traumatic events were better equipped to deal with infectious bacteria or viruses. Further to this, high self-disclosers experienced the greatest improvement in mitogen response from baseline until the follow-up period six weeks later, when compared to low self-disclosers and the control participants. In a similar vein, Petrie and colleagues (1995) examined whether traumatic disclosure influenced the concentration levels of antibodies for individuals attending a vaccination program for the hepatitis B virus. Findings indicated that when compared to the control condition, the disclosure group exhibited significantly higher levels of hepatitis B antibodies at the follow-up period six months later. Thus, at least in the short term, written emotional disclosure appears to modulate some aspects of immunity to the hepatitis infection. It was also found that immediately after the writing intervention, the traumatic disclosure group displayed significantly lower CD4 lymphocytes (T helper cells) when compared to the control group. However, no additional significant immune changes were observed between groups. As baseline data were not collected, a cause and effect relationship cannot be assumed.

**Improving psychological health by written disclosure.** Until recent years, the impact of written disclosure on psychological health has received limited attention. However an ever increasing number of studies have attempted to explicate the connection between stress, psychological health, and the expressive writing paradigm.

Interestingly, repeated results suggest that the positive effects of written disclosure only emerge over time. For example, a study of female university students ( $N = 49$ ) revealed positive psychological effects of engaging in trauma-related writing for three consecutive days. Relative to control participants, disclosure participants reported significantly lower PTSD symptom severity scores and depression levels at the 4-week follow-up period (Sloan & Marx, 2004a). In a similar vein, Kovac and Range (2000) found that the psychological health of individuals experiencing a stressful life circumstance was positively affected by written expression. When examining undergraduate students ( $N = 40$ ) who recently lost a loved one to suicide, Kovac and Range (2000) concluded that suicidal grief reactions decreased between post-test and the 6-week follow-up among participants that wrote about their bereavement experience, whereas participants that wrote about a trivial topic did not do so.

It is important to note that several studies have failed to demonstrate positive effects of the written disclosure paradigm. For example, Walker, Nail, and Croyle (1999) did not find a significant positive effect of written disclosure over three days when examining a small sample of breast cancer patients. Rosenberg and colleagues (2002) found that the psychological symptoms, mood, and distress levels remained fairly stable among prostate cancer patients who engaged in written expression of stressful circumstances. There was not a significant difference in scores for the written disclosure condition and the control group. However, baseline scores on the psychological variables were quite high, pointing to the possibility of null results being due to a “ceiling effect”. In an analysis of unintentional or homicidal loss of a loved one ( $N = 64$ ), Range, Kovac, and Marion (2000) found that psychological health improved over time irrespective of whether participants engaged in written emotional disclosure. Thus,

participants reported less depression, subjective stress, general grief, and grief reactions arising from the bereavement irrespective of whether they were instructed to write about their loss or a trivial topic (Range, Kovac, & Marion, 2000).

### **Theories of written emotional disclosure**

Several theories have been proposed in an attempt to understand how writing about overwhelming events can lead to physical and psychological health. Two theories that are believed to account for the positive effect of written disclosure can collectively be called *cognitive models of adjustment* to stress or traumatic events. According to Horowitz's (1982, 1997) model of adjustment, people have a *completion tendency* to incorporate new information into their existing individual models (or beliefs) of reality. Thus, experiencing traumatic events and life adversities requires individuals to re-examine and possibly modify existing beliefs. This model also suggests that traumatic experiences are continually examined and maintained in short-term memory, which often results in re-experiencing symptoms such as nightmares or unwanted thoughts. Advocates of this approach suggest that recovery from negative events requires individuals to resolve the differences between previously held beliefs and beliefs acquired from traumatic or stressful experiences (Horowitz, 1997).

In a similar vein, Janoff-Bulman's (1989a, 1989b) theory of adjustment suggests that people generally hold three assumptions about the self and world that enables them to feel optimistic, secure, and safe (Janoff-Bulman, 1989; Janoff-Bulman, 1992). These assumptions are: 1) a belief in one's invulnerability and that the world is benevolent; 2) having a positive view of the self; and 3) perceiving the world as meaningful and comprehensible (Janoff-Bulman, 1989a; Janoff-Bulman, 1992; Janoff-Bulman & Frieze,

1983). Following overwhelming stressors or traumas, individuals can no longer maintain such assumptions as they do not adequately represent the world and self (Janoff-Bulman, 1989, 1992). According to Janoff-Bulman (1989b), because traumatic events are so inconsistent with these previously held assumptions, victims must learn to assimilate or accommodate the information acquired from traumatic experiences into their pre-existing assumptions. Researchers have suggested that written emotional disclosure may be a mechanism by which individuals can achieve this process of cognitive assimilation or accommodation. Writing about trauma-related thoughts and emotions has been found to provide a sense of structure and coherence to the experience, which allows the event to be more easily integrated into pre-existing beliefs (Smyth, True, & Souto, 2001).

*Exposure or emotional processing theories* have also been developed to explain the beneficial effects of the writing paradigm. Mowrer's (1960) two-factor theory of avoidance behaviour was initially developed to understand mechanisms involved in decreasing stress. Proponents of the two-factor model found that negative unconditioned stimuli (UCS) are able to produce unconditioned responses (UR), such as fear or stress. Over time, neutral stimuli become associated with the UCS and are able to elicit fear or stress (conditioned response; CR). Instead of experiencing fear (CR) and engaging in avoidance behaviours, individuals can work through their emotional traumas via exposure treatment (Sloan & Marx, 2004b). In accordance with the two-factor theory, expressive writing can be viewed as a form of exposure treatment that allows individuals to confront their traumas or stressful life events, re-evaluate such experiences, and eventually experience stress reduction (Kloss & Lisman, 2002). Proponents of this approach suggest that inhibiting emotions can lead to psychological

illnesses and physical impairments, which in effect means that emotionally expressing previously inhibited feelings via writing should reduce stress and overall health (Pennebaker, 1989).

A more recent *exposure or emotional processing theory* of stressful and traumatic experiences was developed by Foa and Kozak (1986). Proponents of emotion processing theory proposed that traumatic events challenge people's beliefs about the world and self (Foa & Kozak, 1986). Thus, this would suggest that people who experience more stress and trauma are more likely to have more negative assumptions about themselves and the world. According to emotion processing theorists, individuals develop a number of stimulus-danger associations in memory following exposure to traumatic or stressful events. Thus, a wide range of people, events, and places are viewed as dangerous even if such stimuli have little to no association with the original trauma. In order to alleviate such fears, individuals need to be confronted with the feared event (exposure techniques) within a safe environment and given information that is incompatible with the feared event. Focussing on information that is inconsistent with the feared memory is expected to result in reduced fear responses (Foa & Rothbaum, 1998). According to this model, adjustment to stress occurs when people process both emotional reactions to stress and engage in cognitive processing. Cognitive processing refers to a person's ability to make sense of an event or to increase their understanding and acceptance of the experience (Ullrich & Lutgendorf, 2002). Some researchers have suggested that written emotional disclosure provides individuals with the opportunity to more appropriately process the feared stimuli, which may lead to a reduction in distress (Klein & Boals, 2001; Pennebaker, 1997). In line with this notion, Sloan, Marx, and Epstein (2005) found that repeated exposure to a traumatic experience through written



disclosure resulted in significant reductions in PTSD symptoms, depression, and self-reported physical health symptoms among a sample ( $N = 79$ ) of undergraduate students.

### **Limitations and extensions of the writing paradigm**

Although the written disclosure procedure is an easily administered and relatively brief method that appears to alleviate somatic health difficulties and psychological distress, some limits of this approach deserve mention. A limitation of Pennebaker's original conception of the written disclosure paradigm (Pennebaker & Beall, 1986) is the non-directive nature of writing instructions. One of the first studies conducted by Pennebaker, Kiecolt-Glaser, and Glaser (1988, p. 240) in this area used the following instructions for the disclosure writing condition:

During each of the four writing days, I want you to write about the most traumatic and upsetting experiences of your entire life. You can write on different topics each day or on the same topic for all four days. The important thing is that you write about your deepest thoughts and feelings. Ideally, whatever you write about should deal with an event or experience that you have not talked with others about in detail.

Examination of the aforementioned instructions shows that participants were encouraged to discuss thoughts and emotions pertaining to a life trauma or upsetting situation, however such instructions did not give much guidance as to whether it was more beneficial to write in the past tense, future tense, to discuss the facts, to write in points or in a sentence format, and so on. Several studies have attempted to explore the influence of directly structuring writing instructions (Kloss & Lisman, 2002; Paez, Velasco, & Gonzelez, 1999; Stanton et al., 2002). For example, a study of undergraduate psychology students ( $N = 50$ ) revealed that participants who wrote about

either previously disclosed or undisclosed traumatic events reported similar intrusive and avoidant thoughts after writing when compared to individuals who were given instructions to write about a recent positive social event (Paez, Velasco, & Gonzalez, 1999). More recently, Kloss and Lisman (2002) conducted a study whereby undergraduate university students were randomly assigned to one of three conditions that had different writing instructions. In one condition, participants were asked to engage in expressive writing about a traumatic event or stressful experience.

Participants in the control condition wrote about an innocuous topic, and the final group of participants were asked to discuss positive events that they had experienced via writing. Though not expected, findings indicated that state anxiety levels for participants in the trauma disclosure condition were significantly higher at the 9-week follow-up period compared to baseline levels. Further to this, physical health (PILL physical symptoms, health visits, reported sick days, and minor illnesses) were not significantly different across conditions at the follow-up period. Although the findings of both investigations did not provide positive support for the writing paradigm, these studies did stimulate other researchers to explore whether beneficial outcomes of expressive writing are influenced by the type of instructions given to participants.

Consistent with the aforementioned statement, a study on stage I or II breast cancer patients explored whether Pennebaker's standard instructions for writing sessions produced different outcomes among patients when compared to: 1) participants that discussed factual information relating to cancer and its corresponding medical treatment, or 2) participants that were encouraged to extract beneficial side-effects from their diagnosis (Stanton et al., 2002). No significant difference emerged between conditions on self-reported physical symptoms at a 1 month follow-up period, however, groups did

significantly differ on self-reported somatic symptoms and cancer-related medical visits at the 3 month follow-up. More specifically, participants who wrote in accordance with Pennebaker's original writing instructions reported significantly fewer physical symptoms ( $M = 16.99 \pm 3.24$ ) and cancer-related medical visits ( $M = .40 \pm .42$ ) at 3 months, when compared to those who wrote about factual information or the beneficial consequences of their condition. However, expressive writing tailored to focus on the positive aspects of a medical diagnosis did result in fewer physical symptoms ( $M = 22.30, \pm 3.04$ ) and cancer-related medical visits ( $M = .90, \pm .40$ ) when compared to those who wrote about factual information surrounding their diagnosis (physical symptoms:  $M = 30.16, \pm 3.47$ ; cancer-related medical visits:  $M = 2.20, \pm .45$ ). Although slightly different experimental conditions and variables were utilised, the aim of Study 2 was to partially extend this research by exploring whether such findings can be generalised to a healthy sample of university students or members of the general population. Directing attention to the positive aspects of stressors may potentially "undo" prolonged distress that was evoked by stressful events (Fredrickson & Branigan, 2001).

### **Personal growth following exposure to stress**

An extensive body of literature has demonstrated various negative psychological and physical health consequences of overwhelming stress and trauma. For example, individuals exposed to extreme stressors may develop depression, somatic complaints (such as respiratory difficulties), relationship difficulties, substance-related conditions, heightened anxiety, and avoidance behaviours (Hooley & Gotlib, 2000; Kilpatrick, Saunders, Veronen, Best, & Von, 1987; Litz & Keane, 1989; Mazure, 1998; Riggs,

2000; Sandin, Chorot Santed, & Valiente, 2004, Siegel & Brown, 1988). However, researchers in the past decade have begun to focus on the positive ways in which people have changed in the aftermath of negative life events (Best, Streisand, Catania, & Kazak, 2001; Cadell, 2003; Calhoun, Cann, Tedeschi, & McMillan, 2000; Cordova, Cunningham, Carlson & Andrykowski, 2001; Helgeson, Reynolds, & Tomich, 2006; Lev-Wiesel & Amir, 2003; Tashiro & Fraier, 2003; Wild & Paivio, 2003). Although stressful life events are often regarded as having a deleterious impact on individuals, researchers have suggested that successfully confronting overwhelming events may bestow an opportunity for personal development (Moos & Schaefer, 1993).

*Posttraumatic growth* refers to the process of growing beyond previous levels of psychological functioning in response to a negative life event (Calhoun, Cann, Tedeschi, & McMillan, 2000). Various self-report questionnaires have been developed in order to assess the degree to which individuals experience personal growth following exposure to stress or trauma. For example, Park, Cohen, and Murch (1996) created the Stress-Related Growth Scale (SRGS). The SRGS is a 50 item scale that measures changes in social relationships, personal resources, and coping skills following exposure to stressful events. Tedeschi and Calhoun (1996) developed the Posttraumatic Growth Inventory (PTGI), a 21 item scale, which explores whether people experience stress-related growth with regards to spiritual beliefs, personal strength, possibilities for the future, and relationships with others. However, people can exhibit positive growth in a range of domains following adversity, such as increased self-reliance, feeling more self-assured, a revision of values, strengthening of personal relationships, changes in life priorities, and a greater appreciation of life (Tashiro & Frazier, 2003). Unfortunately, both the SGRS and PTGI are designed as unipolar response scales (ie. are positively worded) and

therefore do not examine whether individuals experience any negative change on assessed domains. Both scales only examine if participants experience a positive change following stressful experience or if no change occurs. Thus both scales have limitations with regards to examining growth. However, the PTGI is considered to be the most widely utilised growth measure due to its high internal consistency and test-retest reliability (Joseph & Butler, 2010), and thus it was used in the current doctorate. The PTGI was also elected versus the 50-item SRGS because of concerns related to respondent fatigue.

A longitudinal study by Rini and colleagues (2004) aimed to identify whether individuals benefit psychologically from adverse events in terms of developing more positive basic beliefs following stress. This study was conducted on a group of mothers (N = 100) who had a child that was undergoing a life-threatening and stressful bone marrow transplantation procedure. Results of hierarchical regression analyses revealed that mothers with a history of traumatic events reported more positive changes in self-worth beliefs from time 1 (during the child's hospitalisation for bone marrow transplantation) to time 2 (approximately 12 months later). However, mothers who experienced a greater number of negative life events at time 2 reported significant reductions in their self-worth beliefs. Although this study did not measure basic beliefs prior to the child's medical procedure, results seem to suggest that people benefit from questioning their beliefs when exposed to overwhelming, negative events. This study also found that mothers with more positive self-worth beliefs tended to report more positive psychological functioning at the time of their child's medical procedure and experienced further improvement in psychological health one year later. An increase in

benevolence beliefs from time 1 to time 2 was also linked to improvements in physical functioning.

Although the study by Rini and colleagues (2004) did not examine written disclosure, it highlights how individuals can experience personal growth in the aftermath of stressful or traumatic events. Further research should be conducted to examine posttraumatic growth following written disclosure to further understanding of the processes people use as they struggle with the aftermath of stress and trauma. Creating a written account of stressful events may provide a sense of resolution (Pennebaker & Seagal, 1999) or enable people to see their experience as worthwhile as it brought them closer to their loved ones. Written expression may also allow individuals to identify their courage and resilience in response to overwhelming events, or alternatively they may recognise what truly is important to them in life (McFarland, & Alvaro, 2000). Disclosure through writing may also provide an avenue for individuals to develop more adaptive appraisals of past life events (Kennedy-Moore & Watson, 2001).

### **Significance of Study 2 and hypotheses**

Examining the consequence of stress and trauma is a complex and sensitive process and one not easily addressed even with carefully designed questionnaires and measures. As the chosen questionnaires and format for this study encouraged participants to examine previous traumatic experiences or upsetting life events, there was a potential for participants to be negatively effected by participating in this research. However, the proposed study was designed in a way to try to minimise distress levels. Participants were informed that the studies may involve discussing personally-upsetting traumatic events and had the right to withdraw from the study. It was anticipated that

the benefits of this research would outweigh the potential costs. Neglecting to conduct research in the areas of stress and trauma would restrict the acquisition of meaningful information that could be incorporated into existing treatment programs for those struggling in the aftermath of adverse life events.

The aim of this study was to extend emotion processing theory by exploring whether recovery from stress and trauma was enhanced following written emotional disclosure and was related to resilience. This study was unique in using an experimental design to elucidate whether individuals reported better physical health, psychological health, basic beliefs, and personal growth following written emotional disclosure of stressful events. It additionally explored whether such improvements were related to hardiness, self-efficacy, social support, and self-deception. In addition, detailed writing instructions were developed for this study, as previous researchers have suggested that individuals are more likely to benefit from the written disclosure process if they receive direct questions or examples in the writing instructions (Broderick et al., 2004; Frattaroli, 2006). Specifically, participants in the written disclosure condition received instructions that asked them to describe their thoughts and emotions surrounding their most stressful experience, to write about ways to handle this situation in the future, and to describe the positive consequences of such experiences.

The specific predictions tested were:

**Hypothesis 1:** In line with predictions in Study 1, individuals with higher resilience at the start of the study were expected to report fewer psychological symptoms (HADS Anxiety, HADS Depression), fewer physical health problems (PILL scores), more

positive appraisals, greater posttraumatic growth, and more positive assumptions about the self and world (Total WAS score) at the start of the study.

**Hypothesis 2:** Individuals who wrote about their most stressful life experience (Written Disclosure condition) were expected to report better psychological and physical health at the end of the study, compared to individuals who wrote about non-stressful activities (Control condition).

**Hypothesis 3:** Participants who wrote about stressful experiences were expected to report improved physical and psychological health over the course of the experiment if they developed greater hardiness and self-efficacy from the start to the end of the study. The best predictor of improvement was also examined.



## CHAPTER 6

### Study 2: Method

#### Participants

A total of 90 participants (29 men and 61 women) from the community of Townsville were recruited via newspaper advertisements and posters at James Cook University (JCU). Participants recruited from the Psychology Department at James Cook University received credit points for participation. The mean age of volunteer participants was  $33.63 \pm 14.92$  (range 18 to 68 years). Other demographic information is displayed in Table 9.

Table 9. *Demographic characteristics of participants in Study 2*

Variable name	Levels of variable	Frequency(f)	Percentage
Marital status	Not in a relationship	41	45.6%
	In a relationship	49	54.4%
Employment status	Currently unemployed	27	30.0 %
	Full-time or part-time worker	63	70.0 %
Highest education attained	High school or lower	43	47.8 %
	Trade or tafe certificate	25	27.8 %
	University degree	22	24.4 %

\* N = 90 (no missing data)

The “most stressful life experience” reported by participants were recorded. Table 10 details the frequency with which participants experienced a range of stressful life events ( $f$  = overall frequency,  $wf$  = frequency for written disclosure group,  $cf$  = frequency for control group). This table provides descriptions and examples of each category based on research by Ferguson and Lawrence (2000) and Overcash et al.

(1996). It was not possible to match groups as data were collected over a prolonged period (18 months). Random assignment was used to assign participants to the written disclosure and control condition, but it is clear from Table 10 that participants were quite evenly distributed across these stressful event categories.

Table 10. *Frequency of stressful life events reported by Study 2 participants*

Stressful event	<i>f</i>	<i>wf</i>	<i>cf</i>	Description and example
Academic	2	0	2	Problems with academic work (eg. public speaking, exams)
Physical health (others)	7	3	4	Physical health problems of others (eg. heart attack, cancer)
Physical health (self)	4	2	2	Physical health problems of self (eg. heart attack, cancer)
Split (others)	2	1	1	Split, separation or divorce of others (eg. parents, siblings)
Split (self)	1	1	0	Split, separation or divorce of own relationship
Accidents	2	1	1	General accidents (eg. car crash)
Death	18	11	7	Death of close friend or relative (eg. diseases, old age, murdered)
Suicide	6	1	5	Suicidal thoughts or attempts by self or others
Infidelity	2	1	1	Partner being unfaithful
Distance	4	1	3	Separated from a loved one by distance (eg. overseas, leaving home)
Psychological health (self)	3	2	1	Psychological health problems (eg. eating disorders, PTSD, alcoholism)
Psychological health (others)	2	1	1	Psychological health problems (eg. eating disorders, PTSD, alcoholism)
Sexual attack	6	3	3	Sexual assault (eg. raped, sexual harassment)
Physical attack	7	5	2	Being attacked by someone with no implications of sexual assault (eg. hit, kidnapped, held at gun point)
Financial	2	1	1	Financial difficulties (eg. bankruptcy, gambling addictions)
Pregnancy	3	2	1	Fears relating to being pregnant (eg. giving birth, option of abortion)
Family	5	0	2	Familial difficulties (eg. childrearing, arguments)
Complex	14	3	4	Experiencing a combination of difficult situations

\* N = 90, 45 participants in each condition (no missing data).

*f* = overall frequency, *wf* = frequency for written disclosure group, *cf* = frequency for control group.

**Measures utilised**

A battery of questionnaires was administered to assess factors that may be related to improved physical and psychological health following written emotional disclosure. The same measures used in Study 1 included the Hospital Anxiety and Depression Scale (HADS), the World Assumptions Scale (WAS), the Cognitive Hardiness subscale of the Stress Assessment Inventory, the General Perceived Self-Efficacy Scale, and the Social Support Scale. As the psychometric properties of these measures have already been discussed at length in earlier chapters, only additional measures used in Study 2 will be discussed herein. Refer to Appendix F for a copy of ethical approval and the additional materials used in this study.

**Demographic information.** This measure was designed to record the age, gender, highest level of education currently attained (high school or lower, trade/TAFE, or university degree), employment status (not working, or currently employed part-time or full-time), and marital status (not in a relationship, or in a relationship by marriage or de-facto).

**Social Readjustment Rating Questionnaire (SRRQ).** The SRRQ is a 42-item scale that assesses the number of stressful life events that individuals have experienced in the past year (Holmes & Rahe, 1967). High reliability coefficients were observed for a control group (range from .96 to .89) and individuals diagnosed with a psychiatric condition (range from .91 to .70) over a 2 year period (Gerst, Grant, Yager & Sweetwood, 1978).

**Appraisal of Life Events Scale (ALES).** This scale measured primary appraisals of stressful life events in terms of threat, challenge, and loss (Ferguson, Matthews, & Cox, 1999). This scale has good test-retest reliability (range .90 to .48) and excellent internal reliabilities (range .91 to .75; Ferguson et al., 1999). Participants received an average score for each subscale (threat, challenge, and loss) of this measure, indicating the degree to which individuals viewed their stressful life experience as threatening, challenging, or as a loss. This was calculated by dividing the total score of each subscale by the number of questions in that subscale. In other words, because there were six questions within the Threat subscale, the total threat score was divided by six to determine the average score for threat. In contrast, the total loss score was divided by four to determine the average score for loss as only four questions assessed this factor.

**Posttraumatic Growth Inventory (PTGI).** The PTGI is a 21-item scale used to examine any benefits that emerge from coping with a stressful or traumatic life event. This may include improvements in social relationships, new possibilities for the future, greater personal strength, spiritual development, and a greater appreciation of life (Tedeschi & Calhoun, 1996). This scale has high internal consistency (.91) and acceptable test-retest reliability over a two month period (.71) (Tedeschi & Calhoun, 1996).

**Pennebaker Inventory of Limbic Languidness (PILL).** The PILL is a 54-item scale that assesses the frequency with which individuals experience a range of physical sensations and symptoms (Pennebaker, 1982). In this scale, participants indicate how often they tend to experience health complaints such as chest pains, swollen joints,

chills, face flushes, and nausea. Cronbach alpha's range from .88 to .91, and this scale has test-retest reliability ranging from .79 to .83 over a 2 month period (Pennebaker, 1982). High scores on the PILL are linked with more health care visits and reported sick days or absences from work, demonstrating the convergent validity of this physical health inventory (Pennebaker, 1982). A total score for this scale is calculated by summing the number of physical symptoms that participants reported experiencing at least once in the past month.

### **Measures developed for Study 2**

**Lifetime Trauma measure.** A Lifetime Trauma measure was developed using items from the LifeTime Trauma Scale (Turner and Lloyd, 1995) and Screening Scale for Traumatic Stress (Norris, 1990). As previous scales did not include some traumatic events that seemed important, three other questions were added to the model (“Have you ever been beaten up in a fight or has someone ever attacked you?”, “Have you ever witnessed or been victim of a robbery, mugging or hold up?” and “Have you had any other traumatic events like these?”). In addition, if participants identified experiencing an event, they were asked to indicate whether this event occurred within the last 12 months or more than 1 year ago. This measure has a total of 23 items, therefore scores on this scale ranged from 0 to 23. Participants were asked to indicate whether they had experienced a list of traumatic events such as parental divorce, sexual assault, repeating a year at school, and health problems throughout their life.

**Category of stressful or traumatic event.** In Study 1, participants were asked to describe the most stressful event that they had ever experienced. In this study,

participants were asked to describe “the most stressful or upsetting event” that they had ever experienced “even if you think that other people would not find it stressful or upsetting”. As before, the researcher and a colleague with extensive psychological counselling experience assigned each description to a stressful event category based on the coded events derived by other studies (Ferguson & Lawrence, 2000). If the reported event met criteria for different categories, decisions about category placement were based on the event which was expected to have more negative direct affect on the individual. Any discrepancies that emerged during the coding of variables were discussed until a consensus was met. There was high interrater reliability between coders who were trained professionals in the area of stress and trauma (the same raters used from Study 1), as Cohen’s kappa statistic for the stressful event categories was .83 ( $p = 0.0005$ ).

**Confidants’ reactions to disclosure.** Participants were asked to indicate perceived reactions of confidants (partner, family members, friends and professional health workers/ counsellors) following disclosure of their most stressful or upsetting life event (adapted from Bolton, Glenn, Orsillo, Roemer, & Litz, 2003). Participants were asked to place an “X” on a 10 centimetre line for each person they discussed this event with, indicating the degree to which their reaction was extremely negative (or unsupportive) and extremely positive (or very supportive). Below is a sample item from this scale:

Using the below scales, please place an “X” on the line to indicate how your family members, friends, partner, or professional health worker reacted when you discussed your stressful or upsetting event? If you have not discussed the event with the people listed, please circle N/A (which stands for “not applicable”).

Family members

Extremely negatively  
(eg. unsupportive)

Extremely positively  
(eg. very supportive)

N/A

---

An Overall Confidants’ Reactions to Disclosure score (ranging from 0 to 10) was calculated to identify the average reaction that participants experienced from all confidants, with higher scores being positive and lower scores being negative. This score was calculated by summing all reaction scores (family members, friends, partners, professionals) and dividing them by the number of people from the list that participants disclosed to:

$$\text{Overall Confidants' Reactions to Disclosure} = \frac{\text{Sum of all reaction scores}}{\text{Number of confidants (maximum score = 4)}}$$

## **Procedure**

Participants were informed that the first and last part of this study were to be conducted at a university office and a mid-point writing segment (journal writing phase) was to take place at the participant’s residence. The location of the disclosure sessions were chosen on the basis of Frattaroli’s (2006) recent finding that individuals tend to obtain greater benefits through home-based writing sessions when compared to laboratory-based sessions.

**Pre-test instructions.** After reading the information sheet and giving informed consent (refer to Appendix G), participants completed a battery of questionnaires in a quiet room at James Cook University. These questionnaires assessed demographic information, previous life events, perceptions of stressful or upsetting events, and disclosure reactions of confidants with regards to stressful events. Participants were asked to fill in the Holmes-Rahe Social Readjustment Scale to assess the number of stressful life events they had experienced over the past year (Holmes & Rahe, 1967). Participants were asked to indicate whether they had experienced certain stressful life events at some point in their life, and when the events occurred. This list was developed for the purpose of the current study by incorporating items used in previous traumatic stress research (Norris, 1990; Turner & Lloyd, 1995). Random assignment was utilised in this study as it was not possible to match groups due to the prolonged testing period (18 months), however, post-hoc data revealed that groups were fairly evenly assigned based on their previous exposure to stressful events. Participants were also asked to write down the “most stressful or upsetting event” they had ever experienced in their lifetime. A written copy of this event was placed in a sealed envelope and was returned to participants later at post-test. A standard measure was completed that assessed perceptions of life events (Appraisal of Life Events Scale (ALES): Fergusson, Matthews, & Cox, 1999). Participants were also asked to indicate perceived reactions of confidants (partner, family members, friends and professional health workers/ counsellors) following disclosure of this stressful or upsetting event.

Participants were asked to fill in questionnaires that focused on anxiety and depression (The Hospital Anxiety and Depression Scale (HADS): Zigmond & Snaith, 1983). Participants then filled in standard measures that assessed world assumptions



(World Assumptions Scale (WAS): Janoff-Bulman, 1989a), hardiness (The Cognitive Hardiness Sub-Scale of the Stress Assessment Inventory (SAI): Nowack, 1990), self-efficacy (The General Perceived Self-Efficacy Scale (GSE): Jerusalem & Schwarzer, 1992), social support (Social Support Scale(SSS): Marshall & Barnett, 1993), physical health (Pennebaker Inventory of Limbic Languidness (PILL): Pennebaker, 1982), and self deception (Self-Deception Questionnaire (SDQ): Sackeim & Gur, 1979).

**Writing segment.** The first writing session (which will be referred to as a “journal entry” herein) was conducted in the same room at James Cook University after filling in baseline questionnaires. Participants received guided instructions for this session dependent on what condition they were randomly assigned to. Based on Pennebaker’s writing paradigm, participants in the written disclosure condition were asked to write a journal entry for 15 minutes or more that focussed on a stressful or upsetting event they experienced in their lifetime. Researchers have suggested that individuals are more likely to benefit from the written disclosure process if they receive direct questions or examples in the writing instructions (Broderick et al., 2004; Frattaroli, 2006), therefore the current study aimed to encourage this. Below are the first journal entry instructions for the written disclosure condition:

#### Written disclosure: 1<sup>st</sup> Journal Entry

Earlier, you were asked to write a sentence or two on the most stressful or upsetting event that you have experienced in your lifetime.

Please write about your deepest thoughts and feelings surrounding this experience in as much detail as you can. Aim to write a whole page. Really get into it and freely express any and all emotions or thoughts that you have about the experience. You may like to describe the thoughts and feelings you

experienced at the time of the event. All your writing will be completely confidential. As you write, do not worry about punctuation or grammar; just really let go and write as much as you can. The important thing is that you write about your deepest thoughts and feelings surrounding this event in as much detail as you can.

Participants in the control condition wrote about day-to-day topics unrelated to stress. Below are the first journal entry instructions for the control condition:

Control condition: 1<sup>st</sup> Journal Entry

I would like you to write a step-by-step guide on how to prepare for a party.

Could you please explain the steps involved in preparing for a party as objectively as you can, without mentioning your feelings, thoughts or opinions about parties. Please write as much detail as you can. Aim to write a whole page. You may like to focus on the following things: What should you do first if you are organising the party? What should you buy? Do you have to hire out extra chairs or buy ice? What drinks and food will be provided? Who will be invited? What will you wear? How long will the party go for? Who is going to clean up afterwards? As you write, do not worry about punctuation or grammar; just try to write as much as you can. The important thing is to write about the steps you would take if you were having a party.

After completing this writing segment, participants were asked to place their journal entry into a sealed envelope, write the date on the envelope, and return it to the researcher. The researcher explained to participants that the journal entries would not be read by anyone to ensure confidentiality, but would be retained in a secure room at James Cook University. It was anticipated that a degree of privacy would ensure greater involvement with the writing sessions. Further to this, researchers have suggested that individuals feel more relaxed when disclosing stressors in private which may reduce the chance for biased results (Frattaroli, 2006; Klein & Boals, 2001). The researcher kept the envelope with the questionnaires obtained from the participant at pre-test.

Participants were asked to write journal entries two more times before completing the second part of this experiment. Participants were informed that such writing sessions should last for at least 15 minutes each, according to the recommendations of Pennebaker (1997). The approximate dates for participants to complete the remaining two journal entries were written on the outside of separate envelopes, which contained guided instructions for each of these writing sessions. Participants were encouraged to complete the remaining journal entries one week apart. Participants were asked to bring these sealed envelopes at the second part of the experiment. Below are the instructions for the second journal entry for the written disclosure and control condition, followed by the third journal entry instructions for both conditions:

Written disclosure: 2<sup>nd</sup> Journal Entry

Again, I would like you to write about the most stressful or upsetting event that you have experienced in your lifetime.

If the situation you are describing is difficult to deal with, describe how you are trying to deal with it and how you are trying to understand it. Also describe what you would do in the future should you encounter a similar event again. All your writing will be completely confidential. As you write, do not worry about punctuation or grammar; just really let go and write as much as you can. The important thing is that you write about how you deal (or dealt) with the most stressful event you have ever experienced and how you would respond to similar events in the future

Control condition: 2<sup>nd</sup> Journal Entry

This journal entry should focus on as many factual details you can think of about your Primary school, High school or University.

Could you please try to describe your Primary school, High school or University as objectively as you can, without mentioning your feelings, thoughts, or opinions about this place. What was the name of your school? How many

people went there? What did the buildings look like? How did you get to there each day (bike, car, walking)? What subjects did you do? How long did lunch breaks go for? How long did classes go for? And so forth. As you write, do not worry about punctuation or grammar; just try to write as much as you can. The important thing is to write about factual details of your Primary school, High school or University.

Written disclosure: 3<sup>rd</sup> Journal Entry

I would like you to write about the most stressful or upsetting event that you have experienced in your lifetime.

This time, I would like you to write about the positive aspects of this experience. Again, aim to write for a whole page. Please write about how you have changed or grown as a person as a result of this experience. Describe how the experience has benefited you as a person- Have you learnt something from it? Do you feel better equipped to handle other challenges in the future? All your writing will be completely confidential. As you write, do not worry about punctuation or grammar; just really let go and write as much as you can. The important thing is that you write about the positive aspects of your stressful event.

Control condition: 3<sup>rd</sup> Journal Entry

I would like you to write instructions on how to carry out household cleaning duties.

Could you please try to explain how you do household cleaning duties as objectively as you can, without mentioning your feelings, thoughts, or opinions about cleaning. Please write as much detail as you can. Aim to write a whole page. You may like to focus on the following things: What should you do first? What utensils are necessary to carry out this process? How long does it take to clean a house? As you write, do not worry about punctuation or grammar; just try to write as much as you can. Just make sure you write a step-by-step guide on how people should carry out cleaning duties in houses.

Most participants indicated that the pre-test and the journal entries took approximately 2 hours to complete. Participants were informed that they would need to return for the second part of the study in four weeks. A four week interval (28 days) was the time frame that the researcher tried to maintain, however it was envisaged that it would not always be possible for participants to meet exactly 28 days later. Therefore,

the days that passed between pre-test and post-test (days between sessions) were recorded for each participant.

**Post-test instructions.** Approximately four weeks after commencing this study, participants were given some of the questionnaires that were completed at pre-test. Participants filled in questionnaires that assessed anxiety, depression, world assumptions, physical health, hardiness, and self-efficacy. The Social Support Scale and the Self-Deception Questionnaire were not administered at post-test because researchers have suggested that self-deception and perceived social support are relatively stable characteristics that remain unchanged despite exposure to new experiences (Kendler, 1997; Lee & Klein, 2002; Sarason, Sarason, & Shearin, 1986).

Participants were given the sealed envelope collected at pre-test that detailed their most stressful or upsetting life event. After reading this event, participants were asked to fill in some questions which related to this life experience. Participants were assessed on the degree to which they perceived positive benefits from their stressful life experiences (the Posttraumatic Growth Inventory (PTGI): Tedeschi & Calhoun, 1996). Participants also reported their appraisals of this event after engaging in this study (Appraisal of Life Events Scale (ALES): Fergusson, Matthews, & Cox, 1999). In order to gauge the rate of compliance to instructions, participants were asked to indicate how many journal entries they kept, as it was expected that some participants would not complete all writing sessions. Completion of the post-test took approximately 40 minutes. After handing in their questionnaires, participants were verbally debriefed and were given a debriefing sheet (refer to Appendix H).

**Power analysis and considerations regarding sample size**

To calculate effect size, Cohen (1992) provided the following guidelines:  $d = 0.20$  is a small effect size,  $d = 0.50$  is a medium effect size, and  $d = 0.80$  is a large effect size. Smyth (1998) discovered that the average weighted effect size of written emotional disclosure was  $d = 0.47$  across thirteen studies, which is basically equivalent to a medium effect size ( $f^2 = .15$ ). Based on the sample size calculation for multiple regression using G\*Power (Faul & Erdfelder, 1992), a total of 85 participants were needed in this study to reach a medium effect size ( $f^2 = .15$ ) using four predictors, with 80 % power at a .05 significance level.

## CHAPTER 7

### Study 2: Results and Discussion

#### Data screening

Kurtosis and skewness were examined for all continuous variables. Results demonstrated that the majority of variables did not exceed acceptable kurtosis (-3 to +3) and skewness levels (-2 to +2), which suggested that the distributions could be considered normal. The Kolmogorov-Smirnov test found that various measures were not normally distributed (refer to Appendix I). All results were assessed using two tailed tests.

Before conducting MANOVAs, the assumptions of equal cell size, univariate normality, multivariate normality, equality of variance-covariance matrices, linearity, multicollinearity, singularity, and homogeneity of variance were examined. Assumptions of normality, homogeneity of variance, random selection, and sphericity were examined for ANOVAs. Likewise, the assumptions of an adequate sample size, multicollinearity, normality, linearity, homoscedasticity, and outliers were examined for each regression analysis. Violations of assumptions are reported in the relevant sections.

#### Preliminary tests

Although predictions were not made about gender, marital status, education level or employment status, tests were conducted to determine whether these variables were related to any of the main variables in subsequent analyses. Table 11 shows that women had significantly higher scores for threat appraisals, loss appraisals, and anxiety scores, whereas men had higher self-efficacy scores (refer to Table 1 of Appendix J for non-significant results).

Table 11. *Significant gender differences across outcome measures at pre- and post-test*

	Women Mean ( $\pm$ SD)	Men Mean ( $\pm$ SD)	<i>t</i>	<i>p</i>
<i>Pre-test</i>				
Threat appraisals	20.02 $\pm$ 7.19	15.79 $\pm$ 8.00	-2.51	.014*
Loss appraisals	12.95 $\pm$ 4.09	10.21 $\pm$ 5.77	41.87	.027*
HADS Anxiety	7.36 $\pm$ 3.50	6.00 $\pm$ 2.74	68.92	.049*
Self-efficacy	30.74 $\pm$ 3.86	32.38 $\pm$ 3.43	1.95	.055†
<i>Post-test</i>				
Posttraumatic growth	56.91 $\pm$ 20.62	46.86 $\pm$ 21.79	-2.12	.037*

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; † trend toward significance, N = 90

As seen in Table 12, independent *t* tests demonstrated that participants scored differently on the main variables as a result of their marital status (refer to Table 2 of Appendix J for non-significant results).

Table 12. *Significant differences across outcome measures at pre- and post-test in terms of marital status*

	Married/De-facto Mean ( $\pm$ SD)	Not in relationships Mean ( $\pm$ SD)	<i>t</i>	<i>p</i>
<i>Pre-test</i>				
Challenge appraisals	5.26 $\pm$ 4.86	7.61 $\pm$ 5.97	2.04	.045*
PILL physical symptoms	11.63 $\pm$ 6.94	15.83 $\pm$ 8.35	2.60	.011*
Self-deception	104.53 $\pm$ 13.62	97.83 $\pm$ 13.93	-2.29	.025*
<i>Post-test</i>				
Threat appraisals	9.43 $\pm$ 8.18	12.85 $\pm$ 6.97	2.10	.039*
HADS Anxiety	6.29 $\pm$ 2.73	7.63 $\pm$ 3.57	2.03	.045*
PILL physical symptoms	10.84 $\pm$ 6.34	16.00 $\pm$ 10.38	2.90	.005**

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; † trend towards significance, N = 90



With regards to employment status, independent *t* tests showed that there were no significant differences on measures at pre-test or post-test (refer to Table 3 of Appendix J). When examining education level of participants, one-way between group ANOVAs showed that there were no significant differences on measures at pre-test or post-test (refer to Table 4 of Appendix J).

### **The relationships among variables at the start of the study**

To replicate Study 1, bivariate correlations were conducted to determine if participants with higher resilience at the start of the study (hardiness, social support, self-efficacy, and self-deception) reported significantly lower psychological symptoms (HADS Anxiety, HADS Depression), fewer physical health problems (PILL scores), more positive appraisals, greater posttraumatic growth, and more positive assumptions about the self and world (Total WAS score) at intake. As expected, results showed that participants reported fewer anxiety symptoms at pre-test if they had higher levels of hardiness, self-efficacy, and self-deception at the start of the experiment. In a similar pattern, participants had fewer depressive symptoms if they reported heightened levels of hardiness, self-efficacy, and social support at pre-test. Basic beliefs about the world and self (Total WAS scores) were significantly higher among participants with high levels of resilience as measured by the four resilience scales. With regards to appraisals, the only significant difference was that participants reported higher challenge appraisals at pre-test if they had low levels of social support at the start of the experiment. Results also showed that participants tended to report more physical health problems if they had lower self-deception at the start of the study. Participants who experienced more stress in the past year tended to report experiencing more traumas throughout their lifetime,

had higher threat appraisals, more depression, more physical symptoms, and lower self-deception. Those who experienced more traumas in their lifetime tended to report more growth from such events, higher threat appraisals, lower self-deception, and generally more negative beliefs about themselves and the world (Table 13).

Correlations were also conducted to determine if demographic and methodological factors were related to the main variables at pre-test, and therefore needed to be considered in subsequent analyses. Table 13 shows that older participants experienced significantly fewer life stressors (SSRQ scores) in the past year, had fewer physical health problems (PILL scores), reported less supportive social networks, and were higher self-deceivers. Not everyone completed all three journal entries and therefore it was necessary to explore whether this was related to responses. The only significant relationship was that participants with lower self-efficacy at the start of the study tended to complete a greater number of the required journal entries. In addition, participants ideally completed the second part of this study four weeks after commencing, however, this was not always possible due to difficulties arranging times to meet with participants. It was found that participants who experienced greater delays between phases of the study tended to report higher beliefs about the world and self, fewer loss appraisals, and reported lower levels of social support (refer to Table 13).

Table 13. Zero-order correlations among variables at the start of the study

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Age	1.00																		
2. Education	.06	1.00																	
3. No. of journal entries completed	.09	-	1.00																
4. Days between surveys	-.03	.06	-.009	1.00															
5. Confidants' reaction to disclosure	-.16	-.04	-.04	.03	1.00														
6. SSRQ stress scores	-.35**	-.06	-.21	-.08	-.03	1.00													
7. Number of life traumas	-.03	-.09	-.04	-.15	-.02	.33**	1.00												
<i>Main variables</i>																			
8. Threat appraisals	-.06	-.17	-.05	-.06	.02	.24*	.33**	1.00											
9. Loss appraisals	-.05	.18	-.13	-.24*	.08	.19	.17	.17	1.00										
10. Challenge appraisals	-.08	-.15	.08	.17	.06	.02	.04	.08	-.05	1.00									
11. Posttraumatic growth	.10	-.07	.12	-.13	.11	-.03	.23*	.27*	.33**	.08	1.00								
12. HADS Anxiety	-.10	-.04	.16	-.17	.14	.10	.19†	.29*	-.02	-.08	.27*	1.00							
13. HADS Depression	-.06	.03	.05	-.13	-.09	.25*	.15	.20	.03	-.04	.06	.48***	1.00						
14. PILL Physical health problems	-.40***	-.07	-.10	-.03	.002	.26*	.17	.13	-.05	.10	.02	.22*	.18	1.00					
15. WAS total scores	.13	.08	.005	.23*	.14	-.06	-.28*	-.16	-.12	.09	-.12	-.23*	-.37***	-.18	1.00				
16. Hardiness	-.04	.03	-.16	.12	.15	.02	-.06	-.17	.06	.10	-.19	-.59***	-.63***	-.18	.54***	1.00			
17. Self-efficacy	-.04	.08	-.26*	.10	.12	.10	.02	-.12	-.07	.20†	-.16	-.42***	-.42***	-.04	.30**	.51***	1.00		
18. Social support	-.21*	.16	-.05	-.26*	.34**	-.07	-.12	-.13	-.16	-.24*	-.03	.03	-.31**	.13	.35**	.28*	.12	1.00	
19. Self-deception	.49***	.03	.06	.05	.01	-.31**	-.40***	-.13	.02	.09	-.03	-.43***	-.17	-.28*	.33**	.20†	.08	.10	1.00

\* Correlation is significant at or below the 0.05 level (2-tailed), \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ ). N = 65

### **The impact of written disclosure on physical and psychological health**

To examine if groups were equivalent at the start of the study, a one-way between-groups MANOVA was conducted to determine if the control condition and written disclosure condition differed in terms of appraisals, HADS Anxiety, HADS Depression, PILL physical health, world assumptions, posttraumatic growth, hardiness, or self-efficacy. Overall, there was not a significant difference between groups on the psychological and physical health measures,  $F(28, 54) = .71, p = .83$ . To test the prediction that individuals who wrote about stressful events would report greater psychological and physical health over the course of the experiment when compared to individuals who wrote about non-stressful activities (Hypothesis 2), a doubly multivariate mixed ANOVA was conducted. Before conducting the analysis, the data were assessed for violations of assumptions. No serious violations were noted for normality, linearity, outliers, homogeneity of variance-covariance matrices, and multicollinearity. Results revealed an overall significant Condition x Time interaction,  $F(10, 78) = 3.31, p = .001, \text{partial } \eta^2 = .30$ , indicating that psychological and physical health improved for those who wrote about their most stressful life experience. Table 14 shows that positive changes in anxiety, physical symptoms, posttraumatic growth, basic beliefs (WAS scores), and hardiness contributed to this multivariate interaction. Additional ANCOVAs were conducted, as some demographic and methodological factors were correlated with the main variables, however, results of such analyses revealed that these covariates generally did not alter the main findings, hence they are not reported.

Table 14. *Univariate tests for the Condition x Time interaction*

	Written disclosure Mean $\pm$ SD	Control condition Mean $\pm$ SD	<i>F</i> (1, 87)	Partial $\eta^2$	<i>p</i>
<b>Threat appraisals</b>					
Pre-test	18.27 $\pm$ 6.97	18.86 $\pm$ 8.40	.480	.005	.49
Post-test	10.04 $\pm$ 7.38	11.91 $\pm$ 8.19			
<b>Challenge appraisals</b>					
Pre-test	6.49 $\pm$ 5.59	6.23 $\pm$ 5.50	.061	.001	.81
Post-test	6.64 $\pm$ 5.88	6.11 $\pm$ 5.00			
<b>Loss appraisals</b>					
Pre-test	11.71 $\pm$ 5.03	12.48 $\pm$ 4.71	2.35	.026	.13
Post-test	7.69 $\pm$ 5.01	10.23 $\pm$ 5.61			
<b>HADS Anxiety</b>					
Pre-test	7.33 $\pm$ 2.88	6.52 $\pm$ 3.73	4.74	.05	.032*
Post-test	6.69 $\pm$ 2.21	7.09 $\pm$ 3.99			
<b>Depression</b>					
Pre-test	4.04 $\pm$ 2.90	3.61 $\pm$ 3.76	.42	.005	.52
Post-test	4.04 $\pm$ 3.21	3.91 $\pm$ 3.88			
<b>PILL physical symptoms</b>					
Pre-test	14.82 $\pm$ 8.12	12.27 $\pm$ 7.54	33.60	.28	.005**
Post-test	11.29 $\pm$ 7.96	15.27 $\pm$ 9.22			
<b>Posttraumatic growth</b>					
Pre-test	45.49 $\pm$ 21.97	46.00 $\pm$ 24.81	5.25	.06	.024*
Post-test	58.22 $\pm$ 16.35	48.66 $\pm$ 24.95			
<b>Total WAS scores</b>					
Pre-test	122.40 $\pm$ 12.69	127.00 $\pm$ 16.05	3.95	.04	.050*
Post-test	126.98 $\pm$ 13.16	125.98 $\pm$ 13.99			
<b>Hardiness</b>					
Pre-test	101.96 $\pm$ 11.27	107.48 $\pm$ 14.87	5.02	.06	.028*
Post-test	103.64 $\pm$ 11.12	104.11 $\pm$ 14.25			
<b>Self-efficacy</b>					
Pre-test	30.42 $\pm$ 3.48	32.14 $\pm$ 3.97	3.87	.04	.052†
Post-test	31.18 $\pm$ 3.25	31.73 $\pm$ 4.01			

\*  $p < .05$ , \*\*  $p < .005$ , † trend towards significance,  $N = 90$

Simple effects analyses were conducted to pinpoint significant differences between groups over the two time periods. As seen in Figure 3, participants who wrote about stressful experiences reported significantly fewer physical complaints at the end of the experiment relative to baseline scores,  $F(1, 87) = 19.88, p < .05$ . In contrast, participants reported significantly more physical problems over the course of the experiment if they wrote about non-stressful daily activities,  $F(1, 87) = 12.68, p < .05$ . Overall, participants reported significantly fewer physical health problems at the end of the study if they wrote about stressful experiences rather than if they wrote about commonplace activities,  $F(1, 356) = 4.79, p < .05$ . There was not a significant difference between groups at pre-test,  $F(1, 356) = 2.17, p > .05$ .

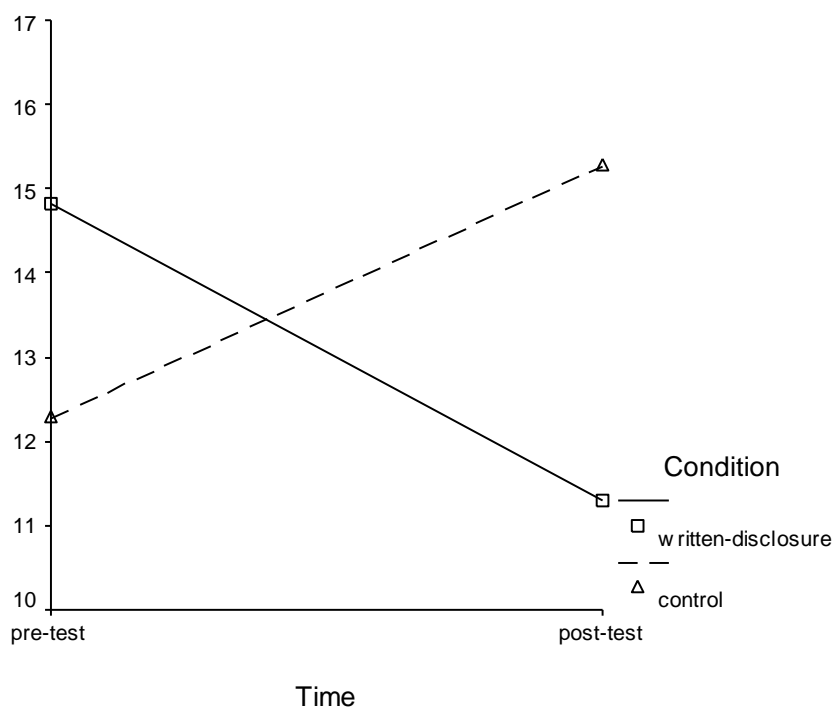


Figure 3.

*Frequency of PILL physical symptoms for written disclosure and control participants at pre-test and post-test*

In examining simple effects, participants reported significantly greater personal growth over the course of the experiment if they wrote about their most stressful life event,  $F(1, 87) = 16.95, p < .05$ . However, participants did not experience changes in posttraumatic growth from pre-test to post-test if they wrote about non-stressful events,  $F(1, 87) = .66, p > .05$ . Figure 4 shows that the two groups did not differ significantly in posttraumatic growth at intake ( $F(1, 356) = .05, p > .05$ ) or at the end of the experiment ( $F(1, 356) = 3.75, p > .05$ ).

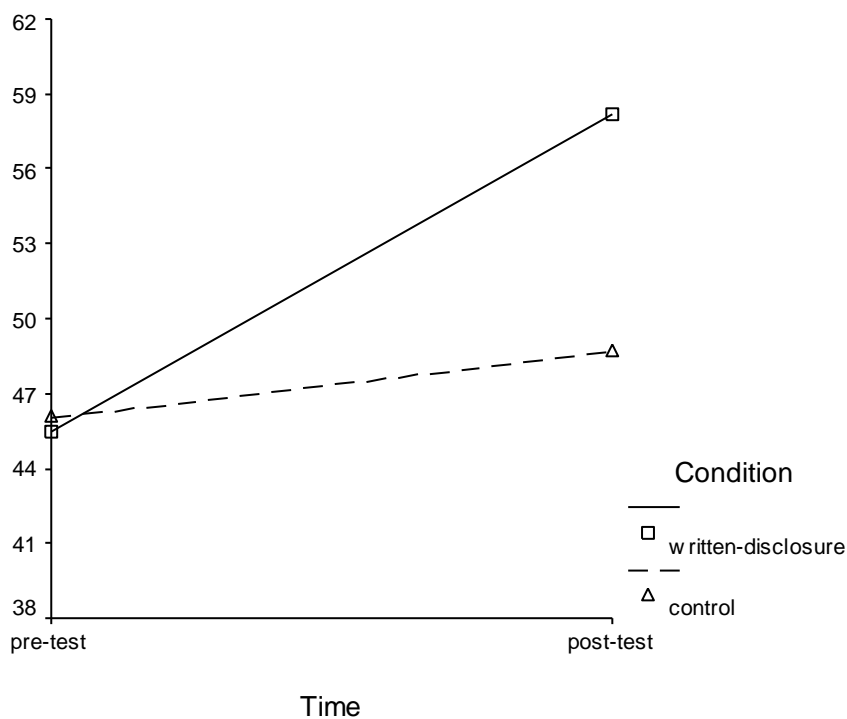


Figure 4.

*Degree of posttraumatic growth for written disclosure and control participants at pre-test and post-test*

Simple effects showed that the written disclosure and control group did not significantly differ in world assumptions at the start ( $F(1, 356) = 2.39, p > .05$ ) or the

end of the experiment ( $F(1, 356) = .06, p > .05$ ). However, participants who wrote about stressful events reported significantly more positive beliefs about themselves, others, and the world at the end of the experiment when compared to their beliefs at pre-test,  $F(1, 87) = 5.12, p < .05$ . Those who wrote about non-stressful activities tended to remain fairly stable in their worldviews and personal beliefs,  $F(1, 87) = .42, p > .05$ . Refer to Figure 5.

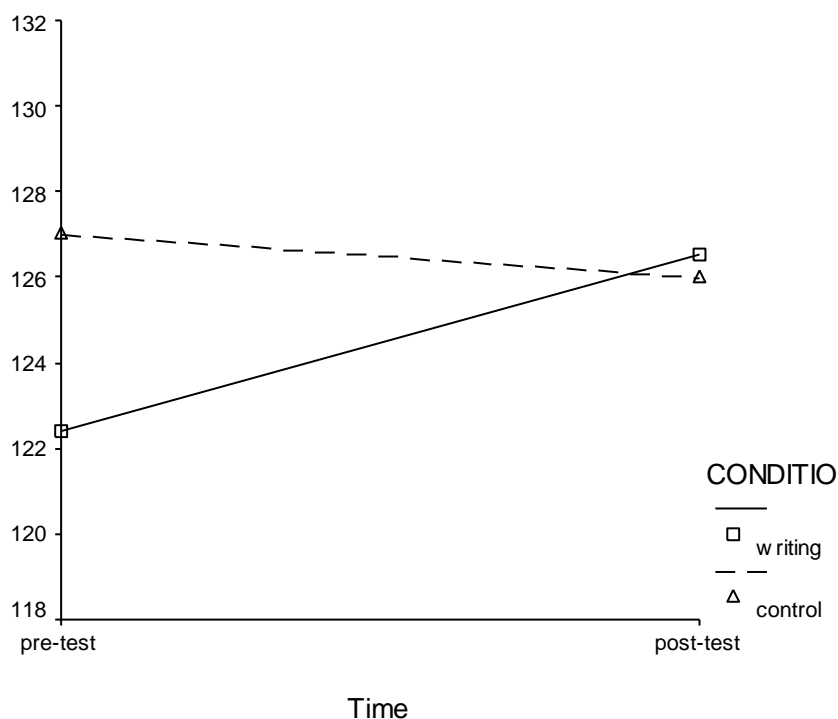


Figure 5.

*Total World Assumption Scale (WAS) scores for written disclosure and control participants at pre-test and post-test*

Simple effects showed that participants randomly assigned to the written disclosure group had significantly lower levels of hardiness at the start of the study compared to those in the control group,  $F(1, 356) = 4.49, p < .05$ . However, the groups



were not significantly different in hardiness at the end of the study,  $F(1, 356) = .11, p > .05$ . Participants who wrote about non-stressful activities had significantly lower levels of hardiness at the end of the experiment relative to baseline scores,  $F(1, 87) = 4.07, p < .05$ , whereas participants who wrote about stressors had a slight increase in hardiness from pre-test to post-test, but this change was not significant,  $F(1, 87) = 1.13, p > .05$ .

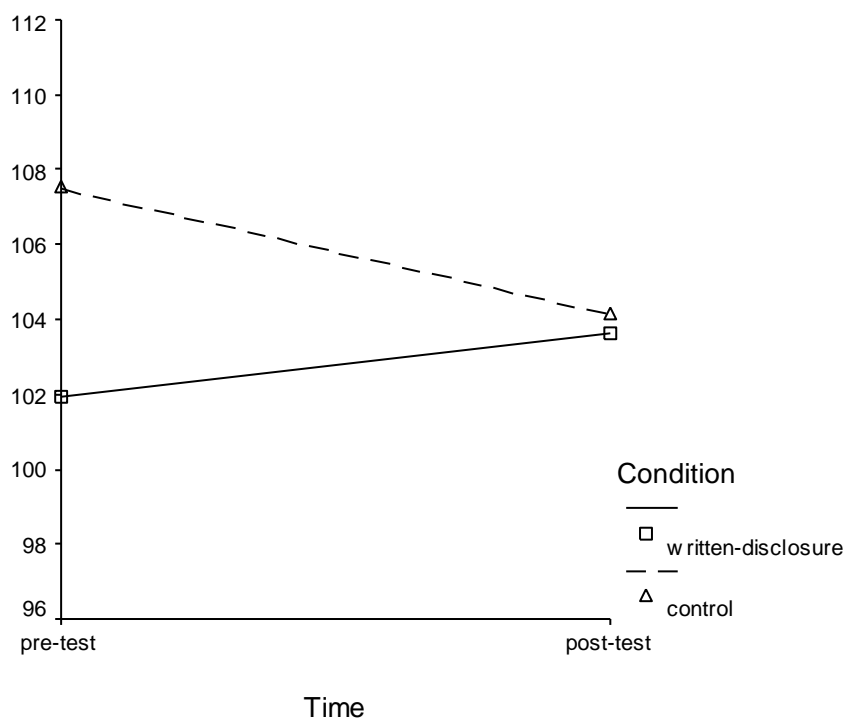


Figure 6.

*Hardiness scores for written disclosure and control participants at pre-test and post-test*

Participants randomly assigned to the written disclosure condition reported significantly lower levels of self-efficacy at pre-test when compared to those in the control condition,  $F(1, 356) = 4.71, p < .05$ . No other significant simple effects were found for self-efficacy, however, results were in the predicted direction as there was a slight increase in self-efficacy from pre- to post-test for those who wrote about stressful

experiences and a slight decrease in self-efficacy over time for those who wrote about trivial topics.

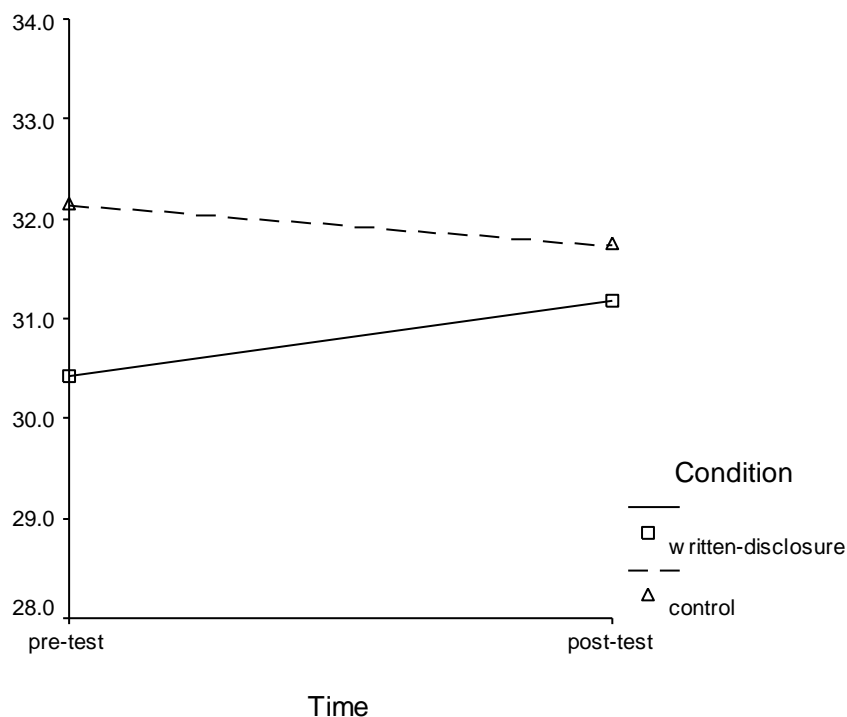


Figure 7.

*Self-efficacy scores for written disclosure and control participants at pre-test and post-test*

Simple effects analyses showed that the groups did not significantly differ in anxiety at the start ( $F(1, 356) = 1.41, p > .05$ ) or the end of the study ( $F(1, 256) = .37, p > .05$ ). Nevertheless, Figure 8 shows that changes were in the predicted direction with participants who wrote about stressful experiences reporting fewer anxiety symptoms at post-test relative to at the start of the experiment,  $F(1, 87) = 2.71, p > .05$ . Participants who wrote about non-stressful experiences were also found to experience a slight increase in anxiety over the course of the experiment,  $F(1, 86) = 2.34, p > .05$ .

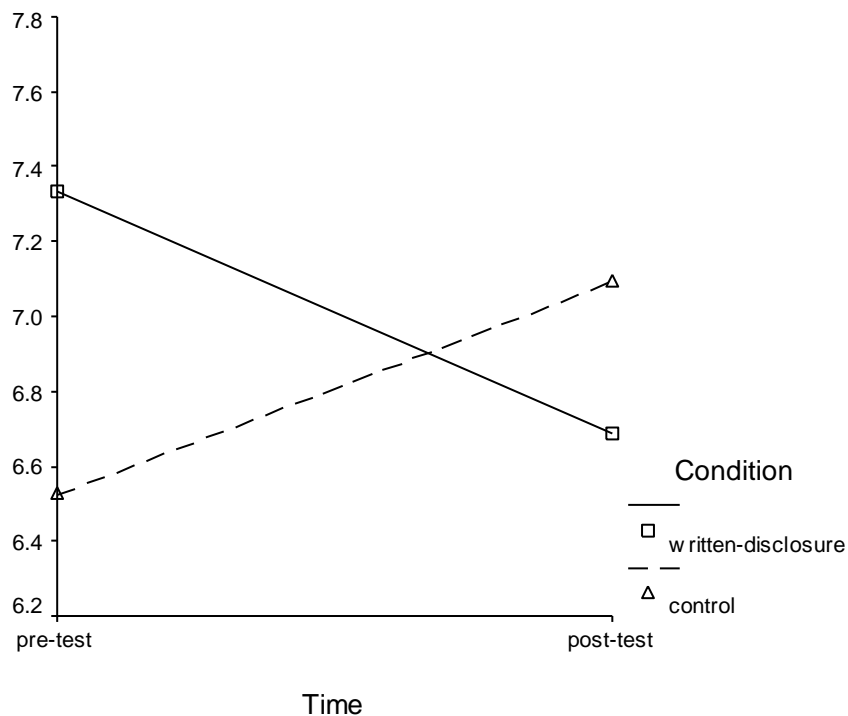


Figure 8.

*Frequency of HADS Anxiety for written disclosure and control participants at pre-test and post-test*

### **Improved resilience in terms of improved psychological and physical symptoms following written disclosure**

Data from participants randomly assigned to the written disclosure condition were further examined to test the hypothesis that improved hardiness and self-efficacy were significantly related to improved psychological and physical health (difference scores for HADS Anxiety, HADS Depression, PILL physical symptoms, Threat appraisals, Loss appraisals, Challenge appraisals, Posttraumatic growth, and Total WAS scores). Difference scores were calculated by subtracting the pre-test score (collected at the start of the study) from the post-test score (collected at the end of the study) for each

measure. Positive changes in resilience, physical health, and psychological health over the course of the experiment were represented by positive difference scores. As shown in Table 15, participants who developed higher hardiness and self-efficacy over the course of the study reported significantly greater posttraumatic growth, more positive personal beliefs and worldviews (Total WAS scores), and lower anxiety, depression, and physical symptoms after writing about stressful life experiences. Changes in resilience from the start to the end of the experiment were not significantly related to changes in appraisals following written-emotional disclosure.

It was necessary to determine if demographic and methodological factors were related to changes in physical and psychological health for participants assigned to the written disclosure condition, and therefore had to be considered in subsequent analyses. Table 15 shows that participants randomly assigned to the written disclosure condition reported fewer anxiety symptoms at the end of the experiment relative to initial scores if they completed a greater number of journal entries (with a maximum of three). Age, education level, stress exposure in the past year, number of lifetime traumas, and previous reactions from confidants following stress-related disclosure were not significantly related to changes in any of the main outcome measures over the course of the experiment.

Independent *t* tests were conducted on the remaining demographic variables and outcome measures. Only one significant gender difference was found, with women ( $M = -10.41, \pm 8.14$ ) reporting significantly lower threat appraisals from the start to the end of the study when compared to men ( $M = -4.25, \pm 6.97$ ),  $t(43) = 2.55, p < .014$ . With regards to marital status, participants in a relationship ( $M = -10.10, \pm 8.56$ ) reported significantly lower threat appraisals from pre- to post-test when compared to those who

were not in relationships ( $M = -4.47, \pm 6.17$ ),  $t(43) = 2.27, p < .029$ . When examining education and employment status, independent  $t$  tests showed that there were no significant differences on outcome measures. Refer to Table 1 to 4 in Appendix K for non-significant results of the independent  $t$  tests.

**Improved resilience from pre-test to post-test: Links to improvement in psychological symptoms, physical symptoms, and overall health following written disclosure**

Standard multiple regression analyses were conducted to determine which variable was the best predictor of improved psychological and physical health: changes in hardiness or changes in self-efficacy following written emotional disclosure (Hypothesis 3 continued). Improvement was determined by a positive difference score on measures (HADS Anxiety, HADS Depression, PILL physical symptoms, WAS scores, posttraumatic growth, Threat appraisals, Challenge appraisals, and Loss appraisals) for participants in the written-disclosure group, taking into account correlated demographic and methodological variables.

Before running the regression analyses, the assumptions of linearity, homoscedasticity, and independence of residuals were tested and found to be acceptable. However, the critical Mahalanobis distance value for two independent variables at alpha .001 ( $X^2$  critical = 13.82) was violated by one particular case for all dependent measures (changes in HADS Anxiety, HADS Depression, PILL physical symptoms, Posttraumatic growth, Threat appraisals, Challenge appraisals, and Loss appraisals). Because the case that scored higher than the critical value exceeded the maximum value for Cook's Distance (Tabacknick & Fidell, 2001, pg. 69), this case was removed from subsequent

Table 15. Zero-order correlations reflecting changes in resilience, psychological health, and physical health from pre-test to post-test among the written-disclosure group

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Age	1.00																
2. Education	.06	1.00															
3. No. of journal entries completed	.09	-.002	1.00														
4. Days between surveys	-.03	.06	-.009	1.00													
5. Confidants' reaction to disclosure	-.16	-.04	-.04	.03	1.00												
6. SSRQ stress scores	-.35**	-.06	-.21	-.08	-.03	1.00											
7. Number of life traumas	-.04	-.09	-.04	-.15	-.02	.33**	1.00										
<i>Difference scores</i>																	
8. Threat appraisals	-.06	.08	.06	-.04	.12	.05	-.14	1.00									
9. Loss appraisals	-.09	-.09	.15	-.04	.09	.03	-.13	.52***	1.00								
10. Challenge appraisals	-.05	.10	-.15	-.02	.11	.18	-.15	.23*	.30**	1.00							
11. Posttraumatic growth	-.02	.04	-.07	-.05	-.03	.21	-.16	.15	.07	.26*	1.00						
12. HADS Anxiety	-.05	-.15	-.26*	.13	.04	.11	.04	.22*	.14	.06	-.21*	1.00					
13. HADS Depression	-.07	-.17	-.10	.07	.13	.12	-.05	.04	.22*	.04	-.03	.29*	1.00				
14. PILL Physical health problems	.07	-.12	-.10	-.13	.06	-.18	-.12	.17	.20†	-.02	-.27*	.38***	.03	1.00			
15. WAS total scores	-.06	.006	.06	-.20	.05	-.08	.02	-.15	-.29*	.11	.24*	-.38***	-.42***	-.32**	1.00		
16. Hardiness	.10	.10	-.03	-.06	-.10	-.04	-.01	-.08	-.14	.05	.28*	-.44***	-.42***	-.31**	.53***	1.00	
17. Self-efficacy	-.08	.06	.19	-.11	-.02	.08	-.001	-.03	-.01	-.03	.25*	-.50***	-.25*	-.38***	.56***	.43***	1.00

\* Correlation is significant at or below the 0.05 level (2-tailed), \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ ). N = 45

Difference scores = changes in scores from pre-test to post-test

regression analyses. No tolerance value was below .2, and therefore were not a concern for multicollinearity (according to Pallant, 2005).

After removing the offending case, standard multiple regression was conducted to determine whether changes in hardiness or changes in self-efficacy best predicted changes in dependent measures. The only significant result was found when examining World Assumption Scale (WAS) subscale scores, thus only this result will be reported. The standard regression analysis revealed that combined changes in self-efficacy and hardiness explained 21.5% of the variance in improved WAS subscale scores following written emotional disclosure, Multiple R = .50,  $F(2,41) = 6.88$ ,  $p = .003$ . Further examination revealed that it was improved self-efficacy ( $p = .005$ ) that made the significant unique contribution to the prediction of improved WAS scores (refer to Table 16). Therefore, individuals who developed higher self-efficacy after writing about their stressful life experiences tended to report more positive beliefs about themselves and the world at the end of the study compared to their initial scores.

Table 16. *Improved self-efficacy from pre-test to post-test predicting improved world assumptions following written disclosure*

	B	SE B	$\beta$
Hardiness	.27	.19	.20
Self-efficacy	1.73	.59	.41**

Note  $R^2 = .25$  ( $ps < .005$ ). \*  $p < 0.05$ , \*\*  $p < 0.05$ , \*\*\*  $p < .0005$ .

## Discussion

### **Initial resilience scores and baseline psychological and physical health**

In support of Hypothesis 1, participants with higher levels of hardiness, self-efficacy, social support, and self-deception tended to report fewer anxiety symptoms and depressive symptoms at the start of the experiment. These findings replicate the results of the first study that demonstrated individuals high in resilience had more positive mental health. The current analysis also showed that participants reported more physical symptoms at the start of the study if they were low self-deceivers. Taken together, these results support the finding that self-efficacy is negatively associated with depression (Regehr, Hill, Knott, & Sault, 2003), and that hardiness moderates the negative effects of stress in terms of depression (Nowack, 1989), illness levels (Kobasa, 1979), and anxiety (Beasley, Thompson, & Davidson, 2003). Social support and self-deception have the potential to offset the negative impact of stressful life events. Individuals with low levels of social support tend to be more prone to psychological difficulties following stressful events (DeLongis, Folkman, & Lazarus, 1988), whereas those with adequate social support tend to be better able to demonstrate resilience in times of stress (Cohen & Syme, 1985). According to Flett and colleagues (1979), self-deception is negatively related to a range of emotions including anxiety, anger, contempt, guilt, hopelessness, remorse, and shame. Thus, it seems reasonable to suggest that self-efficacy, social support, self-deception, and hardiness protect well-being and stimulate effective functioning in response to stressful life circumstances.

The current study also demonstrated that participants tended to maintain more positive views of themselves, others, and the world if they had higher resilience, in line with the results of Study 1. Researchers have suggested that assumptions about the self,



others, and world are influenced by the way that individuals cope with stress (Goldenberg & Matheson, 2005; Janoff-Bulman & Frantz, 1997) and the type of reactions individuals received from others following stressful experiences (Hyman, Gold, & Cott, 2003). It has been argued that social support following extreme stress has the potential to prevent the development of negative core beliefs, such as low levels of self-worth or negative views of others. For example, Goldenberg and Matheson (2005) found that individuals were more likely to view others as kind and benevolent if they received positive social support when dealing with stressful situations. Hyman et al. (2003) suggested that female sexual abuse victims ( $N = 172$ ) were better able to cope with difficult circumstances such as rape when they felt valued by members of their support network. According to Janoff-Bulman (1992), engaging in trauma-related discussions provide opportunities for individuals to work through changes in world assumptions that commonly occur following overwhelming stressful events and traumas. This indirectly suggests that individuals are more likely to maintain positive worldviews and assumptions if they have supportive social networks. Farber and colleagues (2000) also suggested that hardiness can predict the type of worldviews held by individuals diagnosed with HIV and AIDS. They found that high levels of hardiness were positively associated with higher World Assumption Scale (WAS) scores: namely, benevolence ratings of the world, benevolence ratings of people, randomness of outcomes, controllability, and high self-worth ratings (Farber et al., 2000). Thus, there is reasonable support for the finding that individuals tend to hold more positive worldviews if they have a higher level of resilience.

### **The effects of written disclosure on psychological and physical health**

It is clear that stressful life events have a negative impact on a person's health, both physically and psychologically. However, research has shown that translating these experiences into written language can help mitigate the negative consequences of stressful life events (for a review see Smyth, 1998). According to Pennebaker and Segal (1999), individuals are better able to deal with difficult life circumstances by changing the way they understand such events through written disclosure. When controlling for gender and other possible covariates, the current results indicated that participants who wrote about stressful events showed significant improvements in psychological and physical health at the end of treatment compared to those who wrote about typical day-to-day activities such as cleaning, which supported Hypothesis 2.

Further examination of results showed that participants reported fewer physical health problems at the end of the study if they wrote about their stressful experience rather than if they wrote about more mundane topics. Results also demonstrated that participants who wrote about their most stressful life experience reported fewer physical health symptoms, greater personal growth, and more positive views of themselves and others at the end of the study relative to initial scores. In contrast, participants who wrote about other topics (such as cleaning or how to organise a party) reported significantly more physical health problems and lower hardiness at the end of the experiment compared to their initial scores. As a large portion of the sample consisted of university students, this finding might have occurred due to stress of the semester increasing as they were enrolled in the experiment. Results showed that there was a slight reduction in anxiety symptoms over time for those who wrote about stressful experiences, whereas those who wrote about non-stressful day-to-day events tended to

report more anxiety at the end of the experiment relative to their baseline scores. In addition, depressive symptoms remained fairly stable over time for those who wrote about their stressful experiences and increased for those who wrote about non-stressful topics. It is also possible that participants randomly assigned to the control condition may have reported higher levels of anxiety and depression over the course of the experiment as they were aware they did not receive any form of treatment to work through their stressful experiences. When this opportunity did not arise, they may have felt let down and therefore experienced inflated symptoms of anxiety or depression, or overestimated such symptoms due to annoyance. It was also found that participants who wrote about stressful events experienced a slight increase in self-efficacy over the course of the experiment, whereas those who wrote about more mundane topics reported a slight reduction in self-efficacy. Participants who wrote about their stressors were better able to view stressors as a challenge, whereas those who wrote about mundane topics had difficulty seeing a positive side of their stressful experience. Although stressful life events are often regarded as having a deleterious impact on individuals, the combined results suggest that written disclosure may assist individuals to confront overwhelming events and bestow an opportunity for personal growth, physical health, and emotional well-being. However, results were not uniformly positive and participants did not show improvements on some measures.

The latter results replicate research that utilised the standard Pennebaker writing paradigm in comparison to a control group (Pennebaker et al., 1988). In the current study, participants in the experimental condition were asked to write about the emotional and cognitive aspects of their most stressful life experience. According to Foa and Kozak's (1986) emotion processing theory, individuals need to recall and recount past

stressful experiences in order to recover from such events. Specifically, individuals need to be confronted with the feared event (exposure techniques) within a safe environment and given information that is incompatible with the feared event (Foa & Rothbaum, 1998). According to this model, adjustment to stress occurs when people process both emotional reactions to stress and engage in cognitive processing. Cognitive processing refers to a person's ability to make sense of an event or to increase their understanding and acceptance of the experience (Ullrich & Lutgendorf, 2002). It has been suggested that written emotional disclosure provides individuals with the opportunity to more appropriately process and understand the feared event, which may then lead to a reduction in distress (Klein & Boals, 2001; Pennebaker, 1993; Pennebaker, 1997). In line with this notion, Sloan, Marx, and Epstein (2005) found that repeated written expression of traumatic experiences significantly reduced PTSD symptoms, depression, and self-reported physical health symptoms. Other theories have drawn on the Freudian explanation of catharsis to explain the beneficial effects of written emotional disclosure. One explanation suggests that not disclosing is physiologically difficult as it involves a level of inhibition (Mowrer, 1960). Mowrer's (1960) two-factor theory suggests that inhibiting (avoiding) emotions and thoughts surrounding stressful experiences can lead to psychological and physical difficulties, suggesting that emotionally expressing such feelings via writing should improve overall health and well-being.

Emotion processing theory states that a person's inability to process trauma-related material is consequential to the development of psychological conditions (Foa & Cahill, 2001; Foa & Kozak, 1986; Foa & Rothbaum, 1998). Unprocessed stressors and traumatic memories tend to be recalled in a disjointed sensory and affective manner,

rather than being recalled within the broader context of the whole experience (van der Kolk & Fisler, 1994). It has been suggested that individuals benefit from psychological interventions that increase the organisation of their traumatic memories, as the disorganised nature of the memory becomes resolved or somewhat alleviated (Foa, Molnar, & Cashman, 1995; Foa & Riggs, 1993). Although it is unclear how writing influences health, the process of writing may allow individuals to organise their memories in a way that encourages reprocessing. Participants in the written disclosure condition had the opportunity to develop more organised accounts of their distressing life events through the process of written expression when compared to those who only wrote about mundane topics. As the participants in the written disclosure condition generally fared better physically and psychologically when compared to those in the control group, this provides some support to the claim that increasing the organisation of thoughts and emotions' relating to stressful events is needed to assist in recovery. However, this view contrasts with the argument that self-deception or repression can be useful in stressful circumstances. Clinically oriented research by Nachson (2001) revealed that self-deception may assist traumatised individuals to forget aspects of their ordeal. The traumatised individual is able to prevent the trauma from entering consciousness, thereby allowing them to maintain positive views of the self and reality (Nachson, 2001). Perhaps a degree of self-deception or denial is needed to promote psychological health, whereas atypical low levels of self-deception result in psychopathology (Surbey, 2004). Future research needs to be conducted to determine whether low self-deceivers benefit from written disclosure, or whether alternative procedures would be more helpful in promoting psychological and physical health.

### **The role of resilience in improving health following written disclosure**

Not only did this study explore the benefits of written emotional disclosure, it also aimed to demonstrate whether such improvements could be explained by the degree of resilience maintained by individuals. After controlling for demographic and other methodological variables, correlational analyses suggested that people in the written disclosure condition who developed improved hardiness and self-efficacy (following written expression of stressful life experiences) were more likely to experience enhanced psychological and physical health, which supported Hypothesis 3. Specifically, results showed that participants reported fewer anxiety symptoms, fewer physical symptoms, less depression, higher posttraumatic growth, and more positive personal beliefs and worldviews. These results make sense as individuals are more likely to believe that they can influence their outcomes and cope with adverse events if they have high levels of self-efficacy (Aspinwall & Richter, 1999; Benight & Bandura, 2004). In a similar vein, individuals high in hardiness are able to view new situations as challenges, are committed to completing tasks, and feel in control of their outcomes (Funk, 1992). It is interesting to note that when examined using more sophisticated analyses, the World Assumption Scale score was the only variable to significantly change following written disclosure as a result of changes in resilience. In particular, it was found that participants who developed higher self-efficacy after writing about their stressful life experiences tended to report more positive beliefs about themselves and the world at the end of the study compared to their initial scores.

This study builds on previous work, as no prior studies have examined the combined impact of written emotional disclosure and the resilience variables of hardiness, self-efficacy, social support, and self-deception. The current study showed

that improved hardiness and self-efficacy has beneficial consequences for those who write about personally distressing events. However, this study did not explore whether changes in self-deception or perceptions of social support influenced outcomes. Some researchers have suggested that these variables are relatively stable characteristics that remain unchanged despite exposure to new experiences (Kendler, 1997; Lee & Klein, 2002; Sarason, Sarason, & Shearin, 1986), whereas other researchers claim that social support and self-deception may fluctuate (personal communication M. Surbey, 2008). Future research should be conducted to determine if changes in self-deception and social support over time effects whether written emotional disclosure promotes health and overall well-being. Alternative individual differences such as personality characteristics (neuroticism, optimism, and emotional inhibition) could also be explored to explain the different outcomes following experimental disclosure.

### **Improvements in physical and psychological health linked to demographic and methodological variables**

Some demographic and methodological variables were related to changes in physical and psychological health among those who wrote about personally distressing experiences. Individuals who wrote about stressful experiences reported significantly less anxiety over the course of the experiment if they completed a greater number of journal entries (with a maximum of three). This finding conflicts with the meta-analytic results of Smyth (1998) who found that overall health was not significantly affected by number of disclosure sessions. However these results support those of Frattaroli (2006) who found that psychological health improved when individuals completed more written disclosure sessions (three sessions or more sessions compared to fewer than three

sessions). The current study also found that individuals in relationships developed significantly lower threat appraisals of their stressor following written emotional disclosure, compared to those who were not in relationships. In addition, results demonstrated that women tended to view their stressful experience as significantly less threatening after engaging in written disclosure when compared to men. This finding is in line with the results of Crow (2000) who found that women tend to benefit more from written emotional disclosure, but conflict with the results of another study (Donnelly & Murray, 1991). This finding is noteworthy as there has been speculation that men experience greater benefits from written disclosure because it provides an anonymous and structured context for men to reveal vulnerable feelings (Park & Blumberg, 2002; Ullric & Lutgendorf, 2002).

The current study also found that a person's age, education level, stress exposure in the past year, number of lifetime traumas, and previous reactions from confidants' following stress-related disclosure were not significantly related to changes in physical or psychological health over the course of the experiment. The fact that age was not related to outcomes was interesting, given that older participants who have had a longer period to ruminate over unpleasant experiences may be more resistant to changes in health following written disclosure (Hemenover, 2003). Future studies should continue to explore the interaction between demographic and methodological variables, and treatment outcomes to more fully understand their relationships. These variables are generally not the focus of most studies but these relationships may need to be considered or controlled in future research.



**Issues of importance relating to written disclosure**

Given that all participants were told in advance that there was a possibility that they may be asked to write about personally distressing events, it is possible that expectancy effects or demand characteristics may have biased the results if participants became aware of the condition to which they were assigned because of the writing instructions they received. To reduce this possibility, the information given to participants about the study (in the information and consent forms) was sufficiently vague so that participants were unlikely to guess the goals and design of the study. A conscious effort was also made to create a unique set of journal entry instructions for this study that were congruent with the original instructions of Pennebaker and Beall (1986) but reduced the chance of demand characteristics. Specifically, the journal instructions encouraged participants to write with as much depth and length in both conditions. Previous studies possibly primed participants to their respective conditions by making the instructions more detailed for the written disclosure condition and more brief for the control group. By attempting to design equivalent writing instructions, there was a reduced chance that control participants were aware that they were being compared to members of the experimental group, a process known as compensatory rivalry (L'Abate & Kern, 2003). Comments made by participants at the end of their questionnaires made no reference to them being aware of the goals or design of the study. In addition, the non-uniformity of the results argues against a general bias on the part of the involved participants. Using a large sample size and experimental design, further research should be conducted to examine if alternative writing instructions given to participants' results in better outcomes in comparison to those who receive the standard writing instructions. Additionally, the follow-up period used in this study may

represent another limitation. Different outcome effects might have occurred with shorter or longer follow-up periods. When debriefing participants, it was found that individuals tended to spend time thinking about their stressful experiences between writing sessions. This suggests that it may be useful to collect additional data between writing sessions to more accurately examine factors that contributed to improvements. Future studies could be conducted using multiple follow-up assessments to investigate the beneficial effects of written disclosure over different durations. This low-cost intervention could have broad applicability if future research continues to show that this method has long-term benefits in reducing psychological and physical difficulties.

Overall, this study showed that writing about personally distressing events is beneficial in lowering self-reported physical health problems such as having a cold. Written disclosure also appears to have allowed people to learn from such experiences and grow, increased hardiness, and helped individuals to develop more positive beliefs about themselves, others, and the world. The current study also highlighted the need to continue examining demographic and methodological variables to more fully understand improvements following engagement in the written disclosure paradigm. Future research should be conducted to determine if improvements in physical and psychological health are related to other factors, such as the number of journal entries completed by participants, gender effects, and relationship status. This study builds on previous work, as no prior study has examined the combined impact of written emotional disclosure and the resilience variables of hardiness, self-efficacy, social support, and self-deception. A unique finding of this study was that participants in the written disclosure condition reported better physical and psychological health if they developed improved hardiness and self-efficacy following written expression of their

most stressful life experiences. Thus, it appears as though participants may have improved their hardiness and self-efficacy by engaging in the written disclosure process, suggesting that this may be a useful, non-invasive strategy to use when faced with overwhelming events. Written disclosure is a cost-effective process that allows people to confront unpleasant experiences at their own rates, is free of potentially negative social feedback, and encourages people to devise their own solutions to problems. Above all, written disclosure may be used as an alternative form of treatment for individuals who are disinclined to enter talk therapy.

## CHAPTER 8

### **Study 3: Resilience, emotional disclosure, world assumptions, and psychological and physical health following attendance at a PTSD group therapy program**

Military populations sent to wars or peacekeeping operations are likely to experience overwhelming trauma, hence such populations are at greater risk of developing PTSD (Litz, Orsillo, Friedman, Ehlich, & Batres, 1997). Furthermore, military deployments present a range of unique stressors that may lead deployed personnel to question held beliefs about the self and world. The aim of Study 3 was to examine what factors contributed to improvements following participation in a PTSD group therapy program of known efficacy. Specifically, this study examined whether resilience (hardiness, self-efficacy, social support, and self-deception) and emotional disclosure of traumatic experiences within a group environment were related to improvements in psychological and physical symptoms, quality of life, and assumptions about the world and self.

#### **Posttraumatic stress disorder (PTSD)**

A broad range of social, physical, and psychological difficulties have been found to be associated with exposure to traumatic life events. Since PTSD was formally recognised as an anxiety disorder in the Diagnostic and Statistical Manual-Third Edition (DSM-III), researchers have attempted to clarify and describe the phenomenology of PTSD (Amsundson et al., 2000). The Diagnostic Statistical Manual-Fourth Edition (DSM-IV) indicates that the symptoms of PTSD include: 1. Intrusive and re-experiencing symptoms; 2. Avoidance and emotional numbing symptoms; and 3. Hyperarousal symptoms. Although trauma may affect a whole range of core

psychological thoughts, feelings and behaviours, the basic symptoms of intrusion and re-experiencing, avoidance, and hyperarousal are intrinsic to a diagnosis of PTSD.

**Intrusion and re-experiencing symptoms.** As evinced in earlier reviews of the literature, traumatised individuals who do not develop PTSD are able to integrate the negative event as a past experience, whereas those diagnosed with PTSD continually relive the traumatic event in the present via behaviours, emotions, images, and physiological states. Involuntarily re-experiencing aspects of traumatic events is one of the cornerstones of posttraumatic stress disorder (Baum, Cohen, & Hall, 1993). When an individual is re-experiencing the trauma, emotional responses and sensory impressions from the original event emerge. Those afflicted with PTSD usually experience a reduced quality of life as a result of intrusive symptoms, which restrict their ability to function and perform basic needs. Intrusive recollections can take the form of thoughts, memories, flashbacks, dreams, intense emotions, interpersonal re-enactments, pervasive life themes, and sensory impressions such as auditory, olfactory, and tactile sensations (Laub & Auerhahn, 1993; Steil & Ehlers, 2000). A longitudinal study demonstrated that intrusive thoughts and images are most prevalent when the individual first develops PTSD, but such intrusive symptoms tend to dwindle over time (McFarlane, 1989b).

Researchers have proposed that re-experiencing traumatic material may lead to subsequent exposure to threatening situations. According to Polunsky and Follette (1995), young survivors of traumatic events often re-experience negative affect and cognitions associated with the trauma. In order to cope, these individuals may utilise avoidant strategies such as dissociation and substance abuse, thereby interfering with the individuals' ability to respond appropriately to dangerous situations. In a similar vein,

van der Kolk (1989) reported that individuals with PTSD who re-experience the trauma are more likely to be exposed to ongoing traumas as a result of ineffective coping strategies, such as dissociation and numbing of affect. Although such strategies are intended to minimise the aversive consequences of the threat, these approaches may, in effect, facilitate exposure to traumatic events. Although a range of traumatised populations have displayed a compulsive tendency to engage in situations reminiscent of the trauma, other studies have failed to show such re-enactments. For example, Chu (1992) reported that individuals who initially develop re-experiencing symptoms are less likely to be re-traumatised by threatening situations as they develop an enhanced ability to recognise potentially threatening circumstances.

**Avoidance and emotional numbing.** In discussing the symptomatology of PTSD, Foa and colleagues (1984) reported that emotional avoidance occurs at a frequent rate. Avoidance of triggers may take the form of consuming alcohol to numb awareness of the traumatic event, or keeping away from places that serve as reminders of the trauma (Foa, Steketee, & Young, 1984). Researchers have become interested in processes of affective and cognitive avoidance commonly observed among those exposed to trauma and have been referred to as dissociation (Spiegel, Hunt, & Dondershine, 1988) and emotional numbing (Litz, 1992). Emotional numbing refers to deficits in the expression of emotions, feelings of aloofness from others, and apathy in conventionally enjoyable activities (Litz & Miller, 2004). Evidence suggests that the reduced emotional expressivity of PTSD patients may arise because such individuals either consciously or unconsciously avoid encountering strong affect (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Dissociation is largely defined by a set of

symptoms including emotional detachment, feelings of estrangement, out-of-body experiences, flashbacks, and abreaction.

**Hyperarousal symptoms.** Although people with PTSD tend to experience emotional constriction, many traumatised individuals display elevated levels of physiological arousal in response to various stimuli (Pitman, Orr, Forgue, deJong, & Claiborn, 1987). Pitman and colleagues (Pitman, Orr, Forgue, Altaian, & Herz, 1990; Pitman, Orr, Forgue, deJong, & Claiborn, 1987) demonstrated that heightened levels of autonomic arousal was not the consequence of an individual's susceptibility toward developing PTSD, rather hyperarousal was an outcome of traumatic experiences. Individuals with PTSD have heightened autonomic arousal levels and even minor threats can trigger startle reactions or negative emotions such as anger, fear, anxiety, or panic.

Various theories have suggested that hyperarousal symptomatology may, in effect, facilitate future exposure to traumatic events. For example, van der Kolk (1989) suggested that survivors of child sexual abuse tend to develop physiological hyperarousal that may hinder their ability to adequately assess and react to subsequent threatening situations. In strict contrast to van der Kolk (1989), Wilson, Calhoun and Bernat (1999) proposed that heightened levels of PTSD-related arousal led to an increased ability to recognise threatening situations. Therefore, it would appear as though greater PTSD arousal may increase an individuals' selective attention to threatening stimuli, thereby protecting them from further traumatic experiences. However Marx, Heidt, and Gold (2005) acknowledged that the efficacy of Wilson et al.'s (1999) cross sectional design was flawed because the study did not resolve the matter of causation. One cannot determine whether hyperarousal was caused by a

heightened ability to recognise threat, or whether threatening situations increased one's hyperarousal.

Schell, Marshall, and Jaycox (2004) demonstrated the importance of examining hyperarousal levels of patients with PTSD. Their findings revealed hyperarousal as an important predictor of the severity of other PTSD symptoms, suggesting that it largely influences subsequent symptom expression. Therefore, psychologists should be attentive to the possibility that therapeutic interventions may be most beneficial for PTSD patients if the initial aim of the treatment is to reduce arousal levels (Schell, Marshall, & Jaycox, 2004). Individuals with heightened levels of reported arousal tend to be more susceptible to long-lasting disturbances when compared to persons with low levels of arousal (Bryant & Harvey, 2000).

### **Assessment of PTSD**

A number of questionnaires and semi-structured interviews have been devised to screen for PTSD. PTSD has multifaceted presentations and is a difficult condition to diagnose. Due to its multifaceted nature, the most reliable diagnostic approach is to use a wide range of assessment tools. Structured clinical interview measures are one of the commonly used diagnostic instruments for PTSD. Clinical interviews are conducted by a trained mental health professional who guides clients through a battery of questions that focus on the condition to be assessed. Although the interviewer is required to follow standard instructions while conducting the assessment, professional judgment is a necessary component of scoring responses.



**Clinician Administered PTSD Scale (CAPS).** A commonly used structured interview measure is the Clinician Administered PTSD Scale (CAPS; Blake et al., 1995). The CAPS is a standardized interview, which ensures that all participants receive consistent instructions when completing the instrument. Regarded as the ‘gold standard’ for diagnosing PTSD, the CAPS measures the frequency and intensity of symptoms experienced by clients who have been exposed to traumatic events. Several versions of this structured interview have been developed, including the CAPS-1, CAPS-2, and the CAPS-Revised. The CAPS-1 is based on the 17 core symptoms of PTSD set forth in the DSM-III-R (1987), as well as 8 items associated with PTSD: global ratings of severity, validity and symptom improvement; survivor guilt; derealisation; depersonalisation; reduced awareness of surroundings; and guilt following acts of commission or omission (Blake et al., 1990). The CAPS-1 was designed to measure lifetime PTSD status and current symptoms over the past month, whereas the CAPS-2 assesses PTSD symptoms experienced by individuals over one week intervals (Blake et al., 1995). Despite their utility, the earlier versions of the CAPS do not examine frequency and intensity of all the symptoms of PTSD (as stipulated by DSM-IV criteria). To compensate for this limitation, the CAPS-Revised was developed and remains the current diagnostic version for this clinician-administered instrument. The CAPS-Revised measures the 17 symptoms of PTSD stipulated by the DSM-IV in addition to 5 associated features: dissociation; guilt; derealisation; depersonalisation; and a reduced awareness of surroundings (Blake et al., 1998).

A number of other shortcomings exist with regard to the CAPS. For example, this scale does not specifically measure what it claims to examine. Although the CAPS provides a frequency rating for each symptom of PTSD, this scale does not appear to

adequately measure the severity of symptoms in accordance with the DSM-IV criteria. The DSM-IV definition of PTSD states that individuals must experience distress as a result of the initial traumatic event *and* experience distress in response to the symptoms of PTSD (Association, 2000). As the CAPS focuses on the impact that the initial traumatic event had on individuals, and fails to consider distress that arises from the symptoms of PTSD, this scale does not measure all aspects of PTSD as defined by the DSM-IV. Another limitation of this instrument is that it is quite time consuming and cumbersome to complete and administer.

**The PTSD Checklist (PCL).** The PCL is a self-report questionnaire that measures the symptoms of PTSD as stipulated by the DSM-IV. Developed and validated in samples of predominantly male Vietnam and Persian Gulf War veterans (Weathers & Ford, 1996), the PCL is renowned as one of the first self-report questionnaires that directly measures all aspects of PTSD as outlined by DSM-IV criteria. Although the majority of studies aimed at assessing the psychometric properties of the PCL tended to use female participants traumatised by motor vehicle accidents, sexual abuse, or cancer-related conditions (Andrykowski, Cordova, Studts, & Miller, 1998; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Manne, Du Hamel, Gallelli, Sorgen, & Redd, 1998), the validity of the PCL has been established with veteran populations. A study conducted with male Vietnam veterans ( $N = 97$ ) demonstrated that the PCL has moderate diagnostic accuracy and is moderately correlated ( $r = .30$ ) with the CAPS which has been regarded as the 'gold standard' for diagnosing PTSD (Forbes, Creamer, & Biddle, 2001). Forbes and colleagues (2001) indicated that there is a tendency for participants to underestimate or underreport

improvements in PTSD symptoms following treatment, possibly as result of demand characteristics or social-desirability. Although shortcomings exist, Keane and colleagues (1989) suggested that it is imperative to use self-report inventories in order to obtain a personal account of adjustment following trauma.

### **Factors contributing to the development and maintenance of PTSD**

Scholarly interests in clarifying the factors that contribute to the development and maintenance of PTSD have increased in recent years (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Prinstein, LaFeca, Vernberg, & Silverman, 1996; Taylor, Kuch, Koch, Crockett, & Passey, 1998). Research has shown that recovery from trauma is influenced by a range of factors, including aspects of the traumatic event, pre-existing characteristics of the individual, and the individual's psychological resources.

**Aspects of the traumatic event.** An individual's immediate reaction to a traumatic event explains only a portion of the variance in subsequent psychopathology. In addition, the degree of exposure and characteristics of the traumatic event largely influence how an individual will respond to threatening events or situations (Brent et al., 1995). PTSD is more likely to develop when individuals experience a perceived threat to life, personal injury, or if they witness the death of others (Prinstein, LaGreca, Vernberg, & Silverman, 1996). McCann and Pearlman (1990) recognised that the prime determinants of developing PTSD included witnessing the death of non-combatants, being seriously wounded, and viewing carnage. In accordance with these assumptions, it was proposed that threat to life, deliberately being harmed, witnessing violence towards significant others, severe physical harm, and exposure to grotesque events

contribute to the development of PTSD (Green, 1990). Evidence also suggests that peritraumatic dissociation (such as “blinking out” or experiencing an altered perception of time) is linked to the development and maintenance of PTSD (Marmar et al., 1994, Schnurr, Lunney, & Sengupta, 2004).

The severity of the traumatic event, in terms of intensity of a torture experience (Basoglu et al., 1994) or combat intensity and duration (McFall, Mackay, & Donovan, 1991; Yehuda, McFarlane, & Shalev, 1998), has also been implicated as one of the best predictor variables for PTSD (for a review, see March, 1993). For example, research has demonstrated that the prevalence and severity of PTSD is influenced by combat exposure with those involved in highly combative situations more likely to develop posttraumatic stress (Kaylor, King, & King, 1987; McCann & Pearlman, 1990; Oei, Lim, & Hennessy, 1990). A meta-analytic study (N = 49 studies) demonstrated that trauma severity predicted PTSD, with an average weighted effect size of 0.23 (Brewin, Andrews, & Valentine, 2000). Goldberg and colleagues (1990) found that PTSD occurred at higher rates for a twin that was exposed to dangerous combat situations in Vietnam, compared to the monozygotic twin who did not serve in combat.

**Pre-existing characteristics of the individual.** When mental health professionals become aware that an individual has experienced a traumatic event, it is easy to view all of their problems as stemming from the traumatic experience. Other factors that have a prominent role in the development or maintenance of PTSD may be ignored (Davidson, Smith, & Kudler, 1989; Herman, 1992). Although there was a consensus among researchers that the severity of the trauma is the most instrumental factor in the development of PTSD, other researchers subsequently have challenged this

view (Frye & Stockton, 1982; Stretch, 1986). In addition to the severity of traumatic events, demographic characteristics and pre-trauma functioning appear to be related to responses to traumatic events (Yehuda & McFarlane, 1995). Researchers have reported associations between age and symptoms following exposure to a traumatic event (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). For example, prevalence rates of PTSD were significantly higher for men as they became older, however age-related differences in PTSD symptomatology were not significant among women (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Some researchers suggest there is not a relationship between gender and PTSD symptoms (Terr, 1981), whereas Green et al. (1991) reported that women internalize higher levels of distress. On the basis of previous findings, women appear to have a tendency to report more frequent and severe psychological difficulties in the aftermath of traumatic events when compared to men (Breslau et al., 1998; McFarlane & de Girolamo, 1996). A review by Tolin and Foa (2006) indicated that, in general, women experience more frequent and severe symptoms of PTSD in comparison to men. An explanation as to why women generally experience PTSD more than men is because women report more peritraumatic dissociation (such as depersonalization or disorientation immediately after the trauma), which is one of the strongest predictors of PTSD (Fullerton et al., 2001; Ozer, Best, Lipsey & Weiss, 2003). However, research has shown that military and police samples typically fail to show gender differences in PTSD (Brewin et al., 2000; Pole et al., 2001). In addition, a comprehensive meta-analysis did not find a correlation between gender and the severity of PTSD symptoms in military samples ( $r = .00$ ) as compared to civilian samples ( $r = .13$ ) where a statistically significant relationship was found (Brewin et al., 2000). It has been suggested that military and police populations tend not to show gender differences

in PTSD symptoms because such cultures encourage individuals to embrace more masculine gender roles (Burke, Richardsen, & Martinussen, 2006), including minimizing fear during threatening work-related experience. Lily et al., (2009) found that female police officers who maintained masculine occupational expectations reported lower peritraumatic distress than their civilian counterparts, and were also found to report lower PTSD symptoms.

Several researchers have suggested that predisposing physiological factors, such as reduced hippocampal volume and overactive hormonal systems, may be sufficient conditions for the development of PTSD (True, Rice, Erisen, Heath, & Goldberg, 1993; Yehuda, Resnick, Kahana, & Giller, 1995). Other factors that may predispose individuals to develop PTSD include pre-existing psychopathology or a family history of psychopathology (Brent et al., 1995; Davidson & Nemeroff, 1989; Davidson, Smith, & Kudler, 1989). A recent meta-analysis of twin and family studies (N = 9 studies) demonstrated that a family history of psychopathology significantly predicted PTSD (average weighted effect size = .17) (Ozer, Best, Lipsey, Weiss, 2003). According to the psychiatric vulnerability model, prior psychological histories predispose people to experience further psychological symptomatology (Atkeson, Calhoun, Resick, & Ellis, 1982). Breslau and colleagues (1991) reported that pre-existing depression or anxiety increases a person's risk of developing PTSD. Furthermore, an epidemiological study demonstrated that a substantial portion of individuals with PTSD also had high levels of obsessive-compulsive disorder, dysthymia, bipolar disorder, and substance abuse disorders (Helzer, Robins, & McEvoy, 1987). Other researchers concur that a prior history of treatment for psychological disorders influences one's vulnerability to PTSD (McFarlene, 1988b, North & Smith, 1992; Schnurr, Friedman, & Rosenberg, 1993). In

adult populations, the development of PTSD appears to increase if the traumatised individual comes from a family with a history of anxiety disorders, or if the individual suffers from pre-existing depression or anxiety prior to the trauma (Breslau, Davis, Andreski, & Peterson, 1991). This finding has been replicated in younger populations, wherein PTSD was predicted by previous psychopathology and a family history of psychiatric disorders, such as anxiety, depression, and suicide attempts (Brent et al., 1993). However, one should be cautious when interpreting these results as a small sample ( $N = 28$ ) was utilised. Nevertheless, this study showed that family history and personal psychopathology influenced one's tendency to develop PTSD, thereby providing support for the results of other researchers (Brent et al., 1993; Green, Grace, Lindy, Glesner, & Leonard, 1990; Shore, Tatum, & Vollmer, 1986; Smith, North, McCool & Shea, 1990).

Other non-clinical factors that appear to influence the development of PTSD include whether an individual generally displays an optimistic or pessimistic attitude. Specifically, it appears as though an individual's mode of thought is related to the onset and maintenance of PTSD (Horowitz, 1986). Janoff-Bulman (1989a) speculated that individuals with high levels of positive pre-trauma beliefs are more vulnerable to the shattering of their basic cognitive schemas regarding themselves and the world, and are therefore more inclined to develop PTSD in the face of trauma. This suggestion was not supported by Foa and Riggs (1993), who reported that negative beliefs prior to trauma were associated with more severe and persistent PTSD symptomatology. Negative life experiences, such as parental divorce, poverty, and diminished educational opportunities, also influence the likelihood of exposure to trauma and PTSD following such exposure (Breslau, Davis, Andreski, & Peterson, 1991; Davidson, Hughes, Blazer,

& George, 1991). In a study of Vietnam veterans, it was concluded that individuals with low pre-trauma intelligence levels were more likely to develop PTSD-related symptoms (Macklin et al., 1998).

**The individual's psychological resources.** Humans are social beings who tend to seek out close emotional affiliations. Because emotional relationships can help protect people from traumatisation (Finkelhor & Browne, 1984; McFarlane, 1988b), one of the core issues in therapy is to provide, re-establish, and maintain social support. Empirical researchers have demonstrated that social support largely influences whether a traumatised individual will develop a disorder (Harel, Hahana, & Kahana, 1993; Perry, Difede, Musngi, Frances, & Jacobsberg, 1992). Social support plays a key mediating or moderating role in the negative consequences of stressors on psychological health and well-being (Ensel & Lin, 1991). However the usefulness of social support has been questioned by the finding that, after experiencing a health-related trauma, individuals who lacked social support but had a good sense of personal control had greater psychological health when compared to those that had good social support and low levels of personal control (Kobassa & Puccetti, 1982). Thus, a high level of social support does not always result in positive outcomes. It seems as though the effectiveness of social support is influenced by the degree to which such support encourages the victimised individual to work through the impact of the trauma.

Evidence suggests that the quality of social support that Vietnam veterans (N = 200) received from family and friends currently and immediately following their service predicted PTSD symptoms. More specifically, post-service social support is necessary to help circumvent the development or continued experience of PTSD symptoms



following exposure to combat (Green, Grace, Lindy, Gleser, & Leonard, 1990).

Likewise, a study of combat veterans that served in Vietnam (N = 925) indicated that PTSD symptomatology was moderated or exacerbated by the quality of social support received during active service and the first year returning from duty (Stretch, 1985). In contrast, Laufer and Gallops (1985) conducted a larger scaled study of Vietnam combat veterans, non-veterans, and era-veterans (N = 1259), which found that stress and psychological well-being was not influenced by family support.

Studies have shown that the benefits of unburdening stress-related feelings to a marital or romantic partner depended on the quality of the relationship (Kennedy, Kiecolt-Glaser, & Glaser, 1990). Thus, the type of reactions that victims receive from confidants (the person or group of people to whom traumatised individuals disclose their trauma) appear to affect post-trauma outcomes. Sometimes people within support networks blame victims for bringing traumatic experiences upon themselves (Symonds, 1982). In some cases, lacking social support and being held responsible for tragic events resulted in more lasting negative reactions among victims when compared to the traumatic event itself (Lifton, 1983). In a similar vein, it was reported that the interpretation of other people's responses following a trauma is more important than the actual emitted responses (Keane, Scott, Chavoya, Lamparski, & Fairbank, 1985). Perceiving others to react in a negative or unsupportive manner following exposure to a traumatic event appears to have a greater impact on posttraumatic psychopathology than a lack of positive reactions (Davis, Brickman, & Baker, 1991).

Researchers have suggested that some degree of cognitive distortion is necessary for psychological well-being (Nachson, 2001; Sackeim & Gur, 1978). If the tendency to distort reality is associated with mental health, then one would expect low self-deception

to be associated with psychological difficulties. According to Nachson (2001) self-deception has psychological benefits as it allows victims of traumatic events to repress memories of the ordeal. Recall that self-deception refers to the process of maintaining two contradictory beliefs, with only one belief entering conscious awareness.

Traumatized individuals may be motivated to prevent the trauma from entering consciousness, making self-deception a process that disallows negative, yet accurate, views of reality from reaching awareness (Gur & Sackeim, 1979; Nachson, 2001; Sackeim & Gur, 1978). If mild self-deception is necessary to promote psychological health, then atypical levels of positive illusions or self-deception may result in psychopathology. It seems highly plausible that traumatic events interfere with a person's normal ability to adaptively deceive oneself, resulting in mental health problems (Surbey, 2004) such as PTSD and its related conditions. The current study aims to explore whether baseline levels or an increase in self-deception over time is related to a reduction in symptomatology among a group of participants attending a group PTSD program.

Other forms of resilience assist people to deal with traumatic events. A study (N = 1632) using structural equation modelling explored whether hardiness, post-war social support (functional and structural), and recent stressful events were important factors predicting PTSD in a sample of male and female American Vietnam veterans (King, King, Fairbank, Keane, & Adams, 1998). Overall, King and colleagues (1998) found that veterans who reported higher hardiness scores exhibited fewer PTSD symptoms. The authors of this study suggested that hardiness plays an important role in posttrauma adjustment, as it was the strongest predictor of PTSD when compared to the other resilience factors.

Self-efficacy also effects the reactions of individuals faced with traumatic events. Inefficacious thinking constitutes one risk factor for stress reactions in the aftermath of traumatic experiences. When examining the impact of war on Lebanese adolescents, Saigh and colleagues (1995) found that traumatised individuals with PTSD reported a lower sense of self-efficacy compared to traumatised individuals without PTSD or non-traumatized adolescents. Solomon and colleagues (1991) examined the effects of military traumatization on self-efficacy among a sample of Israeli soldiers who fought during the 1982 Lebanon War. Stepwise multiple regression analyses showed that one year after the combat experience, 44% of the variance in perceived self-efficacy was explained by current PTSD symptoms, the severity of psychiatric symptoms, pre-military coping abilities, and psychic numbing in combat (for example, playing dead). Specifically, psychic numbing during combat was the best predictor of reduced self-efficacy scores one year following the traumatic incident. However, the predictors of self-efficacy changed over time, with current psychiatric symptoms and pre-military coping abilities being the best predictors of self-efficacy two years after the war. Therefore, specific behaviour during war experiences tend to be more predictive of self-efficacy in the early days after a trauma, whereas more general psychological symptoms appear to predict self-efficacy beliefs three years after a war-related trauma. These findings highlight the need to examine the impact of resilience factors on the psychological health of veterans over time.

### **Comorbidity and PTSD**

According to Breslau and colleagues (1991), individuals have a heightened chance of experiencing additional stressors following exposure to a highly stressful or

traumatic event. Accordingly, as exposure to traumatic events increases a person's risk of future exposures to trauma, the possibility of developing PTSD in response to such events is also augmented (Helzer, Robins, & McEvoy, 1987). In a similar vein, those individuals with a pre-existing disorder are at greater risk of developing PTSD in the aftermath of trauma exposure (Breslau, Davis, Andreski, & Peterson, 1991). This is supported by the finding that high levels of comorbidity exists among PTSD populations in both clinical and community settings (Keane & Wolfe, 1990). Thus, it appears as though comorbid disorders and exposure to numerous stressors increases a person's vulnerability of developing PTSD.

Comorbidity refers to the presence of two disorders in a lifetime, either simultaneously or in isolated episodes (Breslau, Davis, Peterson, & Schultz, 2000). Traumatic events are associated with PTSD and additional comorbid psychopathology, including the DSM Axis I (clinical disorders) and Axis II (personality disorders and mental retardation) conditions. A range of Axis I and Axis II disorders co-occur with PTSD, such as major depressive episodes, suicidal behaviour, dysthymia, anxiety, alcohol and substance abuse and dissociative disorders (such as relationship problems, aggressive reactions, antisocial behaviours, and borderline personality disorder) (Brady, Killeen, Brewerton, & Lucerini, 2000; Kamen, 2002). For example, an extensive study (N = 3461) of American soldiers deployed to Somalia indicated that approximately 8% of troops had the full range of PTSD symptoms five months after returning to the United States, and 23% of these individuals also met diagnostic criteria for at least one other comorbid disorder (Litz, Orsillo, Friedman, Ehlich, & Batres, 1997).

Alcohol and other substance disorders appear to be the most common comorbid conditions associated with PTSD in both clinical and community samples (Brown &

Ouimette, 1999). As trauma exposure may result in enduring negative emotions, individuals may become motivated to engage in behaviours that decrease such feelings (Kilpatrick, Saunders, Veronen, Best, & Von, 1987). Although alcohol use or abuse of other substances may initially seem effective in reducing negative affect, prolonged use of this coping strategy may lead to other problems: cardiovascular disease, cancer, or emphysema (Felitti et al., 1998). According to the *self-medication hypothesis*, people with PTSD may develop substance dependencies as they use alcohol and other drugs in an attempt to alleviate or reduce symptoms of distress (Stewart, 1996). Schnurr and Spirio's (1999) study of 921 male military veterans, found excessive alcohol use to be significantly related to PTSD symptoms. Kulka and colleagues (1990) found that Vietnam veterans with combat-related PTSD symptoms also consumed significant levels of alcohol. Although alcohol use has been consistently linked with PTSD and stressful events, evidence suggests that people often underestimate or distort levels of alcohol consumption (Carney, Tennen, Affleck, Del Boca, & Kranzler, 1998). Thus the link between PTSD and alcohol use may only be a modest representation of the actual relationship of these factors.

Depression is another condition that usually develops among people diagnosed with PTSD. Results from the National Comorbidity Survey indicated that approximately 48% of men and 49% of women with PTSD will develop major depression throughout their lifespan, whereas the prevalence of depression in men and women without PTSD is 12% and 19% respectively (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Retrospective and prospective studies have found that depression occurs significantly more often among trauma-exposed individuals that met criteria for PTSD compared to traumatised individuals that do not develop PTSD (Breslau, Davis,

Peterson, & Schultz, 2000). It is well established that anxiety symptoms are related to heightened anticipation of threat, avoidance of threatening information, and hypervigilance (McLeod & McLaughlin, 1995; McNally et al., 1987; McNally, Rieman, & Kim, 1990). On a similar note, PTSD patients have a tendency to concomitantly experience panic attacks and meet the selection criteria for panic disorder (Davidson, Kudler, Saunders, & Smith, 1990).

Survivors of traumatic events may also suffer from dissociation, which refers to an altered sense of time, out-of-body experiences, disorientation, confusion, depersonalisation, and tunnel vision (Marmar et al., 1994; Weiss, Marmar, Metzler, & Ronfeldt, 1995). As mentioned previously, peritraumatic dissociation is associated with the diagnosis and maintenance of PTSD (Marmar et al., 1994; Schnurr, Lunney, & Sengupta, 2004). Farley and Keaney (1997) found that sexually abused women had higher dissociation if they experienced more physical complaints and had higher levels of other PTSD symptoms. Although empirical evidence suggests a link between trauma and dissociation, other studies have failed to show this association (Friedrich, Jaworski, Huxsahi, & Bengsten, 1997; Rhue, Lynn, & Sandberg, 1995). Research also suggests that individuals with PTSD who experience dissociative symptoms shortly after disclosing traumas are at a higher risk of developing further PTSD-related symptoms (Koopman et al., 2001; Lanius et al., 2002). Interestingly, some researchers have suggested that individuals experiencing dissociative symptoms may inhibit the emotional disclosure of traumatic events (Kaplow, Dodge, Amaya-Jackson, & Saxe, 2005), thus the reverse may also be true: individuals who engage in emotional disclosure of traumatic events may experience fewer dissociative symptoms.

Relationship difficulties and marital distress in the aftermath of trauma is often overlooked when considering morbidity issues, despite its prevalence. With regards to military populations, one could expect that wartime service and military action may create specific marital and family difficulties. In particular, war experiences have the potential to reduce a veteran's ability to relate emotionally to family members, which in effect, is a possible source of marital and family disillusionment (Laufer & Gallops, 1985). Using a small sample of World War II ex-prisoner's of war (ex-POW), Bernstein (1998) found that ex-POWs and their partners reported feeling emotionally detached and distant from one another. Additionally, veterans may develop impaired relationships with significant others as a by-product of increased anger reactivity stimulated from war-related stress (Byrne & Riggs, 1996). It is also possible that traumatised veterans turn to alcohol and other substances in order to help them manage their symptoms. Excessive alcohol consumption may indirectly affect relationships by reducing the veterans contact with family members, thereby leading to social isolation and interpersonal difficulties (Pierce, Frone, Russell, Cooper, & Mudar, 2000). Veterans who have difficulty maintaining close relationships with others, particularly marital unions, have a tendency to experience a greater degree of psychological distress (Laufer & Gallops, 1985). Due to the deleterious effect of trauma on intimate relationships, it has been suggested that individuals undergoing PTSD treatment should receive relationship counselling to help overcome any reported marital or familial dissatisfaction (Riggs, 2000). The current study aimed to measure family patterns and relationship satisfaction by asking participants to complete the Social Support Scale, which explores the degree to which individuals perceive support from significant others.

Recurring findings in the literature have suggested that quality of life is reduced among people with PTSD (Magruder et al., 2004; Schnurr, Hayes, Lunney, & McFall, 2006). PTSD cannot be considered in isolation, as it often presents concurrently with a range of other psychiatric conditions, social difficulties, and emotional problems. Clinicians who are involved in conducting assessments of PTSD survivors need to be aware that such patients may also be experiencing co-occurring psychiatric conditions and difficulties, as this information is necessary when implementing appropriate treatment.

### **PTSD and its relationship to physical health**

It is widely acknowledged that psychological difficulties may appear in the sequela of trauma exposure, however, the relationship between traumatic events and adverse physical health has only become the focus of considerable research in the past decade. Physical health is a multidimensional concept that refers to functional status and health-related quality of life (Wilson & Cleary, 1995). Consistent research has demonstrated substantial links between PTSD and health care utilisation. Utilisation may include visiting primary health care facilities, specialist services, emergency room visits, admissions to hospital settings, and use of pharmaceutical services. Within a primary care setting, individuals meeting criteria for PTSD were significantly more likely to be admitted to hospital for physical health problems, visit medical providers, and see providers of mental health care (such as a psychiatrist, social worker, psychologist or psychiatric nurse), when compared to other non-PTSD patients receiving primary care (Stein, McQuaid, Pedrelli, Lenox, & McCahill, 2000).



A growing body of research has indicated that poor health status is related to PTSD symptoms. For example, veterans with PTSD are more likely to have general health problems when compared to those without the disorder (Morgan, 1993). A longitudinal study demonstrated that veterans with Combat Stress Reactions (CSR) and PTSD reported more somatic complaints one, two, and three years after the 1982 Lebanon war when compared to matched control participants (Solomon, 1988). More recently Schnurr and Spiro (1999) found that poor physical health in older veterans was correlated with PTSD symptoms, as measured by SF-36 scale developed by Ware and colleagues (1993). A methodological concern with this study was that only a small sample of participants (less than 1% of the examined 921 men) met the criteria for PTSD as measured by the Mississippi Scale for Combat-Related PTSD (Keane, Caddell, & Taylor, 1988), and those that did meet criteria had only moderate levels of PTSD symptoms.

The degree to which physical health deteriorates following traumatic events appears to be related to the severity of the trauma-inducing event. Kulk and colleagues (1990) conducted interviews with 1632 Vietnam veterans for the National Vietnam Veterans Readjustment Study and found that physical health was significantly lower among those exposed to higher levels of combat. In a more recent cross-sectional study on 358 mortuary workers (300 men and 58 women) from the United States Army, Navy, AirForce and Marine Corps, it was found that individuals exposed to more severe traumas (such as handling the remains of dead bodies) reported higher somatic symptoms overtime when compared to those not exposed to the remains of bodies (McCarroll, Ursano, Fullerton, Liu, & Lundy, 2002).

## **Forms of treatment for traumatised individuals**

The accumulated knowledge about PTSD has paved the way for the delivery of effective mental health treatment programs to individuals exposed to traumatic events. Although traumatic events frequently occur within societies, investigators are yet to agree on which treatment modality is most effective. In reviewing the literature, it appears as though all forms of therapy aim to help change the basic beliefs that clients hold about themselves and the world. Despite each therapy holding a common objective, the majority of available treatment investigations for trauma have focused on psychopharmacology or cognitive-behavioural therapy (CBT) (Resick, 2001).

**Psychopharmacological treatment methods.** Researchers have suggested that individuals are more prone to developing pathological disorders because of a biological deficiency in the hypothalamic-pituitary-adrenal (HPA) axis (Christopher, 2003; LeDoux, Iwata, Cicchetti, & Reis, 1988; Rothschild, 2000). In order to attempt to regulate PTSD-related problems and symptomology, individuals may be prescribed pharmacological treatments which reduce stress reactions by modulating the HPA axis (Christopher, 2003; Davidson & Nemeroff, 1989). Most drug or psychopharmacological treatments are aimed to relieve or reduce symptoms of PTSD rather than to rid the disorder (Schwartz, 1990). Tricyclic antidepressants and monoamine oxidase (MAO) inhibitors appear to have clear clinical utility for traumatised individuals (Davidson, 1992) as such treatments appear to help regulate locus coeruleus activity (Kolb, 1987). Phenzamine is a MAO inhibitor that has been found to substantially reduce intrusive and avoidance symptomology among PTSD patients (Kosten, 1992), however phenzamine appears to result in sleeping difficulties, dizziness, and sexual dysfunction (Davidson,

Walker, & Kilts, 1987). While pharmacological treatment may be helpful in reducing traumatic distress, Christopher (2003) has suggested that it may interfere with the normal adaptive trauma response. Instead of relying on medication, Tedeschi et al. (1998) and Christopher (2003) assert that it is more important for traumatised individuals to learn meaningful lessons from their traumatic experiences, to improve their sense of competence, to build closer ties with significant others, to appreciate life, to develop stronger beliefs, and to increase resilience to deal with life's challenges. This may be achieved through psychological interventions that employ techniques encouraging self-development and new insight.

**Cognitive behavioural interventions.** Cognitive behavioural therapies (CBT) tend to obtain the strongest empirical support for their success in the treatment of PTSD and trauma (Foa & Rothbaum, 1998; Resick, 2001). This form of therapy helps individuals identify and modify prevailing cognitive distortions into views that are more aligned with reality (Dobson, 1988). CBT treatments often encourage people to examine and provide structure to trauma-related memories (Foa, Rothbaum, & Molnar, 1995), as individuals tend to respond well to treatment that increases the organisation of such memories (Foa & Riggs, 1993).

Anxiety management training (AMT) is a key aspect of CBT treatment of trauma-induced disorders. AMT involves teaching individuals how to identify internal thoughts and physical sensations associated with PTSD, and learn how to overcome or reduce anxiety-related symptoms via a range of techniques (Suin, 1990), such as relaxation training, psycho-education, positive self-talk, cognitive restructuring, and communication skills training. The aim of anxiety management training for those

diagnosed with PTSD is to encourage the processing of traumatic memories within a safe environment, in an attempt to desensitize individuals to intense emotional reactions that are activated by trauma memories. Preliminary evidence suggests that AMT (2 hour weekly sessions for six weeks) significantly reduced intrusive and avoidance symptoms of PTSD amongst a sample of Vietnam veterans diagnosed with combat-related PTSD, however beneficial outcomes are increased by combining AMT with another psychological intervention (Pantolon & Motta, 1998).

Another form of treatment under the rubric of CBT is controlled exposure (Foa, Steketee, & Rothbaum, 1989). Exposure therapy is a therapeutic technique that helps individuals to confront feared objects, events, memories, or images related to a traumatic event with a trusted therapist in a safe environment (Resick & Schnicke, 1992).

Imaginal exposure and *in vivo* exposure are primary components of exposure treatments for PTSD patients that appear to be therapeutic (Fairbank & Keane, 1982; Johnson, Gilmore, & Shenoy, 1982). Imaginal exposure refers to the process of repeatedly reciting and describing traumatic memories, whereas *in vivo* exposure refers to the process of confronting trauma-related situations and objects that result in heightened levels of anxiety (Cooper & Clum, 1989). According to Foa and Kozak (1986), exposure procedures need to activate the feared traumatic event and also provide opportunities for individuals to integrate corrective information into their mental structure. Although individuals may experience some short-term distress, continual exposure to the traumatic event is anticipated to result in a habituation of distress, and thus, a reduction of symptomology (Foa & Kozak, 1986; Foa & Rothbaum, 1998).

Several controlled studies have examined the efficacy of imaginal exposure among traumatised individuals (Boudewyns & Hyer, 1990; Boudewyns, Hyer, Woods,

Harrison, & McCranie, 1990; Cooper & Clum, 1989). It was reported that PTSD symptomology improved for those participants who received exposure therapy in addition to weekly individual and group therapy, compared to those participants who only received the individual and group components of treatment (Cooper & Clum, 1989). In support of this finding, two other studies demonstrated that those participants who received traditional psychotherapy in isolation did not fare as well in as those that received additional imaginal exposure sessions, in terms of adjustment (Boudewyns & Hyer, 1990; Boudewyns, Hyer, Woods, Harrison, & McCranie, 1990). Despite the reported utility of exposure therapy in the aforementioned studies, one should be cautious when interpreting these results as the effect sizes for all 3 studies were quite low. Exposure-based therapies appear to be most beneficial for individuals that have experienced recent traumas and who come from supportive social environments. One should bear in mind, however, that it appears to be contraindicated for individuals with suicidal tendencies, elevated anxiety levels, or ongoing stressors to use the exposure component of CBT (Bryant & Harvey, 2000). Furthermore, exposure-based interventions may intensify distress for individuals reared in emotionally inconsistent or detached environments and who have experienced extensive traumatic events (Herman, 1992).

**PTSD group therapy.** To date, in light of the available evidence, a combination of several treatment modalities appears to be the best intervention for traumatised individuals. Resick and Schnicke (1992) reported that a combination of exposure therapy, cognitive restructuring, anxiety management training, and psycho-education resulted in significantly superior outcomes for sexually assaulted individuals at

discharge and 6 months following treatment, when compared to a wait-list control group. With this in mind, group therapy provides an avenue for clients to interact with others, which may help them identify maladaptive attitudes, beliefs, emotions, and behaviours that they possess. Not only does the client learn about the dynamics of their behaviour, the therapist is also able to observe how other group members respond to such behaviours. An additional advantage offered by group interventions is that estrangement from others may be reduced as traumatised individuals are encouraged to recount their experiences in a safe therapeutic setting with people who have encountered similar traumas (Foy, Erikson, & Trice, 2001). Group therapy provides an avenue for individuals to discuss PTSD symptoms in a non-threatening environment. It is expected to allow individuals to modify maladaptive assumptions that they hold about themselves and the world, and to develop greater insight and understanding of the meaning of their trauma experience(s).

The sample for this study consisted of military and paramilitary clients with PTSD attending an 8-week cognitive behavioural group therapy treatment course in a regional Australian city. The prevalence of PTSD among veterans returning from Vietnam, Iraq, Afghanistan, East Timor and other areas highlight the need for clinicians and the nation to improve the quality of treatment for those diagnosed with PTSD. Group therapy programs provide an accurate arena for reflecting on PTSD-related behaviour. Research has shown that sexual abuse survivors profit from the intimate sharing of the details of their abuse within group therapy (Goldsteinberg & Bутtenheim, 1993; Mennen & Meadow, 1993). In addition to this, reviews of controlled studies have demonstrated that approximately two-thirds of clients receiving group therapy show vast improvements in their symptomology (Lambert & Bergin, 1994; Luborsky et al., 1993).

The format of group therapy allows clients to realise that others have suffered similar experiences, and experience the same negative feelings of shame and guilt. Similarities with other people generally result in feelings of validation and acceptance from other group members (Goldsteinberg & Buttenheim, 1993). However, group therapy is only effective if a client feels as though they can share information about their internal life and still be accepted by others. It is important to note that clients may not be able to make sense of their experience if they feel too distressed within the group environment (Clark, 1993). This highlights the importance of examining observed distress levels of clients and the type of reactions received by confidants (the persons or group of people to whom the traumatised individuals disclose their trauma). Group therapy has the potential to provide individuals with a supportive environment where the impact of traumatic experiences can be normalised and validated by like-minded people (Foy, Eriksson, & Trice, 2001).

### **Significance of Study 3 and hypotheses to be tested**

Prior research has demonstrated that participants in similar PTSD programs reported significantly greater improvements in psychological health for up to 6 months after treatment, when compared to wait-list control participants (Ehlers, Clark, Hackmann, McManus, & Fennell, 2005). As the efficacy of group PTSD programs have already been established, the goal of the current study was to determine which factors are related to improvements following attendance at such a program. Specifically, the aim was to explore the applicability of aspects of the emotion processing theory of PTSD (Foa & Kozak, 1986) in understanding how resilience and disclosure are related to psychological symptoms, world assumptions, and quality of life in a clinical sample

of veterans attending a group PTSD treatment program. A scoring system for disclosure was devised in order to determine whether self-disclosure of traumatic experiences within a group environment was related to a person's recovery from PTSD. The suggestion that participation in trauma-related research may exacerbate symptoms (Bohannon, 1998) was considered at the onset of the study, however, empirical findings suggest the development of PTSD, or increased symptomology among individuals with PTSD, has not been related to participation in trauma-related research (Southwick, Morgan, & Rosenberg, 2000; Turnbull, McLeod, Callahan, & Kessler, 1988; Walker, Newman, Koss, & Bernstein, 1997). Research into the effects of major traumatic events is of importance to public administration, health policy, and clinical practice. Information gathered on the impact of traumatic experiences is expected to be useful for individuals and society in formulating preventive policies and deciding on appropriate models for intervention. It may also provide a basis for informing victims and other participants regarding how they might learn to work through distressing life experiences, such as trauma. Overall, it was expected that the results of this study would extend prevailing cognitive theories of PTSD and stimulate future empirical work on this topic.

The first goal of this study was to determine if psychological health, resilience, quality of life, and world assumptions were initially intercorrelated (replication of Study 1 and 2) and improved following participation in the 8 week PTSD program. If improvements in psychological health occurred, the next goal was to ascertain what may have led to such improvements. For example, was higher resilience at the start of the PTSD program related to better psychological health and quality of life at the end of the program? Or, did changes in resilience or disclosure contribute to positive health changes?



The specific predictions tested were:

**Hypothesis 1:** Participants who were more resilient (higher hardiness, social support, self-efficacy and self-deception) at the beginning of the study were also expected to be more psychologically healthy at intake, in terms of fewer psychological symptoms (HADS Anxiety, HADS Depression, AUDIT alcohol use, frequency of dissociation, severity of dissociation, and PCL PTSD symptoms), more positive assumptions about the self and world (WAS scores), and having higher quality of life (WHOQoL-BREF scores) at the start of the PTSD program.

**Hypothesis 2:** Participants with more positive beliefs about themselves and the world (higher WAS subscale scores) at intake to the PTSD program were expected to report significantly lower levels of psychological symptoms at completion of the PTSD program.

**Hypothesis 3:** Resilience (hardiness, self-efficacy, social support, and self-deception) was expected to significantly increase over the course of the 8-week treatment program.

**Hypothesis 4:** Psychological symptoms, world assumptions about the self and world, and quality of life scores were expected to improve over the treatment program.

**Hypothesis 5:** Higher resilience at intake and disclosure (greater length of disclosure, more positive reactions following disclosure, lower distress, and having fewer people present to compete with during trauma sessions) over the course of treatment were

expected to significantly predict fewer psychological symptoms and higher quality of life at the end of the 8-week PTSD treatment program.

**Hypothesis 6:** An increase in resilience from intake to the end of treatment, coupled with a greater level of disclosure over the course of the treatment, were expected to be significant predictors of improvement in psychological symptoms and quality of life from intake to the end of the PTSD program.

## CHAPTER 9

### Study 3: Method

A sample of Vietnam veterans and peacekeepers attending a nationally approved PTSD treatment program participated in this study. This study focused on traumatic disclosure within a group format, resilience, personal assumptions and worldviews, and PTSD-related symptoms. In order to examine the role that emotional disclosure plays in the recovery from emotional traumas, a disclosure checklist was established. The checklist was designed to record the level of emotionality experienced by participants while discussing their traumatic events, the level of organisation with which they were able to recall the order and time sequence of events, and the type of responses received from other members within the group or by the counsellor. Further to this, a battery of other assessment tools were utilised due to the multifaceted and complex presentation of PTSD. Assessment was conducted in the form of self-report questionnaires and a structured clinical interview.

#### Participants

The total sample (N = 65) consisted of 63 veterans (men = 61, women = 2) who had been deployed on military operations in Vietnam, Somalia, Rwanda, East Timor, Afghanistan, Iraq, or Namibia and two male members of the police force who were attending an 8-week posttraumatic stress disorder (PTSD) treatment program in regional North Queensland. The period of data collection lasted two years, during which time eight groups of 8 ( $\pm$  2) participants diagnosed with PTSD participated in the treatment program. The total pool of participants who could have participated was seventy one, however, six participants indicated at pre-test that they did not wish to participate in the

clinical research study. Thus the response rate for participation in this study was 91.55%, which can be considered high. Exclusion criteria for this study included a diagnosis of psychosis or extreme substance dependence as assessed by a trained psychiatrist. Most participants were receiving some form of a disability pension as a result of their PTSD symptoms and were formally diagnosed with PTSD several weeks prior to the commencement of the program. The PTSD diagnosis was made by a qualified psychiatrist who was also the clinical coordinator of the PTSD treatment program. The diagnosis was also verified with the use of the Clinicians Administered PTSD Scale (CAPS). The mean age of participants at intake to the program was  $43.61 \pm 1.51$  (range 22 to 68 years). Other demographic characteristics of participants (marital status, employment status, education level) at intake to the PTSD program are displayed in Table 17.

Table 17. *Demographic details and military service histories of participants' attending the PTSD program*

Variable name	Levels of variable	Frequency(f)	Percentage
Marital status	Single (never married)	7	10.8 %
	Married	41	63.1 %
	De-facto	8	12.3 %
	Separated, Divorced, or Widowed	9	13.8 %
Highest education attained	High school or lower	32	49.2 %
	Trade or tafe certificate	22	33.8 %
	University degree	11	16.9 %
Employment status	Working	35	53.8 %
	Not working (including looking for work)	30	46.2 %

*N* = 65

**Format of the PTSD program**

Participants attended the 8 week program for two consecutive days during the first two weeks of the program, for four consecutive days during the middle four weeks, and the program returned to two consecutive days a week for the final two weeks. Four 90-minute sessions occurred each day of the program. The first two weeks focussed on cognitive behavioural therapy (CBT) and psycho-educational training in the areas of stress, anxiety, depression, nutrition, and assertiveness. During the middle four weeks CBT techniques and psycho-education were utilised to address the areas of alcohol and substance abuse, anger management, pain management, and resilience training (forgiveness work and overcoming guilt feelings). Participants and their partners were also encouraged to attend group interpersonal skill sessions that focussed on self-awareness, communication, and conflict resolution.

Commencing in week four of the program, ten 90-minute group therapy sessions were devoted to work through traumatic experiences. Such sessions were facilitated by two clinical psychologists with extensive experience in the fields of stress, trauma, and exposure treatment. During these sessions, participants were educated on how traumatic experiences may shatter core assumptions and influence their thoughts, feelings, and behaviours. However the main aim of these sessions was to encourage participants to discuss and process how their traumatic experiences have affected them. Unlike the majority of other sessions conducted in this program, which were quite structured and focussed on planned issues, the trauma sessions were largely open-ended and allowed participants to determine the focus of sessions. Generally, participants attended recreational activities or engaged in artistic or creative pursuits (such as art therapy or music therapy) following trauma-related discussions.

The last two weeks consolidated material presented in preceding weeks and gave participants the opportunity to air any concerns about “life after the program”. Specific sessions that were conducted in these weeks included psycho-education on relapse prevention, planning after the program, and long-term maintenance of progress.

### **Standard measures employed**

A battery of questionnaires to assess factors related to mental health conditions are administered in the ongoing PTSD treatment program. The standard questionnaires typically administered during the PTSD program included: The PTSD Check List (PCL: Blanchard, Jones-Alexander, Buckley, & Forneris, 1996), The Clinician-Administered PTSD Scale (CAPS: Weathers, Ruscio, & Keane, 1999); The Dissociation measure (D. Forbes, personal communication, 2005); The Hospital Anxiety and Depression Scale (HADS: Zigmond & Snaith, 1983); The Alcohol Use Disorders Identification Test (AUDIT: Allen, Litten, Fertig, & Babor, 1997); and The World Health Organization Quality of Life Short Form (WHOQoL-BREF: WHOQOL, 1995). For the purposes of this study, participants were also given measures of beliefs (World Assumption Scale: WAS: Janoff-Bulman, 1989a), and resilience (The Cognitive Hardiness Subscale of the Stress Assessment Inventory (SAI): Nowack, 1990; The General Perceived Self-Efficacy Scale (GSE): Jerusalem & Schwarzer, 1992; Social Support Scale (SSS): Marshall & Barnett, 1993; Self-Deception Questionnaire (SDQ): Sackeim & Gur, 1979). As the psychometric properties for some of these measures have already been discussed at length in Study 1 and Study 2, only additional measures unique to Study 3 will be discussed herein. Refer to Appendix L for a copy of ethical approval and the additional materials employed in this study.

**Demographic information.** The age, gender, highest level of education currently attained (high school or lower, trade/tafe, or university degree), employment status (working, or not working), and marital status (single, married, de-facto, or separated/divorced) of participants were collected.

**Clinician-Administered PTSD Scale (CAPS).** The CAPS is a semi-structured interview that measures PTSD symptomatology as specified by the Diagnostic Statistical Manual-Fourth Edition (DSM-IV; Hyer, Summers, Boyd, Litaker, & Boudewyns, 1996). The CAPS was used in the current study to confirm a diagnosis of PTSD with regards to criteria specified by DSM-III-R (Blake et al., 1995). To increase the accuracy of responses, questions on the CAPS were followed by a series of probe questions that required participants to rate the frequency and severity of their PTSD symptoms (Blake et al., 1995). As the CAPS is a standardized interview, it maintains maximum consistency of results across different programs at the Mater PTSD Unit. The five-point-anchored options of the CAPS-frequency response scale included: 0 = Never, 1 = Once or twice , 2 = Once or twice a week, 3 = Several times a week, and 4 = Daily, or almost every day, whereas the five options on the CAPS-severity scale included: 0 = None, 1 = Mild, 2 = Moderate, 3 = Severe, and 4 = Extreme. According to Blanchard and colleagues (1996), individuals need to obtain a frequency score of one or higher and an intensity score of two or higher before assuming that a person meets the criteria for PTSD.

The CAPS has very high diagnostic proficiency and reliability when compared against the Structured Clinical Interview for DSM-III (Weathers, Ruscio, & Keane, 1999). Blake et al. (1990) reported that test-retest diagnostic reliability ranged from .90

to .98, and internal consistency was .94. When using the CAPS with combat veterans, Blake and colleagues (1995) further demonstrated that this scale had high reliability coefficients, good internal consistency, high test-retest reliability, and substantial convergent validity. A severity score (CAPS-Severity) was recorded for the purposes of the current study. This score (ranging from 0 to 136) was calculated by summing the product of the frequency (total number of PTSD symptoms reported in the past month) and intensity scores (the strength of PTSD symptoms) for each symptom (Blake et al., 1995).

#### **World Health Organization Quality of Life Short Form (WHOQoL-BREF).**

The WHOQoL-BREF is a 26-item self-report questionnaire that assesses participants' perceptions on the quality of their life (WHOQOL, 1995). The WHOQoL-BREF is based on the WHOQoL-100, which has been shown to have high test-retest reliability and criterion validity, with regards to convergent, discriminant, and predictive validity (Skevington & Wright, 2001). The WHOQoL-BREF contains 24 questions that focus on physical health, psychological health, social relationships, and the environment, whereas 2 questions produce scores for overall quality of life and general health (WHOQOL, 1995). Participants were asked to indicate whether questions applied to them: "not at all", "a small amount", "a moderate amount", "a great deal", or "an extreme amount". An example of some of the questions utilised in this scale include: "How safe do you feel in your daily life?" and "To what extent do you have the opportunity for leisure activities?" The Total WHOQoL-BREF, WHOQoL-BREF Physical health, WHOQoL-BREF Psychological health, and WHOQoL-BREF Social Relationships were examined in the current study. Higher scores are indicative of better psychological health.



**PTSD Checklist- Military Version (PCL-M).** The PCL-M is a 17-item self-report scale that corresponds to DSM-IV symptoms of PTSD (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). The PCL-M was specifically written for military traumatic experiences. Respondents were asked to rate each item from 0 = not at all to 5 = extremely to indicate the degree to which they have been negatively affected by symptoms (Forbes, Creamer, & Biddle, 2001). Questions asked participants to indicate how much they have experienced a problem, such as “repeated, disturbing memories, thoughts or images of a stressful military experiences”. There are two scoring procedures for the PCL-M. One way is to calculate a total severity score by summing all responses in the questionnaire. The alternative scoring protocol is to regard any responses between 3 and 5 as indicating symptomatic features of PTSD, whereas scores of 2 and lower are indicative of non-symptomatic responses. After making such classifications, it is recommended that the DSM-IV should be consulted to make an accurate diagnosis. Although it is suggested that researchers should combine both scoring methods (Forbes, Creamer, & Biddle, 2001) the current study only used the first procedure to obtain a total PCL-M severity score as this questionnaire is able to accurately determine whether a PTSD diagnosis is present. According to Weathers and Ford (1996), this scale has high test-retest reliability, internal consistency and convergent validity.

**Alcohol Use Disorders Identification Test (AUDIT).** The AUDIT is a self-report questionnaire designed to detect whether the alcohol consumption of individuals is putting them in jeopardy of developing alcohol-related disorders (Saunders, Aasland, Babor, de la Puente, & Grant, 1993). This scale consisted of 10 multiple-choice and

yes-no questions: 3 questions that assess quantity and frequency of alcohol use, 3 questions on harmful drinking, and 4 questions on hazardous drinking behaviours. Participants were asked to answer questions using a 5-point scale ranging from 0 (*never*) to 4 (daily or almost daily). Although scores on this 10-item scale ranged from 0 to 40, it has been suggested that scores of 8 or higher should be interpreted as indicative of hazardous or harmful patterns of alcohol consumption with alcohol-related difficulties (Conigrave, Hall, & Saunders, 1995). Empirical research has demonstrated that the AUDIT has high internal consistency (Allen, Litten, Fertig, & Babor, 1997; Barry & Fleming, 1993), high test-retest reliability (Daepfen, Yersin, Landry, Pecound, & Decrey, 2000), and convergent validity with related scales (Hays, Merz, & Nicholas, 1995). The AUDIT was found to have a test-retest reliability of .86 when used on a sample of non-hazardous alcohol consumers, alcoholics and cocaine abusers (Babor, De la Fuente, & Saunders, 1992).

**ACPMH Dissociation measure.** The Australian Centre for Posttraumatic Health (ACPMH) designed this test from the dissociation items included in the CAPS. These items were modified and operationalised into a shortened questionnaire that was given to a sample of Vietnam Veterans in order to assess the severity and frequency of reported dissociation (D. Forbes, personal communication, October 19, 2005). This measure assesses both the frequency and severity of dissociation, with responses yielding a score ranging from 0 (none, never or not at all) to 4 (most of the time, daily, or extreme). An example of an item from the frequency subscale is: 'How much of the time in the past month have you felt out of touch with things going on around you, like you were in a daze?'

**Disclosure checklist**

The disclosure checklist was developed for this study in order to record disclosure of trauma-related experiences within a group therapy format. In constructing this measure, several factors were taken into account. The main aim was to develop a valid indicator of the distress experienced by people with PTSD when they disclosed emotional information about their traumas in a therapeutic setting. This scale was also developed because at the time the study was undertaken, a relevant measure of the discussion of traumas within a group setting was not available. The disclosure checklist was completed by the researcher at the group sessions and included the following information.

**Length of disclosure.** The time (in minutes and seconds) that participants discussed trauma-related information was recorded. Participants were recorded discussing the following factors: 1) the experienced feelings, thoughts, physical sensations, and behaviours that occurred at the time of the trauma, 2) the experienced feelings, thoughts, physical sensations, and behaviours in the aftermath of the trauma, and 3) how they felt discussing their traumas in the group therapy setting. For the purposes of this study, *traumatic disclosure* was defined in accordance with the DSM-IV's definition. The DSM-IV identifies a traumatic event as one in which individuals experience actual or perceived threat of death, personal injury or serious injury to others. The time that participants engaged in emotional disclosure about issues such as violent death, ambushes in war, aircraft accidents, witnessing decapitations, and rotting bodies was also recorded. Traumatic disclosures were recorded during ten group trauma sessions lasting 90 minutes each ( $\pm$  five minutes). Trauma-related disclosure was only

recorded if participants spoke for greater than 15 seconds, as it was not feasible to accurately code information for shorter discussions. It was generally observed that people would discuss their traumas for minutes at a time, and therefore this chosen time period did not appear to exclude any discussions of trauma. Time was measured in minutes and seconds using a hand-held watch, and was rounded up to the nearest five seconds (for example, a disclosure lasting 43 seconds was rounded up to 45 seconds). Discussions of traumatic experiences for over 15 seconds were coded as described.

The same two clinicians were present in every trauma session, however, the number of clients in sessions differed minimally at times (for example, if a particular client was absent from the program, or the group consisted of fewer participants from the start of the program). Therefore some participants had potentially more time to discuss their traumatic experiences as fewer participants were present in sessions. As the number of participants competing for time to discuss their traumas was not identical, the researcher adjusted for this by controlling for the average number of session attendees for each participant in the regression analyses. From herein, “session attendees” will refer to the number of people attending sessions with the participants and will reflect their opportunity to speak. Higher scores were indicative of more participants within the group, and therefore fewer opportunities to disclose traumatic experiences. Lower scores were indicative of fewer people in the sessions and therefore there were greater opportunities to discuss traumatic experiences.

A continuous score was obtained in addition to a categorical score for the length of time participants disclosed. Thus, individuals were assigned to categories (Low, Medium, or High disclosure) based on the length of disclosure over all ten sessions that each participant was observed discussing trauma-related information. A common

approach to recoding continuous variables into categories is to divide the measure by percentiles, such as quartiles (Browner, 2006). In accordance with the percentile cut-off procedure utilised by Church and colleagues (2002), disclosure categories were based on the bottom 25<sup>th</sup> percentile, 25<sup>th</sup> to 75<sup>th</sup> percentile, and the top 75<sup>th</sup> percentile of scores. More specifically, Low Disclosers were in the bottom quartile (25<sup>th</sup> percentile or less), Medium Disclosers fell between the interquartile range (25<sup>th</sup> to 75<sup>th</sup> percentile), and High Disclosers were in the top quartile (75<sup>th</sup> percentile or higher) for length of time discussing trauma-related experiences.

**Observed distress.** The emotional impact of discussing feelings and thoughts related to one's traumatic experiences was also recorded in the disclosure checklist. As people with PTSD typically avoid discussing information about their traumatic experiences (Kolb, 1989; McFarlane, 1989a; Scurfield 1993), this seems to imply that trauma-related disclosure leads to or exacerbates distress levels. An aim of this study was to determine if observed distress during trauma-related disclosure was related to reported changes in psychological symptoms. Pennebaker (1993) suggested that short-term distress is positively related to improved outcomes in the long-term. This view is in accordance with proponents of emotion processing theory who state that feared trauma memories must be activated in order to overcome feared responses (Foa & Rothbaum, 1998). As an available measure did not exist, a coding scheme was developed to provide a comprehensive record of observed distress using an exhaustive set of mutually exclusive codes. To devise this measure, the researcher attended several trauma sessions at the PTSD program (prior to data collection) and recorded the types of behaviours displayed by participants during trauma-related disclosure in order to

develop a list of relevant behaviour codes. Previous research confirmed that the resulting indicators were useful and accurate behaviours to examine when exploring distress (Herron, 2001). Table 18 lists the behaviour codes, and their operational definitions, that were utilised to measure observed distress.

During the study, the researcher observed and recorded whether client's displayed any of the abovementioned behavioural indicators of distress as they discussed their traumatic experiences. The maximum distress score that a client could obtain per disclosure was 12 (if each of the behaviour codes in Table 18 were observed at least once during a particular trauma-related disclosure). The total number of distress indicators observed over the ten trauma sessions were calculated as a measure of observed distress. The higher the score, the more distress behaviours the participant expressed while disclosing information about their trauma. As distress levels were only recorded while participants discussed their traumas, the average number of session attendees were controlled in subsequent regression analyses.

**Confidants' reactions to disclosure.** Reactions made by counsellors or other members of the PTSD group when a person discussed trauma-related information were also recorded. Evidence suggests that the reactions of confidants play a role in whether one benefits from trauma disclosure. In the current study, responses of the counsellors or group members were observed each time a participant discussed their traumatic experiences (for greater than 15 seconds). Table 19 indicates how reactions were categorised into positive or negative responses.

Table 18. *Operational definitions of behaviours indicative of observed distress*

Behaviour	Definition
Crying	<ul style="list-style-type: none"> <li>- Audible crying</li> <li>- Falling tears</li> </ul>
Teary/Glazed eyes	<ul style="list-style-type: none"> <li>- ‘Welling up of tears’</li> <li>- Sniffling (not due to a cold)</li> <li>- Rubbing of eyes</li> </ul>
Voice changes	<ul style="list-style-type: none"> <li>- Changes in tone, speed, or loudness of voice</li> </ul>
Shaking/Trembling	<ul style="list-style-type: none"> <li>- Clear movements of limbs</li> </ul>
Sweating	<ul style="list-style-type: none"> <li>- Perspiration of the brow or body</li> <li>- Client indicates feeling hot when temperature is comfortable</li> </ul>
Anger outbursts	<ul style="list-style-type: none"> <li>- Verbal and physical outbursts</li> <li>- ‘Huffing and puffing’</li> <li>- Leaving the room in anger</li> <li>- Aggressive hand gestures</li> <li>- Clenched fist</li> <li>- Clenched jaw</li> <li>- Excess swearing</li> <li>- Finger pointing</li> <li>- Beady eyes</li> </ul>
Breathing changes	<ul style="list-style-type: none"> <li>- Deepening of breathing</li> <li>- Breathing is tight or restricted</li> <li>- Shallow breathing</li> </ul>
Eyes cast down	
Slumped shoulders	
Crossed arms	
Sitting on the edge of the seat	
Rigid posture	

Table 19. *Descriptions of how reactions from clients and counsellors were categorised*

Category	Description
<b>Negative</b>	
Negative responses	<ul style="list-style-type: none"> <li>- Negative feedback or oppositional statements from others</li> <li>- For example: “No... that’s wrong... you should have done this instead” or “I experienced the same thing and I’m ok, why aren’t you?”</li> </ul>
Ignored	<ul style="list-style-type: none"> <li>- Inattentive clients or counsellor</li> <li>- For example: People ‘flicking’ through their booklets or talking among one another as someone is disclosing their traumas</li> </ul>
<b>Positive</b>	
Empathy/support	<ul style="list-style-type: none"> <li>- Positive feedback from others</li> <li>- For example: congratulating someone for sharing their experiences, telling someone how brave they are, shaking someone’s hand or giving them a hug.</li> <li>- Identifying the hardship experienced by the client</li> </ul>
Education/technique	<ul style="list-style-type: none"> <li>- Psychological techniques that may be helpful in alleviating or dealing with negative feelings</li> <li>- Techniques may include relaxation exercises, deep breathings, self-monitoring exercises, cognitive-behavioural techniques and so forth.</li> <li>- Useful information or knowledge related to another’s trauma. For example: something someone learned from their own experiences or through personal counselling.</li> </ul>

It was not possible to video record the trauma sessions as the team members and ethics committee for the PTSD program felt that this might hinder the benefits of group therapy. Because of the difficulty of coding everyone’s behaviour at once, the researcher coded whether a person received positive or negative reactions from any client or counsellor. Generally, only one person would comment after someone



discussed their traumas so this appeared to be an appropriate way to measure this variable. One point was given for the occurrence of each category of positive or negative reactions. At a maximum, participants could receive four points for positive responses (2 for empathy/support, 2 for education/technique) and four points for negative responses (2 for negative responses, 2 for ignored) each time they discussed their traumatic experiences. Table 20 shows how such responses were recorded

Table 20. *Recording confidants' reactions to disclosure*

Client	Time	Positive	Negative
		Clients	Clients
		___ Empathy/support	___ Negative responses
		___ Education or technique	___ Ignored
		Clinician	Clinician
		___ Empathy/support	___ Negative responses
		___ Education or technique	___ Ignored

In order to explore the overall impact of group reactions on an individual engaging in traumatic self-disclosure, an overall confidants' reaction score was derived by subtracting the total number of negative responses received across the ten trauma sessions from the total number of positive response over the ten trauma sessions. This score was averaged by dividing the number of times that the participant engaged in discussions relating to their traumas.

$$\text{Confidants' Reactions to Disclosure} = \frac{\text{Total positive responses minus total negative responses}}{\text{Number of times that participant disclosed}}$$

Higher values on this measure were indicative of more positive reactions from confidants' while discussing traumatic experiences in the group therapy format. Lower scores indicated that participants tended to receive more negative responses from others while engaging in trauma-related discussions.

### **Interrater reliability of disclosure measures**

Bivariate correlations between scores recorded by two different raters were employed to assess the interrater reliability of the disclosure checklist prior to data collection. A score of .85 or above was considered an acceptable interrater reliability score. Raters were given detailed written explanations of how to record the different facets of disclosure of interest in this study. Raters also met with the researcher for 60 to 90 minutes and discussed the rating system further. Interrater reliability was first conducted with two trained raters who were asked to observe a video entitled "Without Consent". During this 90-minute video, eighteen individuals discussed their experiences of traumatic events, which were predominantly cases of sexual assault or sexual violence. High levels of interrater reliability were observed for all of the disclosure variables: length of disclosure ( $r(17) = .99, p = 0.0005$ ), observed distress ( $r(17) = .99, p = 0.0005$ ), and overall confidants' reactions to disclosure ( $r(17) = 1.00, p = 0.0005$ ).

Subsequent to this, six participants attending the PTSD group therapy program gave written consent to be filmed while discussing their traumatic experiences. All participants had acquired a diagnosis of PTSD as a result of traumatic experiences that

occurred throughout military deployments. After having several meetings with members of the PTSD program, it was agreed that video footage would be a more appropriate way to assess the interrater reliability of the disclosure checklist rather than having additional people attending the actual group trauma sessions. In accordance with trauma sessions held throughout the PTSD program, a 90 minute session was scheduled for these participants with a trained clinical psychologist who had extensive experience in the field of stress and trauma. After asking twenty participants, only six agreed to be filmed for research purposes which were similar to the number of participants that generally attend the PTSD program at a time (typically  $8 \pm 2$  participants). Five of these participants discussed their traumatic experiences during the allotted time period. The participants were informed that two colleagues from the PTSD program would observe the video and may use information derived from the footage in a PhD thesis. The researcher and members of the PTSD program set aside time with participants to discuss any consequence that arose as a result of this study, however no additional distress was reported as a result of having their experience video taped. Bivariate correlations were conducted and showed that all measures of disclosure were consistent between raters: length of disclosure ( $r(5) = .98, p = .004$ ), observed distress ( $r(5) = .96, p = .011$ ), and overall confidants' reactions to disclosure ( $r(5) = .93, p = 0.021$ ).

From these interrater reliability tests, it was surmised that the coding system developed was reasonably unambiguous and capable of producing a consistent measure of the length of disclosure, observed distress levels while discussing traumas, and the type of reactions that participants received from others following trauma-related disclosure.

## **Procedure**

Participants were informed that the study consisted of two parts that would be carried out at specific times during the PTSD treatment program. They were not aware that the study's aim was to assess improvements from pre-test to post-test.

**Pre-test instructions.** An assessment process occurred approximately one month prior to the commencement of the PTSD program where participants were assessed by a clinical psychiatrist to determine whether all criteria were met for a diagnosis of PTSD. Participants were also administered the CAPS by a trained clinical psychologist to further determine their suitability to the program. Once the suitability of participants was assessed, participants were informed that they could attend the 8-week treatment program. On the first day of the program, participants received an information sheet explaining the aims of the research study and were given a consent form (refer to Appendix N). The researcher explained issues concerning the confidentiality of the data collected and the purpose of the questionnaires. Participants were informed of their right to withdraw from the study at any time, and that they could refuse consent for the collected information to be used for any purpose beyond monitoring their progress throughout the PTSD program. After signing the informed consent form, a battery of questionnaires was administered under relaxed conditions and the investigator answered queries as required. Participants were given adequate time to quietly complete the questions at their own pace, which generally lasted sixty to ninety minutes.

**Post-test instructions.** On the final day of the 8-week PTSD treatment program, participants were asked to complete another battery of questionnaires (the same

measures from the pre-test). The researcher considered conducting the post-test three months after the program when the clients met for their follow-up with the PTSD program. However, as earlier records from the PTSD program indicated that many clients did not return for their follow-up, it was decided that post-tests were to be conducted on the final day of the program to avoid attrition. This occurred two weeks after the last trauma session, which was believed to be sufficient time for the clients to process their trauma-related discussions. After all participants had completed the questionnaires, the true nature of the study was explained and each participant received a debriefing sheet (refer to Appendix O). Participants were informed that participation in this study was expected to help other veterans and paramilitary service people diagnosed with PTSD, as results were expected to shed light on ways to improve the delivery of services to this clientele.

### **Power analysis and considerations regarding sample size**

Bolton and colleagues (2003) found that peacekeepers who received positive responses from others following deployments in Somalia reported significantly lower PTSD symptoms than those who received negative responses from other people or did not discuss their experiences in Somalia with anyone ( $d = .61$  and  $.55$ , respectively), which is equivalent to a medium effect size. A study by Creamer and colleagues (2006) showed positive treatment effects of a group-based PTSD program conducted in Australia that was accredited by the same organisation as the program used in the current study (The Australian Centre for Posttraumatic Mental Health). The effect sizes from intake to the 24-month follow up period were  $d = .85$  for PCL PTSD symptoms,  $d$

= .70 for HADS Anxiety symptoms,  $d = .56$  for HADS Depression symptoms, and  $d = .35$  for AUDIT alcohol use scores. Thus the average effect size was  $d = .62$ .

The required sample size was calculated using G\*Power (Faul & Erdfelder, 1992) with effect sizes based on the scores of Creamer et al.'s (2006) and Bolton et al.'s (2003) studies. For the primary analysis (Correlations), 64 participants were needed to detect a medium effect size ( $r = .30$ ) at .80 power level. For the subsequent regression analyses, 103 participants would be needed to detect a medium effect size ( $f^2 = .17$ ) at .80 power for seven predictors, whereas a minimum sample of 77 participants would be required to detect a medium effect at .70 power.

Based on the power analysis, the optimal sample size for this study was 77-103 participants. This was approximated, but not achieved, however, as testing was discontinued earlier than initially planned when a new program coordinator was appointed to the PTSD program and new staff members began facilitating the trauma counselling sessions. In addition, the researcher was no longer able to attend the trauma sessions due to reassignment to different sessions within the PTSD program. Another factor which led the researcher to an earlier than expected halt to data collection was that two new staff members with less clinical experience than the previous clinicians took over facilitation of the group trauma sessions. The less than optimal sample size should be taken into account when interpreting results from regression analyses.

## CHAPTER 10

### Study 3: Results and Discussion

#### Data screening

Before undertaking statistical analyses, the data set was screened for missing data, accuracy of entered responses, and violations of assumptions. Kurtosis and skewness were examined for all continuous variables at intake and discharge. Results demonstrated that the majority of variables did not exceed acceptable kurtosis (-3 to +3) and skewness levels (-2 to +2), which suggests that the distributions can be considered normal. However, kurtosis scores were above the accepted level suggested by Hutcheson and Sofronion (1999) for CAPS Severity scores for PTSD symptoms. These variables were asymmetrically positively skewed and peaked (leptokurtic), which was expected considering the sample consisted of a group of people diagnosed with PTSD who were engaging in a treatment program to improve their symptoms. The Kolmogorov-Smirnov test found that some measures were not normally distributed (refer to Appendix P). Demographic variables and all psychological measures were screened for incorrect data entries and missing data. One client was unable to be contacted to complete a segment of the study, which resulted in missing data for several variables (refer to Appendix Q). To compensate for this, a mean substitution was used for missing data in accordance with suggestions by Tabachnick and Fidell (2001). That is, means were calculated from available data and used to replace missing values for this participant.

Before conducting the MANOVAs, the assumptions of equal cell size, univariate normality, multivariate normality, equality of variance-covariance matrices, linearity, multicollinearity, singularity and homogeneity of variance were examined. Assumptions

of normality, homogeneity of variance, random selection, and sphericity were examined for ANOVAs. Likewise, the assumptions of an adequate sample size, multicollinearity, normality, linearity, homoscedasticity, and outliers were examined for each regression analysis. Violations of assumptions are reported in the relevant section.

### **Preliminary transformations and relationships among demographic and outcome variables**

Prior to analysing the data, difference scores were calculated for several measures. Difference scores were calculated by subtracting the pre-test score (collected at the start of the PTSD treatment program) from the post-test score (collected 8-weeks after commencing the PTSD treatment program) for each measure. Negative difference scores were indicative of decreased scores at the end of the PTSD program and positive difference scores were indicative of increased scores at the completion of the program.

To determine if demographic covariates needed to be considered in subsequent inferential analyses, several bivariate correlations, one-way ANOVAs, and *t* tests were conducted to determine if psychological symptoms, world assumptions, and quality of life measures were significantly related to age, the level of education attained by participants, employment status, and marital status. Gender differences were not examined as only two of the sixty-five participants were female. One-way ANOVAs showed that marital status (single, married, de-facto, or separated/divorced) was not a significant factor for psychological symptoms, world assumptions, or quality of life measures.

Results showed that older participants reported significantly higher WAS Benevolence of the World scores at intake to the program ( $r(65) = .32, p = .009$ ) and at



the end of the program ( $r(65) = .29, p = .021$ ). Older participants also had significantly lower observed distress ( $r(65) = -.25, p = .05$ ), were higher self-deceivers ( $r(65) = .26, p = .037$ ), and reported significantly higher WAS Benevolence of People scores at the end of the program ( $r(65) = .36, p = .004$ ). When examining changes in scores from intake to the end of the PTSD program (difference scores), it was found that younger participants reported higher consumption of alcohol ( $r(65) = -.28, p = .024$ ), higher WAS Benevolence of People beliefs ( $r(65) = .25, p = .049$ ), higher WAS Self-Worth beliefs ( $r(65) = -.28, p = .024$ ) and higher WHOQoL-BREF Psychological health ( $r(65) = .25, p = .040$ ).

A further ANOVA showed that HADS Anxiety scores at intake to the program was significantly different depending on the education levels of participants, with significantly higher anxiety levels among university graduates ( $16.82 \pm 3.06$ ) when compared to those whose highest level of education was high school ( $13.78 \pm 3.28$ ),  $F(2,62) = 4.32, p = .017$ . Further to this, WAS Justice scores at post-test were found to be significantly higher among those who had attained a trade or tafe certificate ( $13.74 \pm 2.52$ ) relative to those whose highest education level was high school ( $11.28 \pm 3.86$ ),  $F(2,62) = 3.61, p = .033$ .

With regards to employment status, currently employed workers ( $82.03 \pm 10.55$ ) were found to have significantly higher self-deception scores at intake to the program relative to non-employed people ( $75.23 \pm 14.11$ ),  $t(63) = 2.22, p = .03$ . Overall quality of life scores (WHOQoL-BREF) at intake were significantly higher among employed workers ( $200.12 \pm 67.90$ ) relative to non-employed people ( $167.60 \pm 57.46$ ),  $t(63) = 2.07, p = .043$ . Employed workers also reported significantly higher WHOQoL-BREF Physical health scores ( $40.86 \pm 14.34$ ) at intake to the program when compared to non-

employed people ( $31.07 \pm 13.84$ ),  $t(63) = 2.70$ ,  $p = .009$ . Significant demographic correlates of outcome measures were controlled in subsequent tests as indicated.

### **The relationships among resilience at intake and concurrent psychological symptoms, world assumptions, and quality of life**

To test the first hypothesis, Pearson product-moment correlations were conducted between resilience measures at intake and concurrent psychological symptoms (AUDIT alcohol use, PCL PTSD symptoms, HADS Anxiety, HADS Depression, frequency of dissociation, and severity of dissociation), quality of life measures (WHOQoL-BREF), and World Assumption Scale (WAS) scores. This analysis was conducted to replicate Study 1, in examining whether participants who were more resilient at the beginning of the study were also more psychologically healthy at intake as well. Table 21 shows that high levels of hardiness, self-efficacy, social support, and self-deception at the start of the program were generally related to fewer psychological symptoms at intake. A significant relationship between severity of dissociation and the resilience factors of hardiness and social support was not observed. In addition, high self-deception at intake to the course was related to lower concurrent PTSD symptoms, but this relationship was not statistically significant. Alcohol use at the start of the program was not significantly related to any of the resilience factors. With regards to quality of life, higher levels of hardiness and self-efficacy at the start of the PTSD program were significantly related to higher quality of life scores on all domains at intake. In addition, participants who entered the program with higher social support and self-deception reported significantly higher overall quality of life and higher quality of social relationships.

Table 21. Zero-order correlations among resilience, quality of life, and psychological symptoms at intake to the program

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<i>Resilience measures</i>														
1. Hardiness	1.00													
2. Self-efficacy	.69***	1.00												
3. Social support	.57***	.36**	1.00											
4. Self-deception	.41**	.45***	.24†	1.00										
<i>WHOQoL-BREF measures</i>														
5. Physical health	.32*	.42***	.08	.21	1.00									
6. Psychological health	.36**	.46***	.18	.22	.70***	1.00								
7. Social relationships	.56***	.41**	.53***	.42***	.34**	.47***	1.00							
8. Total WHOQoL-BREF	.53***	.56***	.37**	.35**	.80***	.81***	.71***	1.00						
<i>Psychological symptoms</i>														
9. PCL PTSD symptoms	-.37**	-.39**	-.32*	-.22†	-.49***	-.52***	-.41**	-.58***	1.00					
10. HADS Anxiety	-.39**	-.47***	-.26*	-.41**	-.43***	-.54***	-.54***	-.65***	.71***	1.00				
11. HADS Depression	-.51***	-.57***	-.30*	-.26*	-.65***	-.72***	-.50***	-.78***	.65***	.55***	1.00			
12. Frequency of dissociation	-.25*	-.36**	-.30*	-.47***	-.36**	-.33*	-.31*	-.46***	.55***	.55***	.43***	1.00		
13. Severity of dissociation	-.16	-.30*	-.18	-.43***	-.29*	-.20	-.20	-.37**	.50***	.51***	.33*	.92***	1.00	
14. AUDIT alcohol use	-.06	-.12	.009	.04	-.12	-.03	.02	-.05	.17	.07	.08	.08	.10	1.00

\* Correlation is significant at or below the 0.05 level (2-tailed), \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ ). N = 65

Table 22 shows that participants with higher resilience at intake to the program reported significantly more positive world assumptions when they began the PTSD program. These results corroborate the findings of the first study. In particular, participants reported more positive beliefs regarding self-controllability, luck, and self-worth if they had higher resilience at intake. Higher resilience on all measures at intake (except self-deception) were significantly related to the belief that outcomes are controllable. Participants viewed other people as benevolent if they had higher levels of hardiness and social support at intake to the program. The world was viewed as more benevolent if people began the PTSD program with greater levels of social support.

#### **Relationships among pre-test subscale scores on the World Assumption Scale and post-test psychological symptoms**

Bivariate correlations were conducted to explore whether positive beliefs about the self and world (World Assumption Scale [WAS] subscale scores) at intake to the PTSD program were significantly associated with fewer reported psychological symptoms at completion of the PTSD program (Hypothesis 2). As can be seen in Table 23, participants who entered the program with higher justice beliefs had significantly lower levels of HADS anxiety, HADS depression, frequency of dissociation, and severity of dissociation at completion of the program. Those who held high beliefs in the randomness of events at intake to the program reported significantly lower HADS anxiety and HADS depression at completion of the program. Those who reported lower PCL PTSD symptoms, HADS anxiety, HADS depression, frequency of dissociation, and severity of dissociation at the end of treatment began the program with higher levels of self-worth and had greater feelings of self-controllability.

Table 22. Zero-order correlations among measures of resilience and world assumptions at intake to the PTSD program

	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Resilience measures</i>													
1. Hardiness	1.00												
2. Self-efficacy	.69***	1.00											
3. Social support	.57***	.36**	1.00										
4. Self-deception	.41**	.45***	.24†	1.00									
<i>WAS measures</i>													
5. Justice	.20	.12	.13	.24†	1.00								
6. Benevolence of People	.32*	.02	.41**	.08	.17	1.00							
7. Randomness	-.03	-.05	.01	.001	.40**	.09	1.00						
8. Benevolence of the World	.16	.09	.36**	.07	.16	.64***	.03	1.00					
9. Self-Worth	.66***	.69***	.44***	.54***	.25*	.19	-.06	.17	1.00				
10. Luck	.64***	.53***	.53***	.34**	.18	.26*	.19	.10	.60***	1.00			
11. Controllability	.40**	.39**	.37**	.18	.35**	.18	.18	.14	.36**	.46***	1.00		
12. Self-Controllability	.35**	.42**	.40**	.41**	.20	.003	.11	.04	.44***	.41**	.40**	1.00	
13. Total WAS scores	.61***	.53***	.59***	.43***	.55***	.53***	.36**	.53***	.68***	.69***	.68***	.53***	1.00

\* Correlation is significant at or below the 0.05 level (2-tailed), \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ ). N = 65

Table 23. Relationship among WAS subscale scores at intake and psychological symptoms at the end of the PTSD program

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<i>Post-test psychological symptoms</i>														
1. AUDIT alcohol use	1.00													
2. PCL PTSD symptoms	.19	1.00												
3. HADS Anxiety	.17	.78***	1.00											
4. HADS Depression	.17	.72***	.71***	1.00										
5. Frequency of dissociation	.24†	.67***	.67***	.52***	1.00									
6. Severity of dissociation	.22†	.57***	.60***	.45***	.91***	1.00								
<i>Pre-test WAS subscales</i>														
7. Justice	.03	-.14	-.29*	-.30*	-.25*	-.27*	1.00							
8. Benevolence of People	.07	-.06	-.009	-.17	-.23†	-.21	.17	1.00						
9. Randomness	.14	-.20	-.25*	-.26*	-.13	-.18	.40**	.09	1.00					
10. Benevolence of the world	-.14	-.02	-.08	-.12	-.19	-.14	.16	.64***	.03	1.00				
11. Self-Worth	.02	-.32**	-.46***	-.42***	-.40**	-.40**	.25*	.19	-.06	.17	1.00			
1. Luck	.12	-.49***	-.44***	-.56***	-.24†	-.17	.18	.26*	.19	.10	.60***	1.00		
14. Controllability	-.31*	-.22	-.35**	-.36**	-.23†	-.21	.35**	.18	.18	.14	.36**	.46***	1.00	
15. Self-Controllability	-.12	-.33**	-.43***	-.39**	-.33*	-.36**	.20	.003	.11	.04	.44***	.41**	.40**	1.00

\* Correlation is significant at or below the 0.05 level (2-tailed), \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

† = trend towards significance ( $p > .05$  but  $< .07$ )

N = 65

Feeling ‘luckier’ than others at the start of the treatment program was associated with lower levels of PCL PTSD symptoms, HADS anxiety, and HADS depression at the end of the 8-week course. Furthermore, participants reported lower AUDIT alcohol use, HADS anxiety, and HADS depression at the end of the program if they believed at the start of the course that events were controllable.

Standard multiple regression analyses were conducted to determine which pre-test WAS subscale scores were the best predictors of fewer psychological symptoms at the end of the PTSD program. The predictors were pre-test WAS subscale scores (Justice, Benevolence of People, Randomness, Benevolence of the World, Self-Worth, Luck, Controllability, and Self-Controllability). The dependent variables were the post-test scores for each of the psychological symptom measures (post-test HADS Anxiety, HADS Depression, PTSD symptoms, AUDIT alcohol use, frequency of dissociation, and severity of dissociation). Age, education level, and employment status were not controlled in these analyses as psychological health measures were not significantly related to any demographic variable.

All variables met the assumptions of linearity, homoscedasticity, and independence of residuals. Multicollinearity was met for all but two variables (Self-Worth and Luck). Specifically, the critical Mahalanobis distance value for eight independent variables at alpha .001 ( $X^2$  critical = 20.09) was violated by one case for each dependent variable. However, as this outlier was only marginally higher than the critical value and did not exceed the maximum value for Cook’s Distance (Tabacknick & Fidell, 2001, pg. 69), the case was included in the analyses. Tolerance values were above .2 and the average VIF in each analysis was well below 10, therefore according to Pallant’s (2005) recommendations, multicollinearity was not a concern.

**WAS and AUDIT alcohol use scores.** Table 24 presents the results of the standard regression analysis for post-test AUDIT alcohol use scores. Results showed that WAS scores at the start of the PTSD program predicted 12.7% of the variance in AUDIT alcohol use at the end of the PTSD program, Multiple  $R = .49$ ,  $F(8,56) = 2.16$ ,  $p = .044$ . Further investigation revealed that pre-test controllability and self-controllability scores made unique and statistically significant contributions to the prediction of AUDIT alcohol use at the end of the PTSD program. Specifically, results suggested that veterans consumed less alcohol at the end of the program if they had higher self-controllability beliefs and lower controllability beliefs at intake. Therefore, alcohol consumption was lower at the end of the program if participants entered the course feeling as though they often did the ‘right thing’ and engaged in precautionary behaviours (high Self-Controllability) and if they began the course believing that people have little control over their outcomes (low Controllability).

**WAS and PCL PTSD symptoms.** Table 25 presents the results of the standard regression analysis for post-test PCL PTSD symptoms. Results showed that WAS scores at the start of the PTSD program predicted 17.2% of the variance in PCL PTSD symptoms at the end of the PTSD program, Multiple  $R = .53$ ,  $F(8,56) = 2.66$ ,  $p = .015$ . Further investigation revealed that the pre-test luck score was the only variable to make a significant unique contribution in the prediction of PCL PTSD symptoms at the end of the PTSD program. Thus, results suggested that participants who felt ‘luckier’ at the start of the 8-week treatment program tended to have fewer PTSD symptoms by the end of the course.



Table 24. *Alcohol use at the end of the PTSD program as predicted by world assumptions at intake*

	B	SE B	$\beta$
Justice	-.33	.428	-.11
Benevolence of people	.46	.41	.18
Randomness	.38	.40	.13
Benevolence of the world	-.71	.37	-.30†
Self-Worth	.11	.39	.05
Luck	-.01	.37	-.008
Controllability	1.14	.37	.44**
Self-Controllability	-.88	.43	-.29*

Note  $R^2 = .24$  ( $ps < .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ )

Table 25. *PTSD symptoms at the end of the treatment program as predicted by initial world assumption scores*

	B	SE B	$\beta$
Justice	-.03	.55	-.01
Benevolence of people	.24	.52	.07
Randomness	-.47	.50	-.12
Benevolence of the world	-.05	.47	-.01
Self-Worth	-.13	.49	-.04
Luck	-1.24	.48	-.42*
Controllability	.20	.47	.06
Self-Controllability	-.58	.54	-.14

Note  $R^2 = .28$  ( $ps < .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ )

**WAS and HADS Anxiety scores.** As displayed in Table 26, results of a standard regression analysis showed that WAS scores at the start of the PTSD program accounted for 28.3% of the variance in HADS Anxiety scores at the end of the PTSD program, Multiple  $R = .61$ ,  $F(8,56) = 4.15$ ,  $p = .001$ . Further investigation revealed a

trend that pre-test self-worth scores predicted HADS Anxiety scores at the end of the PTSD program. Results suggested that individuals tended to report fewer anxiety symptoms at the end of the program if they had higher degrees of self-worth when they entered the PTSD program.

Table 26. *Anxiety levels at the end of the PTSD program as predicted by initial world assumption scores*

	B	SE B	$\beta$
Justice	-.08	.15	-.07
Benevolence of people	.20	.14	.19
Randomness	-.22	.14	-.19
Benevolence of the world	-.10	.13	-.11
Self-Worth	-.25	.14	-.27†
Luck	-.15	.13	-.17
Controllability	-.07	.13	-.06
Self-Controllability	-.21	.15	-.17

Note  $R^2 = .37$  ( $ps < .005$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ )

**WAS and HADS Depression scores.** Table 27 presents the results of the standard regression analysis for post-test HADS Depression scores. Results showed that WAS scores at the start of the PTSD program predicted 30.3% of the variance in HADS Depression scores at the end of the PTSD program, Multiple  $R = .63$ ,  $F(8,56) = 4.48$ ,  $p = .0005$ . Further investigation revealed that pre-test luck scores significantly explained the variance in HADS Depression scores at the end of the PTSD program. This meant that participants who felt ‘luckier’ at the start of the 8-week treatment program tended to have less depression by the end of the course.

Table 27. *Depression scores at the end of the PTSD program as predicted by world assumptions at the start of the program*

	B	SE B	$\beta$
Justice	-.14	.16	-.11
Benevolence of people	.006	.16	.005
Randomness	-.16	.15	-.13
Benevolence of the world	-.04	.14	-.04
Self-Worth	-.10	.15	-.10
Luck	-.37	.14	-.38*
Controllability	-.04	.14	-.03
Self-Controllability	-.19	.16	-.14

Note  $R^2 = .39$  ( $p_s < .0005$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ )

**WAS and Frequency of dissociation.** As shown in Table 28, WAS scores at the start of the PTSD program predicted 13.2% of the variance in frequency of dissociation scores at the end of the PTSD program, Multiple  $R = .49$ ,  $F(8,56) = 2.21$ ,  $p = .040$ . Further investigation revealed that pre-test self-worth scores made a significant unique contribution to the prediction of frequency of dissociation scores at the end of the PTSD program. Thus, results suggested that individuals reported fewer dissociative symptoms at the end of the program if they had higher self-worth at the start of the PTSD treatment program.

**WAS and Severity of Dissociation.** The result of a standard regression analysis for post-test severity of dissociation scores is displayed in Table 29. Results showed that WAS scores at the start of the PTSD program predicted 20.5% of the variance in severity of dissociation scores at the end of the PTSD program, Multiple  $R = .55$ ,  $F(8,56) = 3.06$ ,  $p = .006$ . Further investigation revealed that self-worth scores made a

significant unique contribution in the prediction of severity of dissociation scores at the end of the PTSD program. Specifically, results indicated that individuals tended to report less severe dissociative symptoms at the end of the program if they had higher self-worth at the start of the PTSD treatment program.

Table 28. *Frequency of dissociation at the end of the PTSD program as predicted by initial world assumption scores*

	B	SE B	$\beta$
Justice	-.09	.19	-.06
Benevolence of people	-.18	.18	-.16
Randomness	-.14	.17	-.11
Benevolence of the world	-.02	.16	-.02
Self-Worth	-.35	.17	-.34*
Luck	.13	.17	.13
Controllability	-.02	.16	-.02
Self-Controllability	-.26	.19	-.19

Note  $R^2 = .24$  ( $ps < .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ )

Table 29. *Severity of dissociation at the end of the PTSD program as predicted by world assumption scores at intake to the program*

	B	SE B	$\beta$
Justice	-.08	.17	-.06
Benevolence of people	-.25	.17	-.23
Randomness	-.24	.16	-.19
Benevolence of the world	.08	.15	.08
Self-Worth	-.44	.16	-.43*
Luck	.28	.15	.29†
Controllability	-.33	.17	-.25
Self-Controllability	-.33	.17	-.25†

Note  $R^2 = .30$  ( $ps < .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ )

### **Did resilience, world assumptions, quality of life, and psychological health improve over the treatment program?**

A series of analyses were conducted to determine if resilience, quality of life, world assumptions, and the psychological health of participants improved following participation in a PTSD treatment program (Hypothesis 3 and Hypothesis 4). In addition to testing hypotheses unique to this thesis, confirmation of the established efficacy of the program was sought. Hypothesis 3 stated that resilience would significantly increase over the course of the 8-week treatment program. A doubly multivariate ANOVA revealed that although all measures of resilience changed in the predicted direction, the overall difference was not significantly different,  $F(4,61) = 1.58, p = 0.19$ , partial  $\eta^2 = .09$ . However, univariate tests revealed that hardiness significantly increased from pre-test to post-test (refer to Table 30).

Table 30. *Changes in resilience from intake to the end of the PTSD program*

	Pre-test	Post-test	Effect	$F(1,64)$	$p$
	Mean ( $\pm$ SD)	Mean ( $\pm$ SD)	size (d)		
Hardiness	79.25 $\pm$ 13.72	83.16 $\pm$ 16.01	.26	6.04	.017*
Self-efficacy	25.05 $\pm$ 5.73	25.80 $\pm$ 6.69	.12	1.26	.27
Social support	44.14 $\pm$ 11.18	44.84 $\pm$ 10.60	.06	.42	.52
Self-deception	78.89 $\pm$ 12.69	79.38 $\pm$ 12.44	.04	.23	.63

\*  $p < .05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ ,  $N = 65$

It was also predicted that quality of life, world assumptions about the self and world, and psychological symptoms would significantly improve over the course of the 8-week treatment program (Hypothesis 4). Four repeated measures ANOVAs were

conducted to examine if quality of life (Total WHOQoL-BREF and its subscales) significantly changed from pre-test to post-test. Results showed that quality of life in all domains was significantly higher at the end of the program compared to intake. Table 31 displays the results of each test.

Table 31. *Comparison of quality of life at the start and the end of the PTSD program*

	Pre-test Mean ( $\pm$ SD)	Post-test Mean ( $\pm$ SD)	Effect size (d)	F(1,64)	<i>p</i>
WHOQoL-BREF Physical Health	36.34 $\pm$ 15.27	43.25 $\pm$ 18.21	.41	17.62	.0005***
WHOQoL-BREF Psychological health	32.43 $\pm$ 14.27	40.38 $\pm$ 18.19	.49	21.06	.0005***
WHOQoL-BREF Social Relationships	34.74 $\pm$ 23.37	42.44 $\pm$ 22.47	.34	11.65	.001**
Total WHOQoL-BREF	185.11 $\pm$ 64.91	232.30 $\pm$ 72.14	.69	53.01	.0005***

\*  $p < .05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ ,  $N = 65$

In contrast to the prediction, results of repeated measures ANOVAs showed that assumptions about the self, others, and world (World Assumption Scale scores) were not significantly different from intake to the end of the program. Table 32 displays the results of univariate tests.

With regards to psychological symptoms, results were in support of Hypothesis 4. Specifically, a doubly multivariate ANOVA revealed a significant improvement in psychological health from intake to the end of the PTSD program,  $F(6,59) = 8.82$ ,  $p = 0.0005$ , partial  $\eta^2 = .47$ . Table 33 displays the results of univariate tests. Participants reported significantly lower levels of anxiety, depression, alcohol use, and PTSD symptoms at the end of the program relative to scores at intake. Interestingly,

significant changes were not observed for the frequency of dissociation or severity of dissociation, although both forms of dissociation appeared to increase slightly over time.

Table 32. *Changes in world assumptions over the course of the PTSD program*

	Pre-test Mean ( $\pm$ SD)	Post-test Mean ( $\pm$ SD)	Effect size (d)	F(1,64)	P
Justice	12.06 $\pm$ 3.13	12.33 $\pm$ 3.45	.08	.40	.53
Benevolence of People	14.26 $\pm$ 3.76	13.89 $\pm$ 4.30	.09	.73	.40
Randomness	14.78 $\pm$ 3.30	15.36 $\pm$ 3.11	.18	1.73	.19
Benevolence of the World	13.34 $\pm$ 4.01	12.94 $\pm$ 4.73	.09	.70	.41
Self-Worth	12.63 $\pm$ 4.04	12.70 $\pm$ 4.30	.02	.04	.84
Luck	12.17 $\pm$ 4.27	12.36 $\pm$ 4.88	.04	.20	.65
Controllability	13.97 $\pm$ 3.67	13.55 $\pm$ 3.72	.11	1.01	.32
Self-Controllability	15.74 $\pm$ 3.12	15.47 $\pm$ 3.18	.09	.85	.36
Total WAS score	108.84 $\pm$ 16.94	108.44 $\pm$ 16.01	.02	.07	.79

\*  $p < .05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ ,  $N = 65$

Table 33. *Changes in psychological health from the start to the end of the PTSD program*

	Pre-test Mean ( $\pm$ SD)	Post-test Mean ( $\pm$ SD)	Effect size (d)	F(1,64)	p
AUDIT alcohol use	16.77 $\pm$ 10.07	14.85 $\pm$ 9.61	.20	8.43	.005**
PCL PTSD symptoms	47.09 $\pm$ 9.74	43.06 $\pm$ 12.55	.36	9.63	.003**
HADS Anxiety	14.58 $\pm$ 3.11	13.12 $\pm$ 3.73	.43	15.53	.0005***
HADS Depression	13.18 $\pm$ 3.78	10.55 $\pm$ 4.11	.67	43.42	.0005***
Frequency of dissociation	8.99 $\pm$ 3.83	9.15 $\pm$ 4.24	.04	.14	.71
Severity of dissociation	8.85 $\pm$ 4.11	8.86 $\pm$ 4.07	.002	.001	.97

\*  $p < .05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ ,  $N = 65$

### **Relationships between disclosure and resilience at intake to the PTSD program and psychological symptoms, world assumptions, and quality of life at the end of treatment**

As participants tended to improve in mental health indicators following participation in the PTSD program, it was important to examine what factors were related to such improvements. Bivariate correlations were conducted to determine if resilience at intake and disclosure during the trauma sessions were related to psychological symptoms and quality of life scores at the end of treatment (Hypothesis 5). This analysis was conducted as it was expected that people would have greater overall health at the end of the PTSD program following disclosure of traumatic experiences and if they had higher initial resilience levels.

Table 34 shows that generally higher hardiness, self-efficacy, social support, and self-deception at intake to the PTSD program were significantly related to fewer psychological symptoms at the end of the 8-week treatment program. PTSD symptoms and frequency of dissociation at the end of treatment were not significantly related to social support scores at intake, however, those with higher support tended to have lower PTSD symptoms and less frequent dissociation. Severity of dissociation at discharge of the program was not significantly predicted by initial hardiness and social support scores but the relationship was in the expected direction. Alcohol use at the end of the program was not significantly related to resilience or disclosure. With regards to disclosure, participants reported significantly greater PTSD symptomatology and depression at the end of the course if they experienced higher levels of distress when discussing their traumatic experiences within the group trauma sessions.



Table 34. *Correlations among resilience at intake, disclosure, and psychological symptoms at the end of the PTSD program*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<i>Disclosure</i>														
1. Length of disclosure	1.00													
2. Observed distress	.53***	1.00												
3. Confidants' reactions to disclosure	-.58***	-.24†	1.00											
4. Number of session attendees	-.27*	-.08	.16	1.00										
<i>Pre-test resilience</i>														
5. Hardiness	.05	-.03	-.12	.03	1.00									
6. Self-efficacy	.08	-.03	-.09	-.03	.69***	1.00								
7. Social support	.02	-.12	-.08	-.005	.57***	.36**	1.00							
8. Self-deception	.11	.03	-.02	-.02	.41**	.45***	.24†	1.00						
<i>Post-test symptoms</i>														
9. PCL PTSD symptoms	-.02	.31*	-.01	.11	-.24*	-.32*	-.22	-.44***	1.00					
10. HADS Anxiety	-.08	.21	.15	.06	-.36**	-.42**	-.26*	-.41**	.78***	1.00				
11. HADS Depression	-.10	.27*	.19	.20	-.38**	-.47***	-.35**	-.32*	.72***	.71***	1.00			
12. Frequency of dissociation	-.06	.15	.08	.18	-.25*	-.28*	-.16	-.39**	.67***	.67***	.52***	1.00		
13. Severity of dissociation	-.001	.18	.07	.15	-.21	-.24*	-.07	-.35**	.57***	.59***	.45**	.92***	1.00	
14. AUDIT alcohol use	-.08	-.12	.12	.21	.04	-.07	.08	.01	.19	.17	.17	.24	.22†	1.00

\* Correlation is significant at or below the 0.05 level (2-tailed), \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ ). N = 65

Table 35 shows that generally higher resilience at the beginning of the PTSD program was significantly related to higher quality of life at the end of the treatment sessions. The only variables that were not significantly related to social support were physical and psychological health scores, though the relationships were in the expected direction. Participants who showed less distress when discussing their traumatic experiences tended to report more positive social relationships and overall quality of life scores by the end of the program. Though unexpected, participants who received more supportive reactions from facilitators and group members during the trauma sessions tended to report lower psychological health at the end of the program.

Although not specifically predicted, Table 36 shows that higher resilience at intake was significantly related to more positive assumptions about the self, others, and the world at the end of the PTSD program (with the exception of Randomness and Justice beliefs). Higher resilience (hardiness, self-efficacy, social support, and self-deception) at intake to the program were significantly related to higher benevolence of the world, self-worth, luck, self-controllability, and overall world assumption scores at the end of the program. Participants tended to report that outcomes were controllable and the world was a just place if they discussed their traumatic experiences for longer.

### **Did disclosure during treatment account for improvements in psychological symptoms when participants' pre-test resilience scores were taken into account?**

Hierarchical regression analyses were conducted to examine whether disclosure (length of disclosure, observed distress, confidants' reactions to disclosure, and the number of session attendees) was a significant predictor of post-test psychological

Table 35. Correlations among resilience at intake, disclosure, and quality of life at the end of the PTSD program

	1	2	3	4	5	6	7	8	9	10	11	12
<i>Disclosure</i>												
1. Length of disclosure	1.00											
2. Observed distress	.53****	1.00										
3. Confidants' reactions to disclosure	-.58****	-.24†	1.00									
4. Number of session attendees	-.27*	-.08	.16	1.00								
<i>Pre-test resilience scores</i>												
5. Hardiness	.05	-.03	-.12	.03	1.00							
6. Self-efficacy	.08	-.03	-.09	-.03	.69****	1.00						
7. Social support	.02	-.12	-.08	-.005	.57****	.36**	1.00					
8. Self-deception	.11	.03	-.02	-.02	.41**	.45****	.24†	1.00				
<i>Post-test WHOQoL-BREF measures</i>												
9. WHOQoL-BREF Physical health	.08	-.21	-.14	.04	.26**	.38**	.09	.25*	1.00			
10. WHOQoL-BREF Psychological health	.21	-.18	-.29*	-.05	.38**	.45****	.22	.38**	.77****	1.00		
11. WHOQoL-BREF Social Relationships	-.03	-.27*	-.04	.02	.45****	.31*	.51****	.43****	.14	.36**	1.00	
12. Total WHOQoL-BREF quality of life	.10	-.26*	-.16	-.04	.41**	.47****	.31*	.47****	.80****	.90****	.57****	1.00

\* Correlation is significant at or below the 0.05 level (2-tailed), \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ ). N = 65

Table 36. Disclosure and pre-test resilience measures: Relationships to World Assumptions Scale (WAS) scores at the end of the PTSD program

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
<i>Disclosure</i>																	
1. Length of disclosure	1.00																
2. Observed distress	.53***	1.00															
3. Confidants' reaction to disclosure	-.58***	-.24†	1.00														
4. No. of session attendees	-.27*	-.08	.16	1.00													
<i>Pre-test resilience</i>																	
5. Hardiness	.05	-.03	-.12	.03	1.00												
6. Self-efficacy	.08	-.03	-.09	-.03	.69***	1.00											
7. Social support	.02	-.12	-.08	-.005	.57***	.36**	1.00										
8. Self-deception	.11	.03	-.02	-.02	.41**	.45***	.24†	1.00									
<i>Post-test WAS scores</i>																	
9. Justice	.25*	.18	-.12	-.09	.21	.24†	.09**	.11	1.00								
10. Benevolence of People	.17	.04	-.03	-.11	.29*	.12	.42**	.11	.18	1.00							
11. Randomness	.05	-.13	.15	.15	-.03	-.06	-.009	.10	-.07	.22	1.00						
12. Benevolence of World	.23	.06	-.15	-.06	.30*	.30*	.43***	.25*	.32*	.78***	.10	1.00					
13. Self-Worth	.06	-.06	-.09	-.01	.69***	.63***	.49***	.56***	.33*	.37**	-.07	.44***	1.00				
14. Luck	.08	-.07	-.02	-.02	.64***	.53***	.58***	.32*	.38**	.58***	.17	.59***	.58***	1.00			
15. Controllability	.26*	.003	-.13	-.13	.35**	.38**	.23†	.14	.62***	.22	-.08	.36**	.47***	.46***	1.00		
16. Self-Controllability	.16	.12	-.15	-.16	.43***	.52***	.36**	.56***	.41**	.30*	.04	.44***	.59***	.60***	.45***	1.00	
17. Total WAS	.24†	.03	-.12	-.10	.58***	.54***	.51***	.42***	.56***	.68***	.21	.79***	.73***	.83***	.66***	.70***	1.00

\* Correlation is significant at or below the 0.05 level (2-tailed), \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ ). N = 65

symptoms, after controlling for pre-test resilience scores (Hypothesis 5 continued). In Step 1, all pre-test resilience measures (pre-test hardiness, self-efficacy, self-deception, and social support) were added to the model to determine if they significantly predicted post-test psychological symptoms. Then in Step 2, all disclosure variables (length of disclosure, observed distress, confidants' reactions to disclosure, and number of session attendees) were added to examine whether they significantly added to the predictive power of the model. The dependent variables were the post-test scores for each of the psychological symptom measures (post-test HADS Anxiety, HADS Depression, PCL PTSD symptoms, AUDIT alcohol use, frequency of dissociation, and severity of dissociation). Age, education level, and employment status were not used in these analyses as no psychological health measure at the end of treatment was significantly related to these demographic variables. Before conducting analyses, assumptions were examined and no violations were observed.

**PCL PTSD symptoms.** Table 37 shows that the combined resilience measures at intake to the program significantly predicted PCL PTSD symptom scores at the end of treatment in Step 1, Multiple  $R = .47$ ,  $F(4, 60) = 4.32$ ,  $p = .004$ . In Step 2, the inclusion of disclosure variables added significantly to the model, Multiple  $R = .59$ ,  $F(4, 56) = 2.65$ ,  $p = .043$ . Overall, the combined predictor variables significantly explained 25.4% of the variance in PCL PTSD scores at the end of the PTSD program, Multiple  $R = .59$ ,  $F(8, 56) = 3.72$ ,  $p = .002$ . Specifically, results suggested that individuals reported lower PTSD symptoms at the end of the program if they had higher self-deception at intake to the treatment program and displayed lower levels of distress when discussing their traumas.

Table 37. PTSD symptoms at the end of the treatment program as predicted by initial resilience levels and trauma-related disclosure

	B	SE B	$\beta$
Step 1			
Hardiness	.09	.16	.10
Self-efficacy	-.39	.35	-.18
Social support	-.14	.16	-.12
Self-deception	-.37	.13	-.37*
Step 2			
Hardiness	.05	.16	.06
Self-efficacy	-.32	.34	-.15
Social support	-.06	.15	-.06
Self-deception	-.37	.12	-.38**
Length of disclosure	-.20	.16	-.19
Observed distress	.37	.12	.40**
Confidants' reactions to disclosure	-1.52	3.79	-.05
Number of session attendees	.86	1.17	.08

Note  $R^2 = .22$  for Step 1 ( $p < .005$ );  $\Delta R^2 = .13$  for Step 2 ( $p < .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**HADS Anxiety.** As shown in Table 38, resilience scores at intake to the PTSD program significantly predicted HADS Anxiety scores at the end of treatment in Step 1, Multiple  $R = .50$ ,  $F(4, 60) = 4.94$ ,  $p = .002$ . In Step 2, the disclosure variables did not produce a significant change in the adjusted R value, Multiple  $R = .57$ ,  $F(4, 56) = 1.66$ ,  $p = .173$ . Overall, the combined predictor variables significantly explained 23.1% of the variance in HADS Anxiety scores at the end of the PTSD program, Multiple  $R = .57$ ,  $F(8, 56) = 3.41$ ,  $p = .003$ . Specifically, results suggested that individuals reported fewer anxiety symptoms at the end of the program if they had higher self-deception at intake to the treatment program.

Table 38. *Anxiety at the end of the PTSD program as predicted by resilience scores at intake to the program and trauma-related disclosure*

	B	SE B	$\beta$
Step 1			
Hardiness	-.01	.05	-.04
Self-efficacy	-.16	.10	-.24
Social support	-.03	.05	-.09
Self-deception	-.08	.04	-.27*
Step 2			
Hardiness	-.01	.05	-.04
Self-efficacy	-.14	.10	-.22
Social support	-.01	.05	-.05
Self-deception	-.08	.04	-.28*
Length of disclosure	-.03	.05	-.11
Observed distress	.08	.04	.30*
Confidants' reactions to disclosure	1.04	1.14	.12
Number of session attendees	.06	.35	.02

Note  $R^2 = .25$  for Step 1 ( $p < .05$ );  $\Delta R^2 = .08$  for Step 2 ( $p > .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**HADS Depression.** In Step 1, the resilience scores at the start of the PTSD program significantly predicted HADS Depression scores at the end of treatment, Multiple  $R = .52$ ,  $F(4, 60) = 5.57$ ,  $p = .001$  (refer to Table 39). In Step 2, the inclusion of disclosure variables added significantly to the model, Multiple  $R = .64$ ,  $F(4, 56) = 3.37$ ,  $p = .015$ . Overall, the predictor variables significantly explained 32.9% of the variance in HADS Depression scores at the end of the PTSD program, Multiple  $R = .64$ ,  $F(8, 56) = 4.92$ ,  $p = .0005$ . Results suggested that individuals reported less depression at the end of the PTSD program if they had higher self-efficacy at intake to the treatment program and displayed lower levels of distress when discussing their traumas.

Table 39. *Depressive symptoms at the end of the PTSD program as predicted by trauma-related disclosure and resilience levels at intake to the program*

	B	SE B	$\beta$
Step 1			
Hardiness	.01	.06	.04
Self-efficacy	-.27	.11	-.38*
Social support	-.08	.05	-.21
Self-deception	-.04	.04	-.12
Step 2			
Hardiness	.04	.05	.02
Self-efficacy	-.24	.11	-.34*
Social support	-.05	.05	-.15
Self-deception	-.04	.04	-.13
Length of disclosure	-.04	.05	-.14
Observed distress	.11	.04	.36**
Confidants' reactions to disclosure	1.22	1.18	.13
Number of session attendees	.53	.36	.15

Note  $R^2 = .27$  for Step 1 ( $p < .005$ );  $\Delta R^2 = .14$  for Step 2 ( $p < .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**Frequency of dissociation.** As shown in Table 40, the combined resilience scores at the start of the PTSD program significantly predicted the frequency of dissociation scores at the end of the PTSD course at Step 1, Multiple  $R = .41$ ,  $F(4, 60) = 2.95$ ,  $p = .027$ . In Step 2, disclosure variables did not produce a significant change in the adjusted R value, Multiple  $R = .48$ ,  $F(4, 56) = 1.18$ ,  $p = .33$ . Overall, there was a marginally significant finding with the predictor variables explaining 11.9% of the variance in frequency of dissociation scores at the end of the PTSD program, Multiple  $R = .48$ ,  $F(8, 56) = 2.08$ ,  $p = .053$ . Specifically, results suggested that individuals with higher self-deception scores at intake tended to dissociate less frequently at the end of the PTSD program.



Table 40. *The ability of trauma-related disclosure and initial resilience to predict frequency of dissociation at post-test*

	B	SE B	$\beta$
Step 1			
Hardiness	-.01	.06	-.05
Self-efficacy	-.07	.12	-.10
Social support	-.007	.05	-.02
Self-deception	-.11	.05	-.32*
Step 2			
Hardiness	-.02	.06	-.07
Self-efficacy	-.04	.12	-.07
Social support	.007	.06	.02
Self-deception	-.11	.05	-.33*
Length of disclosure	-.01	.06	-.05
Observed distress	.06	.04	.21
Confidants' reactions to disclosure	.61	1.39	.06
Number of session attendees	.57	.43	.16

Note  $R^2 = .17$  for Step 1 ( $p < .05$ );  $\Delta R^2 = .06$  for Step 2 ( $p > .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**Severity of dissociation.** Table 41 shows which resilience and disclosure variables predicted severity of dissociation at the end of the PTSD program. In Step 1, the resilience scores at intake to the program approached significance with regards to predicting severity of dissociation scores at the end of treatment, Multiple  $R = .36$ ,  $F(4, 60) = 2.27$ ,  $p = .071$ . In Step 2, the disclosure variables did not produce a significant change in the adjusted R value, Multiple  $R = .45$ ,  $F(4, 56) = 1.22$ ,  $p = .311$ . Although the overall model was not significant ( $F(8, 56) = 1.77$ ,  $p = .103$ ), individuals reported less severe dissociation at the end of the program if they had higher self-deception scores at intake.

Table 41. *The predictive ability of disclosure and initial resilience levels in terms of severity of dissociation at the end of the PTSD program*

	B	SE B	$\beta$
Step 1			
Hardiness	-.02	.06	-.06
Self-efficacy	-.07	.12	-.09
Social support	.02	.05	.06
Self-deception	-.10	.05	-.30*
Step 2			
Hardiness	-.02	.06	-.08
Self-efficacy	-.04	.12	-.07
Social support	.04	.05	.11
Self-deception	-.10	.04	-.31*
Length of disclosure	.06	.06	.02
Observed distress	.07	.04	.22
Confidants' reactions to disclosure	.88	1.36	.10
Number of session attendees	.50	.42	.15

Note  $R^2 = .13$  for Step 1 ( $p > .05$ );  $\Delta R^2 = .07$  for Step 2 ( $p > .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**AUDIT alcohol use.** Table 42 displays which pre-test resilience scores and disclosure variables predicted AUDIT alcohol use at the end of the PTSD program. In Step 1, the resilience scores at the start of the program did not significantly predict AUDIT alcohol use scores at the end of treatment, Multiple  $R = .15$ ,  $F(4, 60) = .36$ ,  $p = .83$ . In Step 2, the inclusion of the disclosure variables did not produce a significant change in the adjusted R value, Multiple  $R = .29$ ,  $F(4, 56) = .90$ ,  $p = .47$ . Overall, the combined predictor variables did not significantly predict AUDIT alcohol use scores at post-test of the PTSD program, Multiple  $R = .29$ ,  $F(8, 56) = .63$ ,  $p = .75$ .

Table 42. *Alcohol use at completion of the PTSD program as predicted by trauma-related disclosure and resilience levels at the start of the program*

	B	SE B	$\beta$
<b>Step 1</b>			
Hardiness	.08	.14	.12
Self-efficacy	-.32	.30	-.19
Social support	.06	.13	.07
Self-deception	.02	.11	.03
<b>Step 2</b>			
Hardiness	.08	.14	.11
Self-efficacy	-.29	.31	-.17
Social support	.05	.14	.06
Self-deception	.02	.11	.03
Length of disclosure	.08	.15	.10
Observed distress	-.08	.11	-.12
Confidants' reactions to disclosure	2.57	3.44	.12
Number of session attendees	1.58	1.06	.20

Note  $R^2 = .02$  for Step 1 ( $p > .05$ );  $\Delta R^2 = .06$  for Step 2 ( $p > .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

In summary, the results generally showed that participants tended to have better psychological health at the end of the PTSD program if they began the study with higher resilience (particularly higher self-deception or self-efficacy) and if they displayed lower levels of distress when discussing their traumatic experiences during group therapy.

### **Participants' initial levels of resilience and subsequent disclosure as predictors of quality of life at the end of the PTSD program**

Hierarchical regression analyses were conducted to examine whether disclosure (length of disclosure, observed distress, confidants' reactions to disclosure, and the

number of session attendees) was a significant predictor of quality of life scores at the end of the PTSD treatment program, after resilience scores at intake to the program were taken into account (Hypothesis 5 continued). Age, education level, and employment status were not used in these analyses as they were not significantly related to post-test quality of life scores. Preliminary tests were conducted and indicated that no serious violations of assumptions occurred. In Step 1, initial resilience scores (pre-test hardiness, self-efficacy, self-deception, and social support) were added to the model to determine whether they were significant predictors of quality of life scores at the end of the PTSD program. In Step 2, all disclosure variables (length of disclosure, observed distress, confidants' reactions to disclosure, and number of session attendees) were added to determine whether they could significantly add to the predictive power of the model. Total WHOQoL quality of life and subscale scores at the end of the PTSD program were the dependent variables in the regression analyses (post-test WHOQoL-BREF Physical health, WHOQoL-BREF Psychological health, WHOQoL-BREF Social relationships, and Total WHOQoL-BREF scores).

**WHOQoL Overall quality of life.** Table 43 shows that resilience scores at intake significantly predicted overall quality of life scores (Total WHOQoL-BREF) at the end of treatment at Step 1, Multiple  $R = .57$ ,  $F(4, 60) = 703$ ,  $p = .005$ . In Step 2, the inclusion of disclosure variables added significantly to the model, Multiple  $R = .66$ ,  $F(4, 56) = 2.68$ ,  $p = .04$ . Overall, the predictor variables significantly explained 34.7% of the variance in quality of life scores at the end of the PTSD program, Multiple  $R = .66$ ,  $F(8, 56) = 5.25$ ,  $p = .0005$ . Thus, overall quality of life at the end of the PTSD program appeared to be significantly higher among participants who were high self-deceivers at

intake to the PTSD program, and among those who displayed lower levels of distress when discussing their traumas.

Table 43. Overall quality of life at the end of the PTSD program as predicted by initial levels of resilience and subsequent disclosure

	B	SE B	$\beta$
<b>Step 1</b>			
Hardiness	.20	.88	.04
Self-efficacy	3.23	1.91	.26
Social support	.82	.84	.13
Self-deception	1.74	.69	.31*
<b>Step 2</b>			
Hardiness	.25	.84	.05
Self-efficacy	2.92	1.82	.23
Social support	.47	.80	.07
Self-deception	1.80	.66	.32*
Length of disclosure	1.13	.87	.19
Observed distress	-1.95	.64	-.37**
Confidants' reactions to disclosure	-15.86	20.37	-.10
Number of session attendees	.74	6.29	.01

Note  $R^2 = .32$  for Step 1 ( $p < .0005$ );  $\Delta R^2 = .11$  for Step 2 ( $p < .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**WHOQoL Physical health.** As displayed in Table 44, resilience scores at intake to the program significantly predicted WHOQoL-BREF Physical health scores at the end of treatment in Step 1, Multiple  $R = .39$ ,  $F(4, 60) = 2.68$ ,  $p = .04$ . In Step 2, the inclusion of disclosure variables did not add significantly to the model, Multiple  $R = .49$ ,  $F(4, 56) = 1.71$ ,  $p = .160$ . Overall, the predictor variables significantly explained 13.6% of the variance in WHOQoL Physical health scores at the end of the PTSD program, Multiple  $R = .49$ ,  $F(8, 56) = 2.26$ ,  $p = .036$ . Results suggested that individuals reported

fewer physical health problems at the end of the program if they displayed lower levels of distress when discussing their traumas. There was some indication that higher self-efficacy at intake predicted fewer physical health problems at the end of the PTSD program.

Table 44. *Physical health at the end of the PTSD program as predicted by initial levels of resilience and subsequent disclosure*

	B	SE B	$\beta$
Step 1			
Hardiness	.03	.25	.02
Self-efficacy	1.07	.54	.34*
Social support	-.09	.24	-.06
Self-deception	.14	.19	.10
Step 2			
Hardiness	.02	.25	.02
Self-efficacy	1.03	.53	.32†
Social support	-.17	.23	-.10
Self-deception	.16	.19	.11
Length of disclosure	.26	.25	.17
Observed distress	-.43	.19	-.33*
Confidants' reactions to disclosure	-4.43	5.91	-.11
Number of session attendees	1.39	1.82	.09

Note  $R^2 = .15$  for Step 1 ( $p < .05$ );  $\Delta R^2 = .09$  for Step 2 ( $p > .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

† = trend towards significance ( $p > .05$  but  $< .07$ )

**WHOQoL Psychological health.** Table 45 shows resilience at intake significantly predicted WHOQoL-BREF Psychological health scores at the end of the program in Step 1, Multiple  $R = .50$ ,  $F(4, 60) = 4.89$ ,  $p = .002$ . In Step 2, the inclusion of disclosure variables produced a significant change in the adjusted R value, Multiple  $R = .63$ ,  $F(4, 56) = 3.66$ ,  $p = .01$ . Overall, the predictors significantly explained 31.7% of

the variance in WHOQoL-BREF Psychological health scores at the end of the PTSD program, Multiple R = .40,  $F(8, 56) = 4.71$ ,  $p = .0005$ . Specifically, results indicated that individuals tended to report better psychological health at the end of the program if they displayed lower levels of distress when discussing their traumas in group therapy. There was also some indication that higher self-efficacy at the start of the PTSD program predicted greater psychological health at the end of the PTSD program.

Table 45. *Psychological health at the end of the PTSD program as predicted by initial levels of resilience and subsequent disclosure*

	B	SE B	$\beta$
Step 1			
Hardiness	.10	.23	.08
Self-efficacy	.93	.51	.29†
Social support	.03	.22	.02
Self-deception	.31	.18	.21
Step 2			
Hardiness	.09	.22	.07
Self-efficacy	.84	.47	.27†
Social support	-.05	.21	-.04
Self-deception	.32	.17	.22
Length of disclosure	.39	.22	.26
Observed distress	-.49	.16	-.37**
Confidants' reactions to disclosure	-7.99	5.25	-.20
Number of session attendees	.51	1.62	.03

Note  $R^2 = .25$  for Step 1 ( $p < .005$ );  $\Delta R^2 = .15$  for Step 2 ( $p < .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

† = trend towards significance ( $p > .05$  but  $< .07$ )

**WHOQoL Social Relationships.** Examination of Table 46 shows that resilience scores at intake significantly predicted WHOQoL-BREF Social Relationship scores at

the end of the PTSD program at Step 1, Multiple R = .61,  $F(4, 60) = 8.83$ ,  $p = .0005$ . In Step 2, the inclusion of disclosure variables did not produce a significant change in the adjusted R value, Multiple R = .66,  $F(4, 56) = 1.51$ ,  $p = .21$ . Overall, the predictor variables significantly explained 35.1% of the variance in WHOQoL-BREF Social Relationship scores at the end of the PTSD program, Multiple R = .66,  $F(8, 56) = 5.32$ ,  $p = .0005$ . Therefore, individuals reported higher quality of life with regards to their social relationships by the end of the program if they had higher social support and self-deception at intake to the treatment program, and displayed lower levels of distress when discussing their traumas.

Table 46. *Health of social relationships at the end of the PTSD program as predicted by initial levels of resilience and subsequent disclosure*

	B	SE B	$\beta$
Step 1			
Hardiness	.25	.26	.15
Self-efficacy	-.28	.57	-.07
Social support	.76	.25	.38**
Self-deception	.55	.21	.31*
Step 2			
Hardiness	.27	.26	.16
Self-efficacy	-.33	.56	-.08
Social support	.67	.25	.34*
Self-deception	.57	.20	.32*
Length of disclosure	.12	.27	.07
Observed distress	-.46	.20	-.28*
Confidants' reactions to disclosure	-1.19	6.33	-.02
Number of session attendees	.30	1.95	.02

Note  $R^2 = .37$  for Step 1 ( $p < .0005$ );  $\Delta R^2 = .06$  for Step 2 ( $p > .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .



In summary, these results showed that participants tended to report greater quality of life scores if they began the PTSD program with higher resilience (namely, higher self-deception, social support, and self-efficacy) and if they displayed lower levels of distress when discussing their traumatic experiences during group therapy.

### **Did an increase in resilience or disclosure predict improvements in psychological symptoms from pre-test to post-test?**

Hierarchical regression analyses were conducted to examine whether disclosure (length of disclosure, observed distress, confidants' reactions to disclosure, and the number of session attendees) significantly predicted improved psychological health from intake to the end of the PTSD program, after controlling for increased resilience over the course of the PTSD program (part of Hypothesis 6). In Step 1, change in the resilience measures from intake to the end of treatment (difference scores for hardiness, self-efficacy, self-deception, and social support) were added to the model to determine whether they predicted improvements in psychological symptoms. Then in Step 2, all disclosure variables (length of disclosure, observed distress, confidants' reactions to disclosure, and number of session attendees) were added to determine if they significantly added to the predictive power of the model. The dependent variable was the difference score for each of the psychological health measures (HADS Anxiety, HADS Depression, PCL PTSD symptoms, AUDIT alcohol use, frequency of dissociation, and severity of dissociation). A positive difference score indicated worsening of psychological symptoms whereas a negative difference score indicated a reduction in symptoms. Before conducting analyses, assumptions were examined and no violations were observed.

**PCL PTSD symptoms.** As shown in Table 47, changes in resilience from pre-test to post-test significantly predicted a reduction in PCL PTSD symptoms from intake to the end of treatment, Multiple R = .56,  $F(4, 60) = 6.97$ ,  $p = .0005$ . In Step 2, the inclusion of disclosure variables did not produce a significant change in the adjusted R value, Multiple R = .62,  $F(4, 56) = 1.59$ ,  $p = .19$ . Overall, the predictor variables significantly explained 29.9% of the variance in PCL PTSD symptom from intake to the end of treatment, Multiple R = .62,  $F(8, 56) = 4.42$ ,  $p = .0005$ . Specifically, results suggested that individuals reported fewer PTSD symptoms at the end of the program if they experienced a decrease in self-deception and an increase in hardiness over the treatment sessions, and displayed lower levels of distress when discussing their traumas.

Table 47. *Fewer PTSD symptoms as predicted by disclosure and changes in resilience over the course of the study*

	B	SE B	$\beta$
Step 1			
Hardiness	-.32	.12	-.39*
Self-efficacy	-.36	.29	-.19
Social support	-.11	.14	-.09
Self-deception	.30	.15	.23*
Step 2			
Hardiness	-.30	.13	-.37*
Self-efficacy	-.41	.30	-.21
Social support	-.07	.14	-.06
Self-deception	.31	.15	.24*
Length of disclosure	-.16	.13	-.19
Observed distress	.23	.10	.31*
Confidants' reactions to disclosure	-2.37	3.12	-.10
Number of session attendees	-.08	.99	-.009

Note  $R^2 = .32$  for Step 1 ( $p < .05$ );  $\Delta R^2 = .07$  for Step 2 ( $p > .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**HADS Anxiety.** As displayed in Table 48, changes in resilience significantly predicted a reduction in HADS Anxiety scores from intake to the end of treatment at Step 1, Multiple R = .48,  $F(4, 60) = 4.59$ ,  $p = .003$ . In Step 2, the disclosure variables did not produce a significant change in the adjusted R value, Multiple R = .57,  $F(4, 56) = 1.92$ ,  $p = .119$ . Overall, the predictor variables significantly explained 23.0% of the variance in HADS Anxiety difference scores, Multiple R = .57,  $F(8, 56) = 3.40$ ,  $p = .003$ . This finding indicated that individuals reported significantly lower anxiety at the end of the program if they experienced a decrease in social support and an increase in hardiness over the treatment sessions, and displayed less distress when discussing their traumas.

Table 48. *Reductions in anxiety as predicted by trauma-related disclosure and changes in resilience over the course of the program*

	B	SE B	$\beta$
Step 1			
Hardiness	-.08	.04	-.35*
Self-efficacy	-.14	.09	-.25
Social support	.09	.04	.26*
Self-deception	.05	.05	.14
Step 2			
Hardiness	-.07	.04	-.31*
Self-efficacy	-.13	.09	-.24
Social support	.09	.04	.27*
Self-deception	.05	.05	.15
Length of disclosure	-.04	.04	-.17
Observed distress	.08	.03	.36**
Confidants' reactions to disclosure	.06	.94	.01
Number of session attendees	.10	.30	.04

Note  $R^2 = .23$  for Step 1 ( $p < .05$ );  $\Delta R^2 = .33$  for Step 2 ( $p > .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**HADS Depression.** Table 49 shows that increased resilience over treatment significantly predicted lower HADS Depression scores from intake to the end of treatment in Step 1, Multiple R = .52,  $F(4, 60) = 5.51, p = .001$ . In Step 2, the inclusion of disclosure variables did not add significantly to the model, Multiple R = .60,  $F(4, 56) = 2.12, p = .09$ . Overall, the predictor variables significantly explained 27.4% of the changes in HADS Depression from intake to the end of treatment, Multiple R = .60,  $F(8, 56) = 4.02, p = .001$ . This finding indicated that individuals reported fewer depressive symptoms at the end of the PTSD program if they experienced an increase in hardiness over the treatment sessions.

Table 49. *Reductions in depression as predicted by trauma-related disclosure and increased resilience over the course of the program*

	B	SE B	$\beta$
Step 1			
Hardiness	-.11	.04	-.46**
Self-efficacy	-.10	.09	-.17
Social support	.07	.05	.20
Self-deception	.06	.05	.16
Step 2			
Hardiness	-.10	.04	-.39*
Self-efficacy	-.08	.09	-.13
Social support	.07	.04	.20
Self-deception	.05	.05	.14
Length of disclosure	-.02	.04	-.07
Observed distress	.06	.03	.24†
Confidants' reactions to disclosure	.87	.98	.12
Number of session attendees	.56	.31	.21

Note  $R^2 = .27$  for Step 1 ( $p < .005$ );  $\Delta R^2 = .10$  for Step 2 ( $p > .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

† = trend towards significance ( $p > .05$  but  $< .07$ )

**Frequency of dissociation.** As displayed in Table 50, increased resilience over treatment significantly predicted less frequent dissociation from intake to the end of treatment in Step 1, Multiple R = .39,  $F(4, 60) = 2.74$ ,  $p = .037$ . In Step 2, the inclusion of disclosure variables did not produce a significant change in the adjusted R value, Multiple R = .51,  $F(4, 56) = 1.99$ ,  $p = .11$ . Overall, the predictor variables significantly explained 15.4% of the variance in frequency of dissociation from intake to the end of treatment, Multiple R = .51,  $F(8, 56) = 2.46$ ,  $p = .023$ . The results indicated that individuals who experienced less distress when discussing their traumatic experiences tended to dissociate less frequently at the end of the PTSD program relative to their intake scores.

Table 50. *Reductions in the frequency of dissociation as predicted by trauma-related disclosure and increased resilience over the course of the program*

	B	SE B	$\beta$
Step 1			
Hardiness	-.06	.05	-.20
Self-efficacy	-.10	.11	-.14
Social support	-.18	.05	-.04
Self-deception	-.07	.06	-.15
Step 2			
Hardiness	-.05	.05	-.16
Self-efficacy	-.09	.11	-.14
Social support	-.10	.05	-.02
Self-deception	-.06	.06	-.14
Length of disclosure	-.05	.05	-.17
Observed distress	.10	.04	.38*
Confidants' reactions to disclosure	.15	1.19	.02
Number of session attendees	.12	.38	.04

Note  $R^2 = .15$  for Step 1 ( $p < .05$ );  $\Delta R^2 = .11$  for Step 2 ( $p > .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**Severity of dissociation.** Table 51 shows the results of a regression analysis for severity of dissociation difference scores. In Step 1, increased resilience over the PTSD program did not significantly predict changes in the severity of dissociation from intake to the end of the program, Multiple R = .31,  $F(4, 60) = 1.63$ ,  $p = .178$ . However, the inclusion of disclosure variables added significantly to the model at Step 2, Multiple R = .56,  $F(4, 56) = 4.50$ ,  $p = .003$ . Overall, the predictor variables significantly explained 22.0% of the variance in severity of dissociation from intake to the end of treatment, Multiple R = .56,  $F(8, 56) = 3.25$ ,  $p = .004$ . Results suggested that those who displayed less distress when discussing their traumas tended to report less severe dissociative symptoms over the course of the PTSD program.

Table 51. *Less severe dissociation at post-test as predicted by trauma-related disclosure and increased resilience over the course of the PTSD program*

	B	SE B	$\beta$
Step 1			
Hardiness	-.04	.05	-.14
Self-efficacy	-.008	.12	-.01
Social support	-.12	.06	-.03
Self-deception	-.11	.06	-.24
Step 2			
Hardiness	-.03	.05	-.11
Self-efficacy	-.03	.11	.04
Social support	-.01	.05	-.03
Self-deception	-.10	.06	-.22
Length of disclosure	-.05	.05	-.17
Observed distress	.14	.04	.51***
Confidants' reactions to disclosure	1.58	1.17	.19
Number of session attendees	.05	.37	.02

Note  $R^2 = .10$  for Step 1 ( $p > .05$ );  $\Delta R^2 = .22$  for Step 2 ( $p < .005$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

Table 52. *Alcohol use over treatment as predicted by age, trauma-related disclosure and increased resilience over the course of the PTSD program*

	B	SE B	$\beta$
Step 1			
Age	-.12	.05	-.28*
Step 2			
Age	-.09	.05	-.20
Hardiness	-.09	.07	-.21
Self-efficacy	-.05	.16	-.05
Social support	-.03	.08	-.05
Self-deception	-.16	.09	-.24†
Step 3			
Age	-.10	.06	-.24
Hardiness	-.07	.07	-.19
Self-efficacy	-.11	.17	-.11
Social support	-.01	.08	-.02
Self-deception	-.17	.09	-.26†
Length of disclosure	.06	.08	.15
Observed distress	-.04	.06	-.11
Confidants' reactions to disclosure	-1.01	1.77	-.08
Number of session attendees	.20	.58	.05

Note  $R^2 = .08$  for Step 1 ( $p < .05$ );  $\Delta R^2 = .15$  for Step 2 ( $p < .05$ );  $\Delta R^2 = .03$  for Step 3 ( $p > .05$ ).

\*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ )

**AUDIT alcohol use.** Table 52 (above) shows the results of a regression analysis for AUDIT alcohol use difference scores. Because age was significantly related to changes in AUDIT alcohol use from intake to the end of treatment, it was controlled in the analysis. In Step 1, older participants had significantly lower AUDIT alcohol use scores at the end of the PTSD program, Multiple  $R = .28$ ,  $F(1, 63) = 5.35$ ,  $p = .024$ . In Step 2, the resilience variables produced a significant change in the adjusted R value,

Multiple  $R = .48$ ,  $F(4, 59) = 2.91$ ,  $p = .029$ . In step 3, the inclusion of disclosure variables did not add significantly to the model, Multiple  $R = .51$ ,  $F(4, 55) = .52$ ,  $p = .72$ . Overall, the predictor variables significantly explained 13.7% of the variance in changes of AUDIT alcohol use from intake to the end of treatment, Multiple  $R = .51$ ,  $F(9, 55) = 2.13$ ,  $p = .042$ . Overall results indicated that an increase in self-deception over treatment sessions was related to less alcohol use over the PTSD program, but this finding was only marginally significant.

### **Did an increase in resilience or aspects of disclosure predict improvements in quality of life from pre-test to post-test?**

Tests were also conducted to determine if an increase in resilience from intake to the end of the PTSD program, coupled with a greater level of disclosure during the PTSD program, were significant predictors of improvement in quality of life from intake to the end of treatment (Hypothesis 6 continued). Specifically, hierarchical regression analyses were conducted to examine whether disclosure (length of disclosure, observed distress, confidants' reactions to disclosure, and the number of session attendees) was a significant predictor of improved quality of life from intake to the end of the PTSD program, after controlling for improved resilience scores over the treatment sessions. In the Step 1, increased resilience (difference scores for hardiness, self-efficacy, self-deception, and social support) were added to the model to examine whether they predicted changes in quality of life scores. In Step 2, all disclosure variables (length of disclosure, observed distress, confidants' reactions to disclosure, and number of session attendees) were added to determine whether they significantly added to the predictive



power of the model. The dependent variables were the difference score (post-test scores minus pre-test scores) for each of the quality of life measures (difference score for Total WHOQoL-BREF quality of life, WHOQoL-BREF Physical health, WHOQoL-BREF Psychological health, and WHOQoL-BREF Social Relationships). Higher difference scores indicated that quality of life improved over the course of the PTSD program, whereas lower difference scores indicated that there was a reduction in reported quality of life scores from intake to the end of the PTSD treatment program. As age was significantly related to WHOQoL-BREF Psychological health difference scores, it was controlled in the regression analysis for this variable.

**WHOQoL Overall quality of life.** As shown in Table 53, improved resilience scores over the PTSD program significantly predicted improved Total WHOQoL-BREF quality of life scores from intake to the end of the program at Step 1, Multiple  $R = .52$ ,  $F(4, 60) = 5.59$ ,  $p = .001$ . In Step 2, the inclusion of disclosure variables did not add significantly to the model, Multiple  $R = .61$ ,  $F(4, 56) = 2.15$ ,  $p = .087$ . Overall, the predictor variables significantly explained 27.8% of the variance in Total WHOQoL-BREF quality of life scores over the PTSD program, Multiple  $R = .61$ ,  $F(8, 56) = 4.08$ ,  $p = .001$ . Thus, overall quality of life significantly improved from intake to the end of the PTSD program among participants who improved their hardiness and displayed lower levels of distress when discussing their traumatic experiences.

Table 53. *Increased resilience and subsequent disclosure predicting improved overall quality of life over the course of the PTSD program*

	B	SE B	$\beta$
Step 1			
Hardiness	1.85	.63	.45**
Self-efficacy	1.35	1.48	.14
Social support	-.23	.73	-.04
Self-deception	-1.21	.78	-.19
Step 2			
Hardiness	1.73	.63	.42*
Self-efficacy	.58	1.50	.06
Social support	-.13	.72	-.02
Self-deception	-1.23	.77	-.19
Length of disclosure	.64	.67	.15
Observed distress	-.99	.48	-.26*
Confidants' reactions to disclosure	-19.01	15.83	-.16
Number of session attendees	-5.05	5.05	-.12

Note  $R^2 = .27$  for Step 1 ( $p < .005$ );  $\Delta R^2 = .10$  for Step 2 ( $p > .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**WHOQoL Physical health.** As shown in Table 54, increased resilience over the PTSD program significantly predicted improved WHOQoL-BREF Physical health from intake to the end of the PTSD program, Multiple  $R = .46$ ,  $F(4, 60) = 4.104$ ,  $p = .005$ . In Step 2, the inclusion of disclosure variables produced a significant change in the adjusted R value, Multiple  $R = .60$ ,  $F(4, 56) = 3.26$ ,  $p = .018$ . Overall, the predictors significantly explained 27.2% of the variance in WHOQoL-BREF Physical health from intake to the end of treatment, Multiple  $R = .60$ ,  $F(8, 56) = 3.99$ ,  $p = .001$ . The results indicated that individuals tended to report improved physical health by the end of the PTSD program if their hardiness improved over the treatment sessions, and if they displayed lower levels of distress when discussing their traumatic experiences.

Table 54. *Increased resilience and subsequent disclosure predicting improved physical health over the course of the PTSD program*

	B	SE B	$\beta$
Step 1			
Hardiness	.58	.17	.56**
Self-efficacy	-.17	.39	-.07
Social support	-.29	.19	-.19
Self-deception	-.34	.20	-.21
Step 2			
Hardiness	.56	.16	.54**
Self-efficacy	-.41	.38	-.16
Social support	-.26	.18	-.17
Self-deception	-.36	.20	-.22
Length of disclosure	.15	.17	.14
Observed distress	-.33	.12	-.35*
Confidants' reactions to disclosure	-7.13	4.04	-.24
Number of session attendees	-.93	1.29	-.09

Note  $R^2 = .22$  for Step 1 ( $p < .005$ );  $\Delta R^2 = .14$  for Step 2 ( $p < .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

**WHOQoL Psychological health.** As shown in Table 55, age was a significant predictor of improved WHOQoL-BREF Psychological health from intake to the end of the PTSD program, Multiple  $R = .25$ ,  $F(1, 63) = 4.32$ ,  $p = .042$ . In Step 2, changes in resilience over treatment added significantly to the model, Multiple  $R = .52$ ,  $F(1, 63) = 4.19$ ,  $p = .005$ . In Step 3, the disclosure variables did not produce a significant change in the adjusted R value, Multiple  $R = .56$ ,  $F(4, 56) = .95$ ,  $p = .443$ . Overall, the predictor variables significantly explained 20.7% of the variance in WHOQoL-BREF Psychological health from intake to the end of treatment, Multiple  $R = .56$ ,  $F(8, 56) = 2.86$ ,  $p = .008$ . Therefore, participants reported improved psychological health from the

start to the end of the PTSD program if they were older, and if they reported increased hardiness and reduced self-deception over the treatment sessions.

Table 55. Age, changes in resilience, and subsequent disclosure predicting improved psychological health over the course of the PTSD program

	B	SE B	$\beta$
Step 1			
Age	.29	.14	.25*
Step 2			
Age	.34	.14	.40*
Hardiness	.46	.17	.42*
Self-efficacy	.32	.40	.12
Social support	-.32	.20	-.20
Self-deception	-.41	.22	-.24†
Step 2			
Age	.28	.14	.25*
Hardiness	.49	.18	.45*
Self-efficacy	.11	.42	.04
Social support	-.25	.21	-.16
Self-deception	-.44	.23	-.25*
Length of disclosure	.19	.19	.16
Observed distress	-.13	.14	-.13
Confidants' reactions to disclosure	-4.50	4.43	-.14
Number of session attendees	.48	1.44	.04

Note  $R^2 = .06$  for Step 1 ( $p < .05$ );  $\Delta R^2 = .21$  for Step 2 ( $p < .005$ );  $\Delta R^2 = .05$  for Step 3 ( $p > .05$ ).

\*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ . † = trend towards significance ( $p > .05$  but  $< .07$ )

**WHOQoL Social relationships.** As shown in Table 56, increased resilience over the PTSD program did not significantly predict WHOQoL-BREF Social Relationship scores from intake to the end of treatment, Multiple  $R = .26$ ,  $F(4, 60) =$

1.04,  $p = .39$ . In Step 2, the inclusion of disclosure variables did not produce a significant change in the adjusted R value, Multiple R = .36,  $F(4, 56) = 1.00$ ,  $p = .414$ . Overall, the combined predictors did not significantly explain changes in WHOQoL-BREF Social Relationship from intake to the end of the PTSD program, Multiple R = .36,  $F(8, 56) = 1.02$ ,  $p = .433$ .

Table 56. *Increased resilience and subsequent disclosure predicting the improved health of social relationships over the course of the PTSD program*

	B	SE B	β
Step 1			
Hardiness	.02	.25	.01
Self-efficacy	.04	.58	.01
Social support	.40	.29	.19
Self-deception	.42	.31	.19
Step 2			
Hardiness	-.10	.26	-.07
Self-efficacy	-.002	.61	-.001
Social support	.39	.29	.19
Self-deception	.50	.31	.22
Length of disclosure	.03	.27	.02
Observed distress	-.04	.20	-.03
Confidants' reactions to disclosure	.19	6.47	.005
Number of session attendees	-3.93	2.07	-.26

Note  $R^2 = .07$  for Step 1 ( $p > .05$ );  $\Delta R^2 = .06$  for Step 2 ( $p > .05$ ). \*  $p < 0.05$ , \*\*  $p < .005$ , \*\*\*  $p < .0005$ .

† = trend towards significance ( $p > .05$  but  $< .07$ )

Overall results indicated that participants generally reported greater improvements in quality of life if they developed higher hardiness over the course of the PTSD program and if they displayed lower levels of distress when discussing their traumatic experiences.

## Discussion

One aim of this study was to determine if participants who were more resilient at the beginning of the posttraumatic stress disorder (PTSD) treatment program were also more psychologically healthy at intake, in order to replicate the first study. Another goal was to examine if resilience improved over the course of the PTSD program. A third goal was to determine if participants improved in terms of psychological health, quality of life, and world assumptions following participation in the 8-week PTSD program. It was also important to examine what factors were related to improvements in psychological health and quality of life. For example, was it the case that those people who were more resilient at the start of the PTSD program had better psychological health and quality of life at the end of the program? Or did disclosure contribute to positive changes in health over and above the role of resilience? In addition, did an increase in resilience over the course of the PTSD program contribute to positive changes in psychological health and quality of life?

### **Higher resilience at the start of the PTSD program related to fewer psychological symptoms, more positive world assumptions, and greater quality of life at the start of the program**

It was expected that individuals with higher resilience at intake to the PTSD program would concurrently report significantly lower psychological symptoms, higher quality of life scores, and more positive beliefs about the world and self (Hypothesis 1). In general results supported this hypothesis. With regards to psychological symptoms, participants with higher hardiness, self-efficacy, social support, and self-deception at the start of the PTSD program reported significantly lower anxiety, depression, and PTSD

symptoms at entry to the program. It was also found that participants had less severe dissociative symptoms at entry to the PTSD program if they had significantly higher levels of self-deception and self-efficacy at intake to the 8-week group therapy program. Resilience at intake was also significantly and positively related to quality of life at entry to the PTSD program. Quality of life refers to an overall perception and general evaluation of life (Patrick & Erikson, 1993). In general, participants reported greater physical and psychological health if they began the PTSD program with higher levels of hardiness and self-efficacy. Overall quality of life and the quality of social relationships were higher if individuals began the PTSD program with higher levels of hardiness, social support, self-deception, and self-efficacy.

Replicating the results of the first and second study of this dissertation, it was found that participants with higher resilience at intake to the PTSD program reported significantly more positive beliefs about themselves, others, and the world (higher Total WAS scores) at entry to the treatment program. In line with the two previous studies, participants reported significantly more positive overall worldviews and beliefs regarding self-controllability, luck, and self-worth if they had higher resilience at intake. Higher resilience on all measures at intake (except self-deception) was significantly related to the belief that outcomes were controllable. Participants viewed other people as kind and benevolent if they had higher levels of hardiness and social support at intake to the program. In addition, the world was seen as kinder and benevolent at intake to the program among older participants and among those with higher levels of social support. Taken together, these results highlight the general importance of resilience in terms of quality of life, psychological health, and assumptions that people hold about themselves, others, and the world. Generally, people who entered the treatment program with better

psychological and cognitive resources to deal with stress already exhibited better psychological health before any therapy occurred. The importance of initial levels of resilience with regards to improvements in the PTSD program will be discussed in a later section.

### **Initial world assumptions predicted psychological symptoms at the end of the PTSD program**

As the World Assumption Scale (WAS) was developed to explore distorted beliefs that individuals have following exposure to trauma, it was expected that this scale would be linked to self-reported psychological symptoms such as anxiety, depression, PTSD, alcohol use, and dissociation. Bivariate correlations were conducted to explore whether positive beliefs about the self and world (WAS subscale scores) at intake to the program were significantly associated with fewer reported psychological symptoms at completion of the PTSD program (Hypothesis 2). Overall, results indicated that PTSD symptoms at the end of treatment were lower among those who began the program with more positive world assumptions. Specifically, correlations showed that participants who entered the program with high beliefs in justice reported significantly lower anxiety, depression, frequency of dissociation, and severity of dissociation at completion of the program. Those who held high beliefs in the randomness of events at intake to the course reported significantly lower anxiety and depression at the end of the program. Veterans reported lower anxiety, depression, PTSD symptoms, frequency of dissociation, and severity of dissociation at the end of treatment if they began the program with high levels of self-worth and high perceptions of self-controllability. Feeling 'luckier' than others at the start of the treatment program



was associated with lower levels of reported PTSD symptoms, anxiety, and depression at the end of the 8-week course. Furthermore, participants reported lower alcohol use, anxiety, and depression at the end of the program if they believed that events were controllable at intake. Significant correlations ranged from  $-.25$  to  $-.56$ , which is similar to the findings of Elklit and colleagues (2007) who examined the degree of association between the WAS subscale measures and the Harvard Trauma Questionnaire.

Further tests were conducted to determine which WAS subscale scores were the best predictors of psychological symptoms at the end of the PTSD program. Results suggested that participants who felt 'luckier' at the start of the 8-week treatment program tended to report fewer PTSD symptoms and fewer depressive symptoms at the end of the program. It was also found that individuals reported fewer anxiety symptoms at the end of the program if they had higher self-worth beliefs at intake to the treatment program. Individuals reported fewer and less severe dissociative symptoms at the end of the program if they had higher self-worth at the start of the PTSD treatment program. Alcohol consumption was lower at the end of the program if participants entered the course feeling as though they often did the 'right thing' and engaged in precautionary behaviours (high self-controllability) and if they began the course believing that people have little control over their outcomes (low controllability). The latter finding seems contradictory and may reflect spurious results due to random error.

Overall, the present study showed that people who had more severe PTSD symptoms at the end of treatment perceived the world differently than did those with less severe symptoms at both the beginning and end of treatment. In particular, participants tended to have more negative beliefs about the benevolence of the world, meaningfulness of the world, and worthiness of the self if they had more psychological

symptoms in the form of anxiety, depression, dissociation, alcohol use, and PTSD-specific symptoms. Janoff-Bulman (1989a) indicated that *benevolence of the world* refers to the degree to which one views others (benevolence of people) and the impersonal world (benevolence of the world) as good, kind, and caring. *Meaningfulness of the world* described the distribution of good and bad outcomes (justice, controllability, and randomness) in the world. Whereas *worthiness of self* refers to people's perceptions of themselves as moral and decent individuals (self-worth), feeling protected from ill fortune (luck), and feeling as though one can control their own outcomes by being precautionous (self-controllability).

Results indicated that veterans diagnosed with PTSD tended to report better psychological health if they perceived themselves as worthy and saw the world as meaningful. For example, individuals were found to report more severe and frequent dissociative symptoms at the end of treatment if they began the PTSD program with lower self-worth beliefs. Combat is part of the job description for veterans and often they are placed in situations which may conflict with basic rules that govern civilian culture. Veterans commit and witness acts as part of their jobs that often conflict with their personal or civilian views of what is moral. For example, most people feel that killing others is wrong, but soldiers are obliged to do this at times, as part of their jobs. Dissociation may serve a protective function and allow individuals to 'zone out' and prevent negative thoughts of the self from intruding into their awareness. It was also found that participants with higher anxiety at the end of treatment began the course with lower self-worth beliefs. Participation in the PTSD program allowed individuals to look deeply into themselves and to share their traumatic experiences in a group format. A person who continues to view themselves as immoral, based on their behaviour in

deployments, could possibly feel more anxiety at the end of the PTSD program for fear that other group members judged them for their past transgressions. In a similar manner, it makes sense that individuals would report fewer depressive symptoms or PTSD symptomatology at the end of treatment if they began the course believing that they were lucky individuals that 'come out ahead' in difficult times. These results showed that psychological symptoms at the end of PTSD treatment programs were linked to basic beliefs and assumptions that people held about themselves and the world prior to treatment. A practical implication of this finding is that examination of world assumptions at intake to treatment programs may be useful in predicting the likelihood of improvement after participation in PTSD programs. This highlights the need to continue conducting research on world assumptions, cognitive distortions, and PTSD symptomatology.

### **Improvements observed over the PTSD program**

It was predicted that participants would report increased resilience following participation in the 8-week PTSD program (Hypothesis 3). It was found that self-deception, self-efficacy, and social support tended to increase, but not significantly, over the course of the PTSD program. This result mirrors Kendler's (1997) suggestion that perceived social support is relatively stable and remains unchanged despite exposure to new experiences. Lee and Klein (2002) found that self-deception was a moderately stable trait, however, task-specific traits such as self-efficacy can improve over time. The fact that self-efficacy did not significantly improve over the PTSD program was unanticipated, as facilitators of the program continually encouraged participants to develop more positive impressions of themselves and their ability to persist with tasks.

Findings did suggest, however, that hardiness was significantly higher among participants at the end of the PTSD program compared to scores at entry to the program. Funk and Houston (1987) suggested that individuals with high levels of hardiness tend to have a sense of purpose in their lives (commitment), feel that they can influence their outcomes (control), and see change as a positive and common part of life (challenge). Throughout the PTSD program, participants were given ample opportunity to examine and discuss difficult life circumstances with the hope that participants would realise that they have the capacity to move forward in life and can manage their PTSD symptoms. According to emotion processing theorists (Foa & Cahill, 2001; Foa & Kozak, 1986; Foa & Rothbaum, 1998), individuals are able to develop more positive beliefs about themselves if they discuss overwhelming stressful experiences or traumas with understanding and empathic listeners. Supportive discussions may promote the realisation that they can cope with difficult tasks and this overrides mistaken beliefs of self-incompetence. As this is a tentative explanation for the current results, future research should be conducted to more fully understand the relationship between improved hardiness and participation in group PTSD programs. It would be beneficial for clinicians to understand the specific factors that helped participants to improve their hardiness, as this could be incorporated into existing treatment models.

It was also hypothesised that veterans would develop greater quality of life following participation in the 8-week treatment program (part of Hypothesis 4). In support of this hypothesis, participants reported significantly higher physical, psychological, social, and overall quality of life at the end of the PTSD program relative to initial scores at entry to the program. This result is promising considering previous research has demonstrated a significant impairment in quality of life among those

diagnosed with PTSD (Zatzick et al., 1997a, 1997b). For example, diminished quality of life in terms of low subjective well-being, physical functioning, physical health, and role functioning was significantly higher among male Vietnam veterans with PTSD than those without PTSD (Zatzick et al., 1997a). Interestingly, a similar pattern was observed for female Vietnam veterans who were assessed during the National Vietnam Veterans' Readjustment Study (Zatzick et al, 1997b). Although the current study did not compare quality of life scores of PTSD veterans with non-PTSD counterparts, the results from this analysis suggest that negative evaluations of life held by those with PTSD can positively change following participation in an 8-week PTSD group therapy program. Therefore, the PTSD program appears to play a role in reducing the burden of trauma-related conditions by assisting people in improving their subjective perceptions of life.

In contrast to predictions, overall assumptions about the self and world did not significantly change from entry to the end of the PTSD program (part of Hypothesis 4). This finding was not expected as research has shown that world assumptions and beliefs tend to change following successful exposure treatment (Foa & Jaycox, 1999), which was the mode of therapy utilised in the trauma sessions of the PTSD program. Theorists suggest that exposure treatment provides individuals with the chance to modify basic beliefs and facilitates understanding that a traumatic experience is a single incident in the past. According to proponents of emotional processing theory (Foa & Jaycox, 1999; Foa & Rothbaum, 1998), individuals are able to challenge the belief that the "world is dangerous" and the "self is inept" by repeatedly recounting details of their traumatic event(s) in a safe environment. By discussing traumatic events within a safe therapeutic environment, individuals are able to view the trauma as a unique event and challenge their belief that the trauma is representative of the world and self as a whole. In the

current study, the views that veterans held about the world and self remained fairly constant despite attendance at treatment sessions. This unexpected finding is noteworthy because the sample was quite large for a clinical sample, thus it was less likely to be spurious. Jaycox and Foa (1996) suggested that anger, emotional numbing, or heightened anxiety symptoms during exposure therapy may prevent successful resolution of traumatic memories. It is possible that these symptoms also impeded the modification of distorted assumptions about the self and world, which could account for the unexpected finding. Further research should continue to test whether beliefs that people hold about themselves and the world are malleable to change following participation in PTSD treatment programs.

As previous researchers have demonstrated the beneficial effects of participation in similar PTSD programs (Ehlers et al., 2005), it was also predicted that individuals would report lower alcohol use, less anxiety, less depression, fewer PTSD symptoms, and less severe and frequent dissociative symptoms after treatment (part of Hypothesis 4). Findings indicated that anxiety, depression, alcohol use, and PTSD symptoms at the end of the PTSD program were significantly lower than initial scores. The reductions in symptom measures were relatively small as effect sizes ( $d$ ) ranged from .20 to .67. However, these can be considered moderate levels for clinical treatment research (Cohen, 1988). The finding that psychological symptoms improved over the PTSD program supported the results of Creamer and colleagues (1999), who examined the psychological benefits of attending an Australian 12-week group treatment program for Vietnam veterans ( $N = 419$ ) diagnosed with PTSD. These researchers found that PCL PTSD scores, HADS Anxiety, HADS Depression and AUDIT alcohol use were significantly lower at a 3-month and 9-month follow-up period when compared to initial

baseline scores. The PTSD program examined by Creamer et al. (1999) followed a similar structure to the program examined in the current study as the Australian National Centre for Posttraumatic Mental Health accredited and developed the contents of the training protocols for both treatment programs.

Interestingly, the results of the current study suggested that the frequency and severity of reported dissociation remained fairly stable among participants attending the PTSD program. It is possible that the space between pre- and post-testing was too short to obtain improvements in dissociative scores. A shortcoming of this study was the absence of extended follow-up data as PTSD is generally considered to be a disorder of long duration. As mentioned earlier, extended follow-up was not considered feasible as it would have reduced sample size even more through attrition. Additionally, although participants revealed changes in anxiety, depression, alcohol use, and PTSD symptoms from the start to the end of the program, this does not preclude the possibility that individuals who initially improved would not experience a relapse of symptoms. Future research should be conducted using longer follow-up periods to determine if the gains made through PTSD treatment programs decline over time or remain stable. In addition, future studies would benefit from using a wait-list design to separately examine the effects of emotional traumatic-disclosure from the effects of non-disclosure.

Having established that resilience, psychological health, and quality of life consistently increased over the course of the PTSD course, the next step was to determine if improvements in psychological health was a function of participants' initial levels of resilience, disclosure levels, or increases in resilience over the course of treatment.

**The relationship between resilience, disclosure, psychological symptoms, assumptions about the self and world, and quality of life**

As mentioned earlier, an aim of this study was to determine why psychological health and quality of life scores improved following participation in the 8-week PTSD program. It was expected that participants would display greater improvements in psychological health and quality of life after participating in the PTSD program as a function of trauma-related disclosure and if they began the course with higher resilience (Hypothesis 5). It was also predicted that positive changes in psychological health and quality of life would occur if participants developed greater resilience over the course of the experiment and if they discussed their traumas for a greater length of time, displayed less distress during such discussions, if they received more positive reactions from others when engaging in trauma-related disclosure, and if they had more opportunities to discuss their traumas within the group therapy format (Hypothesis 6).

**Psychological symptoms.** Beginning with psychological symptoms, bivariate correlations showed that higher resilience scores at intake to the PTSD program (higher hardiness, self-efficacy, social support, and self-deception) were significantly related to lower levels of psychological symptoms at the end of the 8-week PTSD treatment program. PTSD symptoms at the end of treatment were not significantly related to social support scores at intake, however, the results were in the predicted direction with fewer PTSD symptoms reported by those with more positive support networks. Severity of dissociation at discharge of the program was not significantly predicted by initial hardiness and social support scores, but the relationship was in the expected direction with less severe dissociation being associated with higher resilience. Alcohol use at the



end of the program was not significantly related to any resilience variable, nor was it related to any disclosure variable. With regards to disclosure, participants reported significantly more PTSD symptoms and depressive symptoms at the end of the PTSD program if they experienced higher levels of distress when discussing their traumatic experiences within the group trauma sessions. Unexpectedly, the type of reactions received following trauma disclosure in the group sessions and the length of time that participants discussed their traumas were unrelated to all psychological health measures. This may be due, in part, to the nature of the group therapy format utilised in this study where efforts were made to give each participant the same amount of time to discuss their experiences and participants were encouraged to support one another when discussing personally distressing experiences. Specifically, this may have resulted in a “ceiling effect” or lack of variability in responses which reduced the sensitivity of the disclosure measure in detecting changes in psychological health. Another limitation of this study was that the measure of disclosure (recording length of trauma disclosure, distress levels while disclosing, and reactions of confidants while discussing traumas) may have been insufficiently sensitive to detect other facets of disclosure that may have still been important. Future studies in this area may benefit from recording the proportion of time participants discussed negative experiences in other sessions, rather than solely examining trauma-related disclosure occurring during the ten group trauma sessions.

Further tests were conducted to determine which disclosure or resilience variables at intake to the program predicted psychological symptoms at the end of the PTSD program. In general, it was found that participants reported fewer psychological symptoms after the 8-week PTSD program if they were observed showing less distress

when discussing their traumatic experiences. This may suggest that although a level of distress is needed for change, too much distress can be counterproductive in terms of psychological health. Alternatively, participants may have exhibited less distress when discussing their traumatic experiences if they were coping better and had less severe psychological symptoms to begin with. Results also suggested that participants who were high self-deceivers at entry to the PTSD program tended to report fewer psychological symptoms when the PTSD program ended. Specifically, participants reported fewer PTSD symptoms, anxiety, frequency of dissociation, and severity of dissociation at the end of treatment if they began the course with high self-deception. Recall that self-deception refers to the ability to view situations in an extremely positive, yet distorted and unrealistic manner (Gur & Sackeim, 1979; Robinson & Ryff, 1999). Self-deception allows individuals to suppress negative perceptions about the self and replace such views with more positive thoughts. In other words, people are able to maintain positive beliefs about themselves by subconsciously ignoring another aspect of reality. This ability could prove useful for veterans who spend a large portion of their military career witnessing or committing acts that conflict with personal morals. The veteran with high self-deception is able to suppress thoughts about the immorality of their actions, justify their behaviour, and maintain an overall positive impression of the self. Therefore, it appears as though the ability to deceive oneself about some aspects of self can increase well-being.

Tests were also conducted to determine if improvements in resilience or disclosure of traumatic experiences were related to a reduction in the number of psychological symptoms reported by participants at the end of the PTSD program (relative to initial scores). Overall, results showed that participants generally reported

fewer psychological symptoms at the end of the PTSD program if their hardiness levels improved. This finding made sense, as individuals with high levels of hardiness tend to feel more in control of their environment, view new situations as challenges, and are committed to completing tasks (Funk, 1992). Therefore, a veteran who developed increased hardiness over the course of the program would be expected to feel more confident in their ability to handle unpleasant situations. In line with suggestions by Kobasa (1979), improved hardiness over treatment provides a form of protection that may help individuals to work through distressing events. As the concept of hardiness appears to be increasingly important, treatment programs for PTSD would benefit profitably by focusing on ways to enhance the level of hardiness held by individuals.

It was also found that participants generally reported fewer psychological symptoms over the course of the PTSD program if they displayed less distress when discussing their traumatic experiences. Although Foa and Rothbaum (1998) suggested that arousal is needed to activate the feared memory to begin reprocessing, excessive distress may interfere with attention and prevent the resolution of the feared traumatic memory. This suggests that the amount of time one spends discussing traumatic experiences is not as important as managing the level of distress triggered by such disclosure. Therefore, if the aim of health workers or PTSD sufferers is to develop fewer psychological symptoms over treatment, efforts should be made to prevent distress levels escalating too far during trauma therapy. Alternatively, the finding may simply reflect the possibility that those who were more distressed during the trauma sessions of the PTSD program were also more distressed at the end of the program. Unfortunately, specific clinical guidelines still remain rather controversial with regards to the optimal circumstances required for effective trauma-related disclosure. However,

most guidelines suggest that individuals show better outcomes if they discuss trauma-related information within a therapeutic context (Foa & Kozack, 1985; Foa & Rothbaum, 1998). Further research is needed to examine the efficacy of trauma disclosure during group therapy and to clarify these alternative interpretations.

**Quality of life.** With regards to quality of life, bivariate correlations showed that higher resilience at intake to the PTSD program was significantly related to higher quality of life at the end of the treatment sessions. Although in the predicted direction, results showed that the physical health and psychological health at the end of treatment were not significantly related to the degree of social support that participants had at entry to the course. Examining the impact of disclosure, participants who showed less distress when discussing their traumatic experiences tended to report more positive social relationships and overall quality of life as measured by the WHOQoL scale at the end of the program. It was also found that participants who reported lower WHOQoL psychological health at the end of the program received more supportive reactions from facilitators and group members during the trauma sessions. Although presumptive, this finding may reflect the fact that facilitators and other group members realised that certain individuals were less satisfied with the quality of their psychological health, and therefore required additional support in order to cope during the trauma sessions. Thus, supportive reactions did not reduce the psychological health of participants, rather those who had inadequate levels of psychological health at baseline tended to attract more support from others when discussing their traumatic experiences.

Hierarchical regressions were conducted to determine which disclosure variables or resilience variables at intake to the program tended to predict quality of life scores at

the end of the PTSD program. In general, participants reported greater quality of life after completion of the PTSD program if they were observed showing less distress when discussing their traumatic experiences. Furthermore, results showed that the participants reported higher quality of life at the end of the treatment program if they had higher levels of self-efficacy, social support, and self-deception at intake to the PTSD program. These results suggest that it may be possible to pinpoint individuals who may not be the suitable for overseas deployments. For example, the presence of supportive others seems to buffer many of the negative consequence of trauma exposure, such as developing psychological conditions like depression (Pierce, Frone, Russell, Cooper, & Mudar, 2000; Takizawa et al., 2006). Thus, military personnel who perceive that they receive little support from family and friends may not be suitable for deployment unless they learn to improve their social relationships. In addition, self-efficacy plays an extremely important role in protecting individuals in the aftermath of trauma. Individuals high in self-efficacy tend to believe that they can personally influence their outcomes and believe that they can competently cope with unpleasant situations (Aspinwall & Richter, 1999; Benight & Bandura, 2004). A short questionnaire could be used prior to deployments to identify whether individuals are able to maintain an efficacious outlook using hypothetical scenarios that may occur while on military deployments. The current study also found that high self-deceivers reported greater quality of life at the end of treatment. According to Nachson (2001) self-deception allows victims of trauma to repress memories of the ordeal, which may inhibit the development of severe PTSD following trauma exposure. Low self-deceivers may not be suitable for deployments or may require further training prior to deployments and more support following their return.

The current study also examined whether improved quality of life from the start to the end of the program could be predicted by disclosure versus improved resilience over the course of the study. It was found that participants held higher quality of life scores from baseline to the end of the PTSD program if they displayed less distress when discussing their traumatic experiences. In addition, a common theme in the results was that an increase in hardiness from intake to the end of the PTSD program was associated with improved quality of life scores over the course of treatment. The outcomes of this analysis could be considered when aiming to increase the overall quality of life of veterans, which in turn may reduce the number of voluntary and medical discharges from Australian Defence Force (ADF). For example, training programs which educate soldiers on ways to improve their resilience could be developed and delivered prior to and following deployments. Such programs could specifically focus on increasing hardiness to ensure that soldiers are better prepared to manage stressful situations. However, attendance at a resilience training program does not necessarily guarantee success on deployments as it is possible that people have an inherent level of resilience that cannot be modified. Future research should be conducted to explore this concept further. Nevertheless, results of the current study suggest that individuals who developed increased confidence, felt more in control, and became more committed to managing distressing situations over the course of the PTSD program reported greater improvements in quality of life in terms of physical and psychological functioning. Future research should be conducted to examine this further, as the finding may have implications for the recovery of those exposed to traumatic experiences.

### **Summary of findings**

Overall, it was found that participants were more psychologically healthy, had more positive world assumptions, and greater quality of life at the beginning of the PTSD program if they also had higher levels of resilience in terms of hardiness, self-efficacy, social support, and self-deception. It was also found that psychological health, quality of life, and hardiness levels significantly improved over the course of the 8-week PTSD program. The finding that world assumptions remained fairly stable over the course of the PTSD program did not support the claims of emotion processing theorists, who suggest that exposure treatment provides individuals with the opportunity to challenge distorted assumptions about the self, others, and world. Jaycox and Foa (1996) suggested that factors such as anger, excessive anxiety, or emotional numbing may prevent successful resolution of traumatic memories and could have prevented the modification of distorted assumptions. Further research needs to be conducted in this area to test the applicability of emotion processing theory in real world situations.

According to emotion processing theorists, arousal is needed to activate the feared memory to begin reprocessing, and PTSD symptoms reduce by increasing the organisation of trauma memories (Foa & Rothbaum, 1998). The basic suggestion was that discussing traumatic memories within a safe therapeutic environment promotes the development of positive assumptions of the self, others, and the world that centre on safety and controllability (Foa & Rothbaum, 1998). A main goal of the study was to determine whether additional improvements could occur following trauma-related discussions, and to determine what factors lead to such improvements. Results showed that participants generally reported fewer psychological symptoms from intake to the end of the PTSD program if their hardiness levels increased or if they displayed less

distress when discussing their traumatic experiences. Specifically, participants reported greater quality of life at the end of the PTSD program if they displayed less distress when discussing their traumatic experiences and if they had high self-efficacy, social support, and self-deception at intake to the program. These findings extend emotion processing theory by showing that resilience and disclosure are related to psychological symptoms, world assumptions, and quality of life in a clinical sample of veterans attending a group PTSD treatment program. The results suggested that treatment programs for PTSD would benefit profitably by focusing on ways to enhance the level of hardiness, self-efficacy, social support, and self-deception held by individuals, while continuing to encourage participants to discuss traumatic experiences without experiencing heightened levels of distress.



## CHAPTER 11

### General discussion and concluding remarks

The primary goal of this thesis was to extend emotion processing theory (Foa & Kozak, 1986) by examining the relationships among emotional disclosure, resilience factors (social support, self-efficacy, hardiness, and self-deception), world assumptions, psychological health, and physical health, following stress and traumatic experiences. Another aim was to identify the situations under which verbal and written disclosure and high resilience resulted in beneficial outcomes. The notion that individuals must confront personal thoughts, feelings, and reactions to traumatic stress in order to cope is firmly entrenched within the psychological literature. Clinicians suggest that it is imperative for individuals to work through distressing events and traumas in order to overcome a range of psychological symptoms (Foa & Kozak, 1985; Foa, Molnar & Cashman, 1995). It is also widely accepted that individuals are better equipped to adjust to extreme stress if they have a high degree of resilience. However, the interplay between disclosure and most known resilience factors have not yet been examined.

The main aim of this dissertation was to examine the role of resilience, including factors such as hardiness, social support, self-efficacy, and self-deception, in terms of well-being following adverse events. Employing a correlational design, results of the first study indicated that individuals with higher levels of hardiness, self-efficacy, and self-deception reported significantly lower levels of anxiety and depression. It was also found that those with higher levels of social support reported significantly fewer depressive symptoms. Individuals with higher resilience were also found to exhibit significantly more positive beliefs about the self, others, and the world. Replicating these results, the second study also indicated that participants tended to report better

psychological and physical health if they had higher levels of resilience. In addition, the second study showed that participants who developed improved hardiness and self-efficacy following written expression of stressful life experiences tended to report improved psychological and physical health. This study builds on previous work, as prior studies have not examined the combined impact of written emotional disclosure and the resilience variables of hardiness, self-efficacy, social support, and self-deception.

In line with the results of the first two studies, the final study found that overall functioning was related to resilience levels. Specifically, participants diagnosed with PTSD had better psychological, physical health, world assumptions, and quality of life both at the start and the end of the PTSD program if they had high levels of resilience. Although an experimental design to test the overall effectiveness of the treatment program was not the goal of the thesis and could not be conducted, the efficacy of PTSD programs has been well established in other studies (Creamer et al., 1999; Ehlers et al., 2005). Therefore it is a reasonable assumption that symptoms generally improved in the treatment group because of participation in the PTSD program and not due to spontaneous remission or the passage of time. It was found that participants who were high self-deceivers at the beginning of the PTSD program tended to report fewer psychological symptoms at both the start and the end of the PTSD program. Results also showed that participants reported higher quality of life at the end of the treatment program if they had higher levels of self-efficacy, social support, and self-deception at intake to the PTSD program. This information has implications for screening procedures designed for military and paramilitary organisations (such as the police) to identify individuals who may be more prone to mental health issues following exposure

to traumatic events. By identifying those more at risk, further training and support could be provided to prevent the occurrence of long-term difficulties. Results also revealed that higher resilience (in particular, higher hardiness) generally was related to fewer psychological symptoms and greater quality of life. Further studies could be conducted to determine if and how treatment programs for PTSD could enhance the level of hardiness held by individuals. It is possible that hardiness is an individual difference variable that may be difficult to alter, but it is worth exploring this possibility. As improved hardiness was consistently found to be associated with improved quality of life and psychological health among veterans diagnosed with PTSD, training programs which educate soldiers on ways to improve their resilience would be invaluable if developed and delivered prior to and following deployments. Such programs could specifically focus on increasing hardiness to ensure that soldiers are better prepared to manage stressful situations.

According to Kobasa (1979), the effects of hardiness on mental health are mediated by the individual's cognitive appraisal of a stressful situation and their repertoire of coping strategies. Specifically, hardiness alters two appraisal components: it reduces the appraisal of threat and increases one's expectations that coping efforts will be successful (Tartasky, 1993). Although the specific mechanism(s) by which hardiness contributes to long term psychological well-being remain speculative (Tartasky, 1993), Kobasa (1979) hypothesized the existence of two mediational pathways. First, hardiness alters the individual's cognitive appraisal process, such that individuals are able to reinterpret adverse experiences (Florian, Mikulincer, & Yaubman, 1995; Tartasky, 1993). Consequently, the level of distress experienced is reduced. Secondly, hardy individuals tend to use adaptive coping strategies once the stress or adversity is

perceived (Tartasky, 1993; Williams et al., 1992). Hardy individuals have been found to rely on active coping strategies which act to cognitively transform a potentially negative event into a growth producing experience (Bigbee, 1985, Florian et al., 1995; Funk, 1992). Previous research findings have provided support for this hypothesis and indicate that individuals with high hardiness are more likely to engage in problem-focused, active, and social support-seeking coping strategies, whereas those low in hardiness tend to engage in avoidance, distancing, or emotion focussed coping (Williams et al., 1992). A wealth of evidence suggests that hardy individuals are better able to mitigate physiological and psychological difficulties when confronted with overwhelming stress, in comparison to less hardy individuals (Banks & Gannon, 1988; Kobassa & Puccetti, 1982; Maddi, 2002). Consistent with this, available research suggests that individuals with high levels of hardiness perceive stressful situations as less threatening and utilise social support more than low hardy people (Florian, Mikulnicer, & Taubman, 1995). However, it is also possible that those with or are able to obtain high levels of social support developed higher hardiness, so that hardiness may have mediated the relationship between social support and psychological health. Funk (1992) postulated that hardiness protects well-being and stimulates effective functioning in response to stressful life circumstances. Future researchers should continue to examine who benefits most from disclosure in group situations and under what conditions as such information may prove fruitful for those recovering from traumatic events.

Another aim of this thesis was to examine the benefits of disclosing stressful events or traumatic experiences. The results of the first study revealed that participants who reported positive world assumptions also reported that they received supportive reactions from others when they discussed personally distressing events. In addition,

there was a tendency (non-significant) for participants who received supportive reactions from a range of people (family, friends, partner, and professional health workers) to report experiencing lower levels of anxiety and depression. These findings may suggest that people are more likely to reap the benefits of disclosure if they receive supportive reactions following such discussions. Results of the first study also revealed that while emotional disclosure was related to overall well-being, denial, in the form of self-deception, was also related to better mental health outcomes. A possible interpretation of this apparent contradiction is that while it may be helpful to purposely discuss stressful experiences under some conditions, there may also be times when it may be more beneficial to repress unwanted thoughts or memories rather than continually rehash negative experiences.

Because verbal disclosure was found to be associated with a range of positive outcomes in the first study, and by other authors (Foa & Kozak, 1985; Foa & Meadows, 1997), it seemed important to examine whether individuals were able to systematically work through their stressful and traumatic life experiences by written disclosure as well. Therefore in the second study, one group of participants was asked to write about personally distressing events over several sessions, while a second group wrote about non-stressful, mundane events. Results of this study indicated that participants who engaged in written disclosure about personally distressing events reported significant improvements in psychological and physical health, compared to those who wrote about mundane day-to-day events, such as household cleaning. These results suggested that written emotional disclosure may be a cost-effective alternative treatment for individuals who are disinclined to enter talk therapy. Thus, there may be more than one way to assist people to process highly stressful and traumatic events.

Group therapy has also been shown to be an effective way to allow individuals to discuss traumatic experiences and overcome unpleasant symptoms (Creamer et al., 1999; Ehlers et al., 2005). The final study examined whether resilience, world assumptions, quality of life, and psychological symptoms improved over the course of an 8-week PTSD program. Another aim of this study was to determine whether disclosure or resilience could explain such improvements. Results consistently showed that participants in a group PTSD program tended to report better psychological and physical health if they expressed less distress when disclosing trauma-related material in group therapy. The type of reactions received from others when discussing traumas and the length of time that one discussed such events did not appear to be as important as one's level of arousal during trauma disclosure. It could also be that participants who started the group PTSD program with a lower ability to cope with stress ended the program with poorer psychological and physical health. According to Foa and Kozak's (1986) emotion processing theory, individuals need to recall and recount past stressful events in order to recover from such events. Specifically, individuals need to be confronted with the feared event (exposure techniques) within a safe environment and given information that is incompatible with the feared event (Foa & Rothbaum, 1998). However the results of Study 3 suggested that positive outcomes generally were not related to greater length of time discussing trauma-related events. It is possible that painful traumatic disclosures, while initially associated with reduced recovery, may eventually aid recovery. Unfortunately, this study did not have an adequately long follow-up period to determine this. The results of the final study suggest that it is vital for individuals to process the feared event without experiencing excessive distress, and this information could be incorporated into emotion processing theory. It is also

possible to suggest that a reasonable level of self-deception and measured distress in discussing traumatic material is the best way to deal with stressful events. Alternatively, the results could reflect either individual differences in coping strategies or provide further insight into how the process of coping might change and evolve over therapy. Individuals with a higher initial level of arousal may have eventually coped better after the sessions, or may have required additional sessions, but the length of the follow-up did not allow the documentation of delayed improvement in this group of participants. Nevertheless, the results of the combined studies highlight the beneficial role of disclosure in terms of working through stressful life events and traumas.

### **Extending the emotion processing model**

The current studies demonstrated that emotion processing theory may be productively extended by including resilience and self-disclosure of stressful and traumatic experiences. The inclusion of these variables into emotion processing theory appears to further explain recovery from stress and trauma. Figure 7 depicts how the results of the current studies add other components to the emotion processing model (refer to page 302).

### **Broader significance of findings**

The emotion processing model provides a proximate approach to explaining how cognitive processes change following stress. However, this model may be productively placed into an even broader context. According to Teicher and colleagues (2002), human beings have consistently been confronted with severe stress and trauma throughout the existence, and it seems likely that natural selection has endowed humans

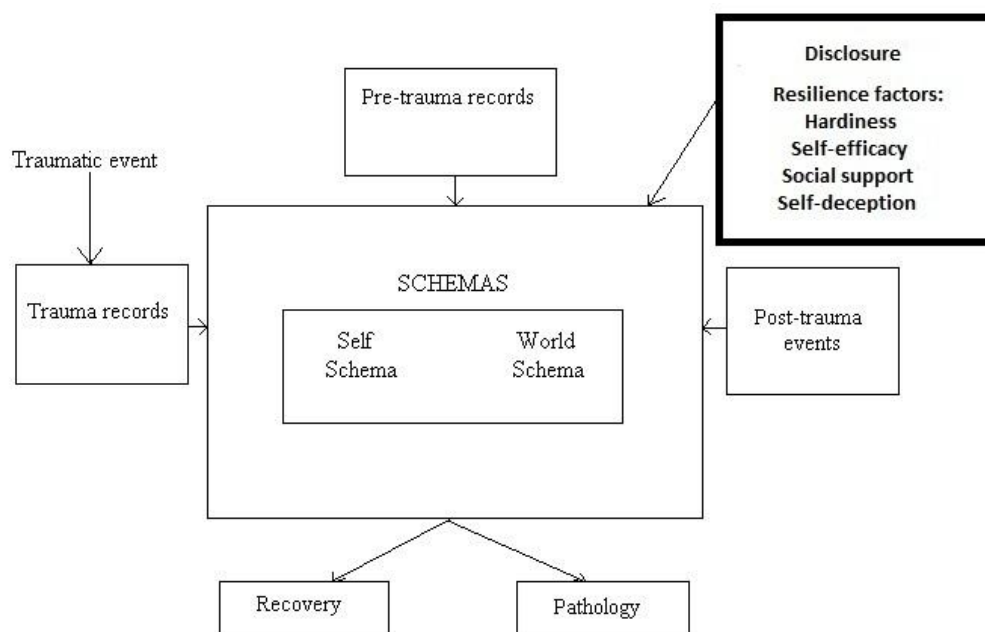


Figure 9.

*Extensions to emotion processing theory based on the results of the current research*

with specific physiological and cognitive mechanisms to cope with such events.

Hardiness, self-efficacy, social support, and self-deception may be considered part of a group of psychological mechanisms or adaptations facilitating our ability for coping with stress and traumatic events. For example, self-deception or optimistic perceptions about the self (such as high self-efficacy) may have allowed our ancestors to persevere with tasks and achieve desired outcomes, despite adversity (Surbey, 2004). According to evolutionary theorists (Alexander, 1987; Trivers, 1976), the existence of cognitive distortions cannot be dismissed as a flaw or mistake in human reasoning. Illusory mechanisms are adaptive in certain situations, such as when a person is powerless to respond to danger or when they receive information from their environment that



conflicts with previously held beliefs (Taylor & Brown, 1988). Furthermore, our ancestors were more likely to survive and reproduce by maintaining positive kin relationships (heightened social support). In turn, by caring for others, individuals were more likely themselves to obtain support in dire times. It is therefore not surprising that positive emotional support consistently was found to be an important predictor in models for examining the outcomes of stressful events in the previous three studies. Thus, the value of the present set of studies goes beyond its implications for the emotion processing model and the clinical or applied ramifications of the findings. These studies also contribute to a greater understanding of the nature and function of inherent human qualities and our ability to respond to our environment, especially to events that threaten our survival.

### **Summary of studies conducted**

In summary, the current series of studies explored whether individuals with specific types of resilience or those who verbally or non-verbally disclosed stressful life experiences were better able to withstand stress and trauma. It was consistently found that the pathogenic effects of stress and trauma were lower among those who had high resilience. It was also found that beneficial outcomes tended to occur in those who had positive reactions from others when discussing their stressful experiences. Despite the frequency with which measures of disclosure, social support, self-deception, hardiness, and self-efficacy have been utilized within stress and trauma research, to date, until now these factors have not been studied together. It is suggested that future research be conducted using samples of participants exposed to different traumatic events (such as victims of sexual assault, domestic violence, natural disasters, and motor vehicle

accidents) to ascertain if the results obtained in the three present studies generalize to other trauma populations. Nevertheless, findings from the studies contribute to specific theories and more general models of human psychology by illuminating the basic characteristics and processes involved in the recovery from overwhelming negative events.

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Appendix A: Ethical approval form and questionnaires for Study 1

**Administrative documentation  
has been removed**

### World Assumption Scale (WAS)

Please answer all questions by marking the appropriate answer in the space next to each statement. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers.

	1	2	3	4	5	6
	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1.						
2.						
3.						
4.						
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31.						

### The Cognitive Hardiness subscale of the Stress Assessment Inventory

Below is a list of common beliefs people hold. How strongly would you have agreed or disagreed with each statement over the last three months? Place a tick in the column that corresponds with your answer.

	Strongly disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
My involvement in non-work activities and hobbies provides me with a sense of meaning and purpose					
By taking part in political and social affairs, people can strongly influence world events and politics					
When all else appears miserable, I can always turn to my family and friends for help and support					
I prefer to do things that are risky, exciting and adventurous rather than stick to the same routine and lifestyle					
Becoming a success is mostly a matter of working hard; luck plays little or no role					
There are few things about which I lack confidence or feel self-conscious or insecure					
In general, I tend to be a bit critical and negative about most things in life					
It wouldn't take much to cause me to leave my present job					
I'm not very satisfied with my day to day involvement in the activities of my family and friends					
In general, I would prefer to have things well planned out in advance rather than deal with the unknown					
Most of life is wasted in meaningless activity					
I often feel awkward, uncomfortable or insecure interacting with others socially					
I rarely find myself saying out loud or thinking that I'm not good enough or not capable of accomplishing something					
I am committed to my job or other activities that I am involved in					
I tend to view most work and life changes, disappointments, and setbacks as threatening, harmful or stressful, rather than challenging					
Just for variety's sake, I often explore new and different routes to places that I travel regularly (eg. Home, work)					
Others will act according to their own self-interests no matter what I attempt to say or do to influence them					
If I get a chance to see how others have done something or get the opportunity to be taught what to do, I am confident that I can be successful at almost anything					
I expect some things to go wrong now and then, but there is little doubt in my mind that I can cope with just about anything that comes my way					

	Strongly disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Overall, most of the things that I am involved in (eg. Work, social activities, relationships) are not very stimulating, enjoyable and rewarding					
I am likely to get frustrated and upset if my plans do not work out as I hoped, or if things do not happen the way I really want them to					
There is a direct relationship between how hard I work and the success and respect that I will have					
I don't feel that I have accomplished much lately that is really important or meaningful with respect to my future goals and objectives in life					
I often think that I am not as good as or less important than others with whom I work or whom I know					
Many times I feel that I have little or no control or influence over things that happen to me					
If anything else changes or goes wrong in my life right now, I feel that I might not be able to cope with it					
When change occurs at work or home I often find myself thinking that the worst is going to happen					
At the moment, things at work and at home are fairly predictable and any more changes would just be too much to handle					
You can't really trust that many people because most people are looking for ways to improve their welfare and happiness at your expense					
Most of the meaning of life comes from internal, rather than external, definitions of success, achievement and self-satisfaction					

### The General Perceived Self-Efficacy Scale

Please answer all questions by marking the appropriate answer in the space next to each statement. Indicate to what extent you feel this way right now, at the present moment.

	<b>Not at all true of me</b>	<b>Hardly true</b>	<b>Moderately true</b>	<b>Exactly true</b>
I can always manage to solve difficult problems if I try hard enough.	1	2	3	4
If someone opposes me, I can find the means and ways to get what I want.	1	2	3	4
It is easy for me to stick to my aims and accomplish my goals.	1	2	3	4
I am confident that I could deal efficiently with unexpected events.	1	2	3	4
Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	2	3	4
I can solve most problems if I invest the necessary effort.	1	2	3	4
I can remain calm when facing difficulties because I can rely on my coping abilities.	1	2	3	4
When I am confronted with a problem, I can usually find several solutions.	1	2	3	4
If I am in trouble, I can usually think of a solution	1	2	3	4
I can usually handle whatever comes my way	1	2	3	4



### Social Support Scale

Please answer all questions by marking the appropriate answer in the space next to each question. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers:

1	2	3	4	5	6
None of the time	Hardly if ever	Once in a while	Quite often	The majority of the time	All of the time

	The people I care about make me feel that they care about me
	The people important to me accept me as I am
	I enjoy the time I spend with the people who are important to me
	The people I care about seem interested in how I'm doing
	The people I care about come through for me when I need them
	When something's on my mind, just talking with the people I know can make me feel better
	The people who are important to me encourage me when I feel discouraged or down
	I enjoy talking about everyday kinds of things with the people I care about
	The people I know are good sources of useful information when I need it
	The people I care about help me out
	When I need someone to help me out, I can usually find someone

### Self-Deception Questionnaire (SDQ)

Please answer the following questions as honestly as possible, keeping in mind that there are no right or wrong answers. Answer all of the questions, but do not spend too much time dwelling on any one answer. Please indicate in the space beside each question the response that is most appropriate for you (where 1 = *never* to 7 = *always*).

Never  Always

1      2      3      4      5      6      7

	Do you ever feel guilty?
	Have you ever felt hatred toward either one of your parents?
	Is it important that other people think highly of you?
	Do you ever feel proud of your accomplishments?
	Do you ever have thoughts that you don't want other people to know that you have?
	Have you ever made a fool of yourself?
	Do you ever feel attracted to people of the same sex?
	Are there things in your life that make you feel unhappy?
	Was your childhood a happy one?
	Have you ever felt vengeful?
	Have you ever felt like you wanted to kill somebody?
	Would you like to know what other people think of you?
	Do you have any bad memories?
	Have you ever thought that your parents hated you?
	Have you ever been uncertain as to whether or not you were homosexual?
	Do you have many friends of the opposite sex?
	Do you have sexual fantasies?
	Were your parents ever mean to you?
	Have you ever doubted your sexual adequacy?
	Have you ever doubted your intellectual adequacy?
	Do you ever get angry?
	Have you ever felt that your feelings of anger might get out of control?
	Have you ever enjoyed your bowel movements?
	Have you ever wanted to rape or be raped by someone?
	Do you find it socially acceptable to spit in public?
	Have you ever thought of committing suicide in order to get back at somebody?
	Have you ever really enjoyed winning a sport?

### The Hospital Anxiety and Stress Scale (HADS)

Please place a circle around the most accurate or appropriate response for each of the questions. It is important to choose the response that describes how you have been feeling recently.

<b>1. I feel tense or 'wound up'</b>			
Not at all time	From time to time, Occasionally	A lot of the time	Most of the
<b>2. I still enjoy the things I used to enjoy</b>			
Hardly at all	Only a little	Not quite so much	Definitely as much
<b>3. I get a sort of frightened feeling as if something awful is about to happen</b>			
Not at all definitely and	A little, but it Doesn't worry me	Yes, but not too badly	Yes, definitely and quite badly
<b>4. I can laugh and see the funny side of things</b>			
Not at all	Definitely not so much now	Not quite so much now	As much as I always could
<b>5. Worrying thoughts go through my mind</b>			
Only occasionally	From time to time, but not too often	A lot of the time	A great deal of the time
<b>6. I feel cheerful</b>			
Most of the time	Sometimes	Not often	Not at all
<b>7. I can sit at ease and feel relaxed</b>			
Not at all	Not often	Usually	Definitely
<b>8. I feel as if I am slowed down</b>			
Not at all	Sometimes	Very often	Nearly all the time
<b>9. I get a sort of frightened feeling like 'butterflies' in the stomach</b>			
Very often	Quite often	Occasionally	Not at all
<b>10. I have lost interest in my appearance</b>			
I take just as much care as ever	I may not take quite as much care	I don't take as much care as I should	Definitely
<b>11. I feel restless as I have to be on the move</b>			
Not at all	Not very much	Quite a lot	Very much indeed
<b>12. I look forward with enjoyment to things</b>			
Hardly at all	Definitely less than I used to	Rather less than I used to	As much as ever did
<b>13. I get sudden feelings of panic</b>			
Not at all	Not very often	Quite often	Very often indeed
<b>14. I can enjoy a good book or radio or TV program</b>			
Very seldom	Not often	Sometimes	Often

### The Appraisal of Life Events Scale (ALES)

We would like you to rate your perceptions of the stressful event you have just described on the previous page. Use the following six point scales (where 0 = not at all to 5 = very much so) to indicate the extent to which each of the adjectives listed below describes your perceptions of the event when the event occurred. Do this by circling the appropriate point on the scales. Please respond as quickly as possible as first responses are usually more accurate. Please make a response to each adjective.

At the time it occurred, the event was:

	Not at all					Very much so
	0	1	2	3	4	5
1.	Threatening 0	1	2	3	4	5
2.	Fearful 0	1	2	3	4	5
3.	Enjoyable 0	1	2	3	4	5
4.	Worrying 0	1	2	3	4	5
5.	Hostile 0	1	2	3	4	5
6.	Challenging 0	1	2	3	4	5
7.	Stimulating 0	1	2	3	4	5
8.	Exhilarating 0	1	2	3	4	5
9.	Painful 0	1	2	3	4	5
10.	Depressing 0	1	2	3	4	5
11.	Pitiful 0	1	2	3	4	5
12.	Informative 0	1	2	3	4	5
13.	Exciting 0	1	2	3	4	5
14.	Frightening 0	1	2	3	4	5
15.	Terrifying 0	1	2	3	4	5
16.	Intolerable 0	1	2	3	4	5

### The Social Readjustment Rating Questionnaire (SRRQ)

In the past year, which of the following events have taken place in your life? Please place a tick next to each event you have experienced in the past 12 months.

<input type="checkbox"/>	Death of Spouse
<input type="checkbox"/>	Divorce
<input type="checkbox"/>	Marital Separation
<input type="checkbox"/>	Jail Term
<input type="checkbox"/>	Death of close family member
<input type="checkbox"/>	Personal injury or illness
<input type="checkbox"/>	Marriage
<input type="checkbox"/>	Fired from work
<input type="checkbox"/>	Marital reconciliation
<input type="checkbox"/>	Retirement
<input type="checkbox"/>	Change in family member's health
<input type="checkbox"/>	Pregnancy
<input type="checkbox"/>	Sex difficulties
<input type="checkbox"/>	Addition to family
<input type="checkbox"/>	Business readjustment
<input type="checkbox"/>	Change in financial status
<input type="checkbox"/>	Death of close friend
<input type="checkbox"/>	Change to a different line of work
<input type="checkbox"/>	Change in number of marital arguments
<input type="checkbox"/>	Mortgage or loan over \$10,000
<input type="checkbox"/>	Foreclosure of mortgage or loan
<input type="checkbox"/>	Change in work responsibilities
<input type="checkbox"/>	Trouble with in-laws
<input type="checkbox"/>	Outstanding personal achievement
<input type="checkbox"/>	Spouse begins or stops work
<input type="checkbox"/>	Starting or finishing school
<input type="checkbox"/>	Change in living conditions
<input type="checkbox"/>	Revision of personal habits
<input type="checkbox"/>	Trouble with boss
<input type="checkbox"/>	Change in work hours, conditions
<input type="checkbox"/>	Change in residence
<input type="checkbox"/>	Change in schools
<input type="checkbox"/>	Change in recreational habits
<input type="checkbox"/>	Change in church activities
<input type="checkbox"/>	Change in social activities
<input type="checkbox"/>	Mortgage or loan under \$10,000
<input type="checkbox"/>	Change in sleeping habits
<input type="checkbox"/>	Change in number of family gatherings
<input type="checkbox"/>	Change in eating habits
<input type="checkbox"/>	Vacation
<input type="checkbox"/>	Christmas season
<input type="checkbox"/>	Minor violation of the law

## Appendix B: Study 1 information sheet and informed consent form

Administrative documentation  
has been removed



## Appendix C: Debriefing sheet for Study 1

Administrative documentation  
has been removed



## Appendix D

*Variables that included missing data*

Percentage of missing data	Variable name
2.80 %	Threat appraisal score
2.80 %	Challenge appraisal score
2.80 %	Loss appraisal score
2.80 %	Category of appraisal (category where participants receive the highest average score)
1.80 %	Number of Confidants
2.80 %	Category of Confidants
1.8 %	Overall Confidants' Reactions to Disclosure
1.8%	Category of reaction
0.90 %	HADS Anxiety score
0.90 %	HADS Depression score

N = 109

## Appendix E

Table 1. *Non-significant differences across outcome measures in terms of education*

	High school or less Mean ( $\pm$ SD)	Trade/TAFE Mean ( $\pm$ SD)	University Mean ( $\pm$ SD)	<i>F</i>	<i>P</i>
Overall Confidants' reactions to disclosure	7.09 $\pm$ 1.70	6.89 $\pm$ 1.97	7.03 $\pm$ 2.01	.09	.91
Family's reaction	7.47 $\pm$ 1.99	6.94 $\pm$ 2.58	7.47 $\pm$ 2.16	.43	.65
Friend's reaction	7.05 $\pm$ 2.16	7.00 $\pm$ 1.75	7.28 $\pm$ 2.19	.10	.91
Partner's reaction	6.91 $\pm$ 2.67	6.25 $\pm$ 2.96	6.42 $\pm$ 3.01	.35	.70
Professional workers	7.31 $\pm$ 1.93	6.42 $\pm$ 3.01	6.76 $\pm$ 1.98	.48	.62
Threat appraisals	17.04 $\pm$ 6.79	16.63 $\pm$ 7.27	16.68 $\pm$ 7.85	.04	.96
Challenge appraisals	11.26 $\pm$ 7.07	12.84 $\pm$ 8.77	9.21 $\pm$ 4.94	1.26	.27
Loss appraisals	10.60 $\pm$ 5.20	11.63 $\pm$ 4.67	9.89 $\pm$ 3.96	.61	.54
SSRQ stress score	192.85 $\pm$ 118.14	160.84 $\pm$ 91.93	192.32 $\pm$ 107.87	.63	.53
HADS Anxiety	7.41 $\pm$ 3.79	7.58 $\pm$ 3.42	8.00 $\pm$ 3.87	.18	.83
HADS Depression	4.47 $\pm$ 3.32	4.58 $\pm$ 3.13	3.89 $\pm$ 3.17	.27	.76
Total WAS score	117.61 $\pm$ 12.75	125.53 $\pm$ 13.79	119.53 $\pm$ 15.31	2.62	.08†
Justice	12.51 $\pm$ 3.45	14.10 $\pm$ 4.38	12.74 $\pm$ 3.80	1.42	.25
Randomness	14.03 $\pm$ 5.33	14.31 $\pm$ 3.16	13.68 $\pm$ 3.61	.12	.89
Benevolence of World	15.73 $\pm$ 3.28	17.68 $\pm$ 2.96	16.63 $\pm$ 3.21	2.90	.06†
Self-Worth	17.56 $\pm$ 3.84	18.16 $\pm$ 3.99	16.63 $\pm$ 3.58	.78	.46
Luck	11.70 $\pm$ 2.74	12.79 $\pm$ 2.41	11.42 $\pm$ 3.25	1.40	.25
Controllability	13.38 $\pm$ 3.25	14.11 $\pm$ 3.77	13.68 $\pm$ 2.75	.39	.68
Self-Controllability	16.37 $\pm$ 2.64	17.37 $\pm$ 2.06	16.84 $\pm$ 2.36	1.28	.28
Hardiness	102.93 $\pm$ 13.30	103.63 $\pm$ 10.84	101.00 $\pm$ 9.97	.24	.78
Self-efficacy	30.92 $\pm$ 4.05	30.47 $\pm$ 2.98	29.89 $\pm$ 3.07	.59	.56
Social support	54.42 $\pm$ 8.35	53.68 $\pm$ 7.82	55.11 $\pm$ 4.35	.16	.85
Self-deception	92.32 $\pm$ 13.03	91.58 $\pm$ 13.57	91.32 $\pm$ 9.94	.06	.94

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; † trend towards significance,  $N = 109$

Table 2. *Non-significant differences across outcome measures in terms of marital status*

	Married/De-facto Mean ( $\pm$ SD)	Not in relationships Mean ( $\pm$ SD)	t	p
Overall Confidants' reactions to disclosure	6.96 $\pm$ 1.84	7.12 $\pm$ 1.76	.46	.64
Family's reaction	7.25 $\pm$ 2.37	7.46 $\pm$ 1.93	.47	.64
Friend's reaction	6.95 $\pm$ 2.25	7.19 $\pm$ 1.94	.54	.59
Partner's reaction	6.61 $\pm$ 3.01	6.68 $\pm$ 2.47	.32	.75
Professional workers	7.29 $\pm$ 2.23	7.23 $\pm$ 1.42	-.09	.93
Loss appraisals	11.58 $\pm$ 5.41	10.03 $\pm$ 4.45	-1.61	.11
SSRQ stress score	184.11 $\pm$ 119.51	189.25 $\pm$ 107.47	.23	.82
HADS Depression	4.79 $\pm$ 3.73	4.12 $\pm$ 2.89	-1.05	.30
<i>WAS scores</i>				
Justice	12.89 $\pm$ 4.21	12.79 $\pm$ 3.34	-.14	.89
Benevolence of People	17.61 $\pm$ 2.50	17.31 $\pm$ 2.44	-.64	.53
Randomness	14.23 $\pm$ 4.01	13.88 $\pm$ 4.02	-.45	.66
Self-Worth	17.75 $\pm$ 3.78	17.34 $\pm$ 3.86	-.55	.58
Luck	12.30 $\pm$ 3.03	11.54 $\pm$ 2.60	-1.39	.17
Controllability	13.64 $\pm$ 3.97	13.51 $\pm$ 2.69	-.19	.85
Hardiness	102.23 $\pm$ 12.02	103.05 $\pm$ 12.59	.34	.74
Self-efficacy	30.59 $\pm$ 3.72	30.71 $\pm$ 3.75	.16	.87
Social support	54.48 $\pm$ 7.89	54.37 $\pm$ 7.58	-.07	.94
Self-deception	92.45 $\pm$ 12.29	91.72 $\pm$ 12.81	-.29	.77

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; † trend towards significance, N = 109

Table 3. *Non-significant differences across outcome measures in terms of employment status*

	Employed Mean ( $\pm$ SD)	Not employed Mean ( $\pm$ SD)	t	p
Overall Confidants' reactions to disclosure	6.95 $\pm$ 1.77	7.17 $\pm$ 1.82	.60	.55
Family's reaction	7.48 $\pm$ 1.93	7.24 $\pm$ 2.36	-.54	.59
Friend's reaction	6.73 $\pm$ 2.22	7.50 $\pm$ 1.82	1.83	.07†
Partner's reaction	6.68 $\pm$ 2.59	6.74 $\pm$ 2.71	.09	.93
Professional workers	6.85 $\pm$ 1.72	7.59 $\pm$ 2.00	1.07	.29
Threat appraisals	17.28 $\pm$ 6.91	16.46 $\pm$ 7.16	-.60	.55
Challenge appraisals	11.09 $\pm$ 7.07	11.29 $\pm$ 7.21	.15	.88
Loss appraisals	10.22 $\pm$ 4.94	11.19 $\pm$ 4.84	1.01	.32
SSRQ stress score	188.60 $\pm$ 104.62	185.43 $\pm$ 121.46	-15	.88
HADS Anxiety	7.44 $\pm$ 3.71	7.67 $\pm$ 3.75	.32	.75
HADS Depression	3.95 $\pm$ 3.07	4.91 $\pm$ 3.40	1.56	.12
Total WAS score	119.85 $\pm$ 13.62	118.67 $\pm$ 13.68	-.45	.66
Justice	13.15 $\pm$ 3.65	12.43 $\pm$ 3.76	-1.01	.31
Benevolence of People	17.10 $\pm$ 2.47	17.84 $\pm$ 2.41	1.57	.12
Randomness	14.28 $\pm$ 3.99	13.69 $\pm$ 4.03	-.76	.45
Benevolence of World	16.28 $\pm$ 2.86	16.16 $\pm$ 3.75	-.19	.85
Self-Worth	17.67 $\pm$ 3.45	17.31 $\pm$ 4.25	-.49	.63
Luck	11.85 $\pm$ 2.46	11.84 $\pm$ 3.18	-.03	.98
Controllability	13.52 $\pm$ 3.25	13.61 $\pm$ 3.28	.15	.88
Self-Controllability	16.50 $\pm$ 2.66	16.78 $\pm$ 2.33	.57	.57
Hardiness	103.93 $\pm$ 10.37	101.22 $\pm$ 14.31	-1.14	.26
Self-efficacy	31.05 $\pm$ 3.69	30.18 $\pm$ 3.75	-1.21	.23
Social support	54.63 $\pm$ 6.41	54.14 $\pm$ 9.04	-.33	.74
Self-deception	92.47 $\pm$ 11.83	91.47 $\pm$ 13.48	-.41	.68

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; † trend towards significance, N = 109

Table 4. *Non-significant gender differences across outcome measures*

	Females Mean ( $\pm$ SD)	Males Mean ( $\pm$ SD)	t	p
Overall Confidants' reactions to disclosure	7.04 $\pm$ 1.85	7.06 $\pm$ 1.65	.03	.98
Family's reaction	7.45 $\pm$ 2.20	7.15 $\pm$ 1.99	-.63	.53
Friend's reaction	7.00 $\pm$ 2.23	7.31 $\pm$ 1.59	.64	.52
Partner's reaction	6.74 $\pm$ 2.96	6.61 $\pm$ 2.11	-.17	.87
Professional workers	7.33 $\pm$ 1.93	7.00 $\pm$ 1.90	-.38	.71
Threat appraisals	17.65 $\pm$ 6.89	15.10 $\pm$ 7.06	-1.73	.09
Challenge appraisals	10.89 $\pm$ 7.01	11.87 $\pm$ 7.38	.64	.52
Loss appraisals	11.01 $\pm$ 5.02	9.81 $\pm$ 4.55	-1.16	.25
SSRQ stress score	194.60 $\pm$ 116.10	168.48 $\pm$ 100.19	-1.10	.27
HADS Depression	4.62 $\pm$ 3.44	3.81 $\pm$ 2.66	-1.20	.24
<i>WAS scores</i>				
Justice	12.45 $\pm$ 3.75	13.77 $\pm$ 3.45	1.70	.09
Benevolence of People	17.51 $\pm$ 2.52	17.23 $\pm$ 2.33	-.55	.59
Randomness	13.67 $\pm$ 4.07	14.90 $\pm$ 3.75	1.46	.15
Benevolence of World	16.31 $\pm$ 3.40	16.03 $\pm$ 2.97	-.39	.69
Self-Worth	17.15 $\pm$ 3.81	18.39 $\pm$ 3.76	1.53	.13
Luck	11.60 $\pm$ 3.01	12.45 $\pm$ 2.10	1.44	.15
Self-Controllability	16.56 $\pm$ 2.43	16.77 $\pm$ 2.74	.39	.69
Hardiness	105.10 $\pm$ 13.24	105.10 $\pm$ 9.36	1.28	.20
Self-efficacy	30.44 $\pm$ 3.67	31.23 $\pm$ 3.84	.99	.32
Social support	55.03 $\pm$ 7.83	52.87 $\pm$ 7.13	-1.33	.17
Self-deception	91.51 $\pm$ 13.22	93.29 $\pm$ 10.76	.67	.51

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ , N = 109

Appendix F: Ethical approval form and additional questionnaires for Study 2

Administrative documentation  
has been removed

### Posttraumatic Growth Inventory (PTGI)

Please look at the list of statements below and think about the stressful or upsetting event you described on the previous page. Please indicate if there has been a change in your attitudes or feelings since this event occurred. For the following questions, please write the most appropriate response using the scale below:

No change following my stressful event	Very small change	Small change	Moderate change	Great change	Very great change after my stressful event
--	----------------------	-----------------	--------------------	-----------------	---

0	1	2	3	4	5
---	---	---	---	---	---

1.		Knowing that I can count on people in times of trouble
2.		A sense of closeness with others
3.		A willingness to express my emotions
4.		Having compassion for others
5.		Putting effort into my relationships
6.		I learned a great deal about how wonderful people are
7.		I accept needing others
8.		I developed new interests
9.		I established a new path for my life
10.		I'm able to do better things with my life
11.		New opportunities are available which wouldn't have been otherwise
12.		I'm more likely to try to change things which need changing
13.		A feeling of self-reliance
14.		Knowing I can handle difficulties
15.		Being able to accept the way things worked out
16.		I discovered that I'm stronger than I thought I was
17.		A better understanding of spiritual matters
18.		I have a stronger religious faith
19.		My priorities about what is important in life
20.		An appreciation for the value of my own life
21.		Appreciating each day

### Pennebaker Inventory of Limbic Languidness (PILL)

Several common symptoms or bodily sensations are listed below. Most people have experienced most of them at one time or another. I am currently interested in finding out how prevalent each symptom is for you. Please indicate which (if any) of the listed symptoms you have experienced OVER THE PAST MONTH by placing a tick next to the items.

- |   |   |
|---|---|
| <input type="checkbox"/> Eyes water                             | <input type="checkbox"/> Swollen joints                           |
| <input type="checkbox"/> Itchy eyes or skin                     | <input type="checkbox"/> Stiff muscles                            |
| <input type="checkbox"/> Ringing in ears                        | <input type="checkbox"/> Back pains                               |
| <input type="checkbox"/> Temporary deafness or hard of hearing  | <input type="checkbox"/> Sensitive or tender skin                 |
| <input type="checkbox"/> Lump in throat                         | <input type="checkbox"/> Face flushes                             |
| <input type="checkbox"/> Choking sensations                     | <input type="checkbox"/> Tightness in chest                       |
| <input type="checkbox"/> Sneezing spells                        | <input type="checkbox"/> Skin breaks out in rash                  |
| <input type="checkbox"/> Running nose                           | <input type="checkbox"/> Acne or pimples on face                  |
| <input type="checkbox"/> Congested nose                         | <input type="checkbox"/> Acne/pimples other than face             |
| <input type="checkbox"/> Bleeding nose                          | <input type="checkbox"/> Boils                                    |
| <input type="checkbox"/> Asthma or wheezing                     | <input type="checkbox"/> Sweat even in cold weather               |
| <input type="checkbox"/> Coughing                               | <input type="checkbox"/> Strong reactions to insect bites         |
| <input type="checkbox"/> Out of breath                          | <input type="checkbox"/> Headaches                                |
| <input type="checkbox"/> Swollen ankles                         | <input type="checkbox"/> Feeling pressure in head                 |
| <input type="checkbox"/> Chest pains                            | <input type="checkbox"/> Hot flashes                              |
| <input type="checkbox"/> Racing heart                           | <input type="checkbox"/> Chills                                   |
| <input type="checkbox"/> Cold hands or feet even in hot weather | <input type="checkbox"/> Dizziness                                |
| <input type="checkbox"/> Leg cramps                             | <input type="checkbox"/> Feel faint                               |
| <input type="checkbox"/> Insomnia or difficulty sleeping        | <input type="checkbox"/> Numbness or tingling in any part of body |
| <input type="checkbox"/> Toothaches                             | <input type="checkbox"/> Twitching of eyelid                      |
| <input type="checkbox"/> Upset stomach                          | <input type="checkbox"/> Twitching other than eyelid              |
| <input type="checkbox"/> Indigestion                            | <input type="checkbox"/> Hands tremble or shake                   |
| <input type="checkbox"/> Heartburn or gas                       | <input type="checkbox"/> Stiff joints                             |
| <input type="checkbox"/> Abdominal pain                         | <input type="checkbox"/> Sore muscles                             |
| <input type="checkbox"/> Diarrhea                               | <input type="checkbox"/> Sore throat                              |
| <input type="checkbox"/> Constipation                           | <input type="checkbox"/> Sunburn                                  |
| <input type="checkbox"/> Hemorrhoids                            | <input type="checkbox"/> Nausea                                   |



## Appendix G: Study 2 information sheet and informed consent form

Administrative documentation  
has been removed



## Appendix H: Debriefing sheet for Study 2

Administrative documentation  
has been removed

## Appendix I

*Non-normal distributions of continuous data*

	Kolmogorov-Smirnov	<i>df</i>	<i>p</i>
<i>Pre-test</i>			
Age	.18	82	.0005
Challenge appraisals	.20	82	.0005
Loss appraisals	.15	82	.0005
Confidant reactions to disclosure	.10	82	.031
HADS Anxiety	.13	82	.002
HADS Depression	.18	82	.0005
Self-efficacy	.14	82	.001
Social support	.11	82	.002
PILL physical health problems	.16	82	.0005
<i>Post-test</i>			
Threat appraisals	.11	82	.01
Challenge appraisals	.18	82	.0005
HADS Anxiety	.12	82	.004
HADS Depression	.24	82	.0005
PILL physical health problems	.15	82	.0005
Self-efficacy	.12	82	.007
Posttraumatic growth	.11	82	.021

N = 90

## Appendix J

Table 1. *Non-significant gender differences across outcome measures at pre- and post-test*

	Females	Males	t	p
	Mean ( $\pm$ SD)	Mean ( $\pm$ SD)		
<i>Pre-test</i>				
Challenge appraisals	5.88 $\pm$ 4.43	7.31 $\pm$ 7.22	1.15	.33
Confidants' reactions to disclosure	6.93 $\pm$ 2.21	6.72 $\pm$ 2.45	-.41	.69
Posttraumatic growth	48.67 $\pm$ 22.37	40.52 $\pm$ 24.72	-1.56	.12
HADS Depression	3.66 $\pm$ 3.49	4.14 $\pm$ 2.96	.64	.52
PILL physical symptoms	13.25 $\pm$ 7.23	14.17 $\pm$ 9.15	.52	.60
Total WAS score	123.36 $\pm$ 12.90	127.48 $\pm$ 17.24	1.27	.21
Hardiness	104.10 $\pm$ 13.89	106.45 $\pm$ 12.43	.78	.44
Social support	54.11 $\pm$ 7.67	53.35 $\pm$ 7.60	-.45	.66
Self-deception	100.49 $\pm$ 13.97	103.75 $\pm$ 14.35	1.01	.31
<i>Post-test</i>				
Challenge appraisals	5.63 $\pm$ 3.93	7.93 $\pm$ 7.54	1.54	.13
Threat appraisals	10.75 $\pm$ 7.50	11.41 $\pm$ 8.50	.37	.71
Loss appraisals	9.51 $\pm$ 5.45	7.75 $\pm$ 5.29	-1.44	.15
HADS Anxiety	7.19 $\pm$ 3.22	6.28 $\pm$ 3.10	-1.28	.20
HADS Depression	3.93 $\pm$ 3.59	4.03 $\pm$ 3.45	.13	.90
PILL physical symptoms	13.05 $\pm$ 7.95	13.48 $\pm$ 10.41	.22	.83
Total WAS score	126.16 $\pm$ 13.18	126.14 $\pm$ 14.27	-.009	.99
Self-efficacy	31.16 $\pm$ 3.77	32.10 $\pm$ 3.23	1.15	.25
Hardiness	103.95 $\pm$ 13.95	104.41 $\pm$ 10.18	.16	.87

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ , N = 90

Table 2. *Non-significant differences across outcome measures at pre- and post-test in terms of marital status*

	Married/De-facto Mean ( $\pm$ SD)	Not in relationships Mean ( $\pm$ SD)	t	p
<i>Pre-test</i>				
Threat appraisals	17.53 $\pm$ 8.45	20.00 $\pm$ 6.48	.11	.13
Loss appraisals	11.76 $\pm$ 5.23	12.43 $\pm$ 4.36	.67	.51
Confidants' reactions to disclosure	6.79 $\pm$ 2.36	6.96 $\pm$ 2.20	.34	.73
HADS Anxiety	6.67 $\pm$ 3.36	7.21 $\pm$ 3.29	.78	.44
HADS Depression	3.59 $\pm$ 3.27	4.07 $\pm$ 3.42	.68	.50
Total WAS score	125.61 $\pm$ 12.58	123.59 $\pm$ 16.55	-.66	.51
Self-efficacy	31.10 $\pm$ 3.78	31.46 $\pm$ 3.83	.45	.66
Hardiness	105.04 $\pm$ 12.79	104.63 $\pm$ 14.28	-.14	.89
Social support	53.80 $\pm$ 7.68	53.95 $\pm$ 7.62	.10	.92
<i>Post-test</i>				
Challenge appraisals	5.71 $\pm$ 4.97	7.20 $\pm$ 5.92	1.29	.20
Loss appraisals	8.08 $\pm$ 5.41	10.00 $\pm$ 5.34	1.67	.10
Posttraumatic growth	57.53 $\pm$ 18.67	49.05 $\pm$ 23.70	-1.90	.061†
HADS Depression	3.59 $\pm$ 3.27	4.41 $\pm$ 3.79	1.11	.27
Self-efficacy	31.22 $\pm$ 3.33	31.76 $\pm$ 3.95	.69	.49
Hardiness	105.55 $\pm$ 12.15	102.37 $\pm$ 13.48	-1.18	.24

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; † trend towards significance, N = 90

Table 3. *Non-significant differences across outcome measures at pre- and post-test in terms of employment status*

	Employed Mean ( $\pm$ SD)	Not employed Mean ( $\pm$ SD)	t	p
<i>Pre-test</i>				
Threat appraisals	18.39 $\pm$ 7.45	19.26 $\pm$ 8.30	.42	.63
Challenge appraisals	6.30 $\pm$ 5.44	6.44 $\pm$ 5.68	.11	.91
Loss appraisals	12.49 $\pm$ 4.57	11.07 $\pm$ 5.38	-1.28	.21
Confidants' reactions to disclosure	7.16 $\pm$ 2.03	6.23 $\pm$ 2.67	-1.75	.08
Posttraumatic growth	44.59 $\pm$ 23.59	49.44 $\pm$ 22.79	.90	.37
HADS Anxiety	6.76 $\pm$ 3.35	7.29 $\pm$ 3.27	.69	.49
HADS Depression	3.73 $\pm$ 3.14	4.00 $\pm$ 3.78	.35	.73
Total WAS score	123.44 $\pm$ 14.42	127.59 $\pm$ 14.45	125	.22
Self-efficacy	31.51 $\pm$ 3.79	30.70 $\pm$ 3.79	-.92	.36
Hardiness	105.35 $\pm$ 11.83	103.70 $\pm$ 16.73	-.53	.60
Social support	53.84 $\pm$ 7.65	53.93 $\pm$ 7.66	.05	.96
Self-deception	101.73 $\pm$ 15.31	101.04 $\pm$ 11.03	-.21	.83
<i>Post-test</i>				
Threat appraisals	11.55 $\pm$ 8.27	9.63 $\pm$ 6.55	-1.07	.29
Challenge appraisals	6.90 $\pm$ 5.89	5.19 $\pm$ 4.07	-1.38	.17
Loss appraisals	9.16 $\pm$ 5.18	8.44 $\pm$ 6.05	-.57	.57
Posttraumatic growth	53.23 $\pm$ 20.79	54.67 $\pm$ 23.19	.29	.77
HADS Anxiety	6.76 $\pm$ 3.26	7.22 $\pm$ 3.06	.62	.53
HADS Depression	3.78 $\pm$ 3.34	4.40 $\pm$ 3.95	.78	.44
Total WAS score	125.35 $\pm$ 14.33	128.04 $\pm$ 11.17	.87	.39
Self-efficacy	31.67 $\pm$ 3.51	31.00 $\pm$ 3.88	-.80	.43
Hardiness	104.78 $\pm$ 11.90	102.52 $\pm$ 14.80	-.77	.45

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; † trend towards significance, N = 90

Table 4. *Non-significant differences across outcome measures at pre- and post-test in terms of education level*

	High school or less Mean ( $\pm$ SD)	Trade/TAFE Mean ( $\pm$ SD)	University Mean ( $\pm$ SD)	<i>F</i>	<i>P</i>
<i>Pre-test</i>					
Threat appraisals	19.21 $\pm$ 7.05	20.48 $\pm$ 7.71	16.50 $\pm$ 6.21	2.78	.07†
Challenge appraisals	7.05 $\pm$ 6.11	6.40 $\pm$ 5.80	4.91 $\pm$ 3.37	1.11	.33
Loss appraisals	11.35 $\pm$ 4.64	12.00 $\pm$ 5.01	13.54 $\pm$ 4.92	1.52	.23
Confidants' reactions	6.99 $\pm$ 2.06	6.68 $\pm$ 2.61	6.81 $\pm$ 2.38	.13	.87
to disclosure					
Posttraumatic growth	47.44 $\pm$ 24.66	45.96 $\pm$ 21.01	43.41 $\pm$ 23.98	.21	.81
PILL physical problems	13.42 $\pm$ 7.51	15.68 $\pm$ 9.68	11.36 $\pm$ 5.59	1.81	.17
HADS Anxiety	6.98 $\pm$ 3.43	7.12 $\pm$ 3.31	6.59 $\pm$ 3.24	.16	.85
HADS Depression	3.77 $\pm$ 3.47	3.64 $\pm$ 2.27	4.09 $\pm$ 4.10	.11	.89
Total WAS score	123.91 $\pm$ 15.37	123.84 $\pm$ 10.36	127.18 $\pm$ 16.85	.43	.65
Self-efficacy	30.70 $\pm$ 3.92	32.36 $\pm$ 3.01	31.14 $\pm$ 4.19	1.56	.22
Hardiness	103.44 $\pm$ 15.81	108.44 $\pm$ 6.87	103.55 $\pm$ 13.68	1.24	.29
Social support	52.79 $\pm$ 8.38	53.92 $\pm$ 7.47	55.91 $\pm$ 5.85	1.23	.30
Self-deception	101.52 $\pm$ 12.62	100.48 $\pm$ 17.11	102.68 $\pm$ 13.54	.12	.87
<i>Post-test</i>					
Threat appraisals	11.70 $\pm$ 7.56	10.33 $\pm$ 8.99	10.23 $\pm$ 7.08	.36	.70
Challenge appraisals	6.95 $\pm$ 5.64	5.42 $\pm$ 5.72	6.32 $\pm$ 4.77	.61	.55
Loss appraisals	8.83 $\pm$ 5.53	8.21 $\pm$ 4.92	9.95 $\pm$ 5.86	.60	.55
Posttraumatic growth	55.42 $\pm$ 20.55	49.76 $\pm$ 22.62	54.68 $\pm$ 22.62	.58	.56
PILL physical problems	13.95 $\pm$ 8.67	14.48 $\pm$ 9.92	10.23 $\pm$ 7.08	1.72	.18
HADS Anxiety	7.40 $\pm$ 3.37	6.72 $\pm$ 3.18	6.14 $\pm$ 2.78	1.19	.31
HADS Depression	4.21 $\pm$ 3.30	3.84 $\pm$ 3.54	3.63 $\pm$ 4.03	.21	.81
Total WAS score	126.23 $\pm$ 14.36	122.12 $\pm$ 11.26	130.59 $\pm$ 13.06	2.39	.10
Self-efficacy	30.84 $\pm$ 4.05	32.24 $\pm$ 2.80	31.82 $\pm$ 3.47	1.34	.27
Hardiness	102.33 $\pm$ 14.57	105.68 $\pm$ 9.66	105.77 $\pm$ 12.27	.79	.46

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; † trend towards significance,  $N = 90$



## Appendix K

Table 1. *Non-significant gender differences for changes in outcome measures over time (difference scores) for written-disclosure participants*

	Females	Males	t	p
	Mean ( $\pm$ SD)	Mean ( $\pm$ SD)		
<i>Difference scores</i>				
Challenge appraisals	-.69 $\pm$ 5.27	1.69 $\pm$ 4.89	1.48	.15
Loss appraisals	-4.62 $\pm$ 5.69	-2.94 $\pm$ 5.37	.97	.34
HADS Anxiety	-.89 $\pm$ 3.15	-.19 $\pm$ 1.97	.81	.42
HADS Depression	.24 $\pm$ 2.98	-.43 $\pm$ 1.50	-.85	.40
PILL physical symptoms	-3.10 $\pm$ 6.12	-4.31 $\pm$ 5.29	-.66	.51
Posttraumatic growth	12.48 $\pm$ 26.38	13.19 $\pm$ 12.38	.10	.92
Total WAS scores	5.34 $\pm$ 16.75	1.89 $\pm$ 7.14	-.78	.44
Self-efficacy	1.31 $\pm$ 3.39	-.25 $\pm$ 1.77	-1.70	.09
Hardiness	3.17 $\pm$ 11.58	-1.00 $\pm$ 7.09	-1.31	.20

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; † trend towards significance, N = 90

Table 2. *Non-significant changes in outcome measures over time (difference scores) for written-disclosure participants, in terms of marital status*

	Married/De- facto Mean ( $\pm$ SD)	Not in relationships Mean ( $\pm$ SD)	t	p
<i>Difference scores</i>				
Challenge appraisals	.10 $\pm$ 5.80	.27 $\pm$ 3.95	.10	.92
Loss appraisals	-4.57 $\pm$ 5.59	-2.93 $\pm$ 5.59	.92	.36
HADS Anxiety	-.73 $\pm$ 2.32	-.47 $\pm$ 3.64	.30	.77
HADS Depression	-.07 $\pm$ 2.59	.13 $\pm$ 2.59	.24	.81
PILL physical symptoms	-2.47 $\pm$ 5.70	-5.67 $\pm$ 5.60	-1.78	.08†
Postrumatic growth	12.17 $\pm$ 23.16	13.87 $\pm$ 21.04	.23	.81
Total WAS scores	2.93 $\pm$ 11.93	6.47 $\pm$ 17.92	.79	.43
Self-efficacy	.47 $\pm$ 2.40	1.33 $\pm$ 3.96	.91	.37
Hardiness	.93 $\pm$ 11.93	3.20 $\pm$ 14.91	.69	.49

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; † trend towards significance, N = 90

Table 3. *Non-significant changes in outcome measures over time (difference scores) for written-disclosure participants, in terms of employment status*

	Employed Mean ( $\pm$ SD)	Not employed Mean ( $\pm$ SD)	t	p
<i>Difference scores</i>				
Challenge appraisals	.81 $\pm$ 5.04	-1.46 $\pm$ 5.47	-1.34	.19
Threat appraisals	-7.25 $\pm$ 7.49	-10.62 $\pm$ 9.71	-1.25	.22
Loss appraisals	-4.56 $\pm$ 5.58	-2.69 $\pm$ 5.56	1.02	.31
HADS Anxiety	-.69 $\pm$ 2.84	-.54 $\pm$ 2.75	.16	.87
HADS Depression	-.28 $\pm$ 2.29	.69 $\pm$ 3.12	1.16	.25
PILL physical symptoms	-3.03 $\pm$ 6.15	-4.77 $\pm$ 4.83	-.91	.37
Postrumatic growth	11.47 $\pm$ 21.39	15.84 $\pm$ 24.88	.59	.55
Total WAS scores	5.69 $\pm$ 15.84	.23 $\pm$ 7.56	-1.18	.24
Self-efficacy	.72 $\pm$ 3.09	.85 $\pm$ 2.85	.13	.90
Hardiness	1.47 $\pm$ 11.70	2.23 $\pm$ 6.04	.22	.83

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; † trend towards significance, N = 90

Table 4. *Non-significant changes in outcome measures over time (difference scores) for written-disclosure participants, in terms of education level*

	High school or less Mean ( $\pm$ SD)	Trade/TAFE Mean ( $\pm$ SD)	University Mean ( $\pm$ SD)	<i>F</i>	<i>P</i>
<i>Difference scores</i>					
Challenge appraisals	-1.27 $\pm$ 5.69	.55 $\pm$ 2.70	2.42 $\pm$ 5.52	2.08	.14
Threat appraisals	-9.95 $\pm$ 9.50	-9.54 $\pm$ 7.07	-3.83 $\pm$ 4.91	2.50	.09
Loss appraisals	-3.86 $\pm$ 5.78	-4.09 $\pm$ 6.46	-4.25 $\pm$ 4.75	.02	.98
HADS Anxiety	.04 $\pm$ 1.78	-1.18 $\pm$ 2.89	-1.41 $\pm$ 3.94	1.36	.27
HADS Depression	.41 $\pm$ 1.94	.09 $\pm$ 3.21	-.83 $\pm$ 2.92	.92	.41
PILL physical symptoms	-2.22 $\pm$ 4.95	-5.63 $\pm$ 5.70	-4.00 $\pm$ 7.11	1.34	.27
Postrumatic growth	8.59 $\pm$ 23.98	14.54 $\pm$ 6.74	18.67 $\pm$ 23.49	.84	.44
Total WAS scores	3.45 $\pm$ 13.17	1.91 $\pm$ 6.70	7.33 $\pm$ 20.15	.46	.64
Self-efficacy	.32 $\pm$ .90	.36 $\pm$ 2.50	1.92 $\pm$ 3.48	1.25	.30
Hardiness	2.13 $\pm$ 7.63	-2.45 $\pm$ 8.38	4.67 $\pm$ 14.97	1.43	.25

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; † trend towards significance, N = 90

Appendix L: Ethical approval form and additional questionnaires for Study 3

**Administrative documentation  
has been removed**

## Appendix M: Standard measures for Study 3

**The World Health Organization Quality of Life Short Form (WHOQoL-BREF)**

	Not at all	Slightly	Somewhat	To a great extent	Completely
1. How would you rate your quality of life?					
2. How satisfied are you with your health?	Not at all	A small amount	Moderately	A great deal	An extreme amount
3. To what extent do you feel that physical pain prevents you from doing what you need to do?					
4. How much do you need any medical treatment to function in your daily life?					
5. How much do you enjoy life?					
6. To what extent do you feel your life to be meaningful?					
7. How often do you have negative feelings such as despair, anxiety, or depression?					
	Not at all	Slightly	Moderately	Very	Extremely
8. How well are you able to concentrate?					
9. How safe do you feel in your daily life?					
10. How healthy is your physical environment?					
11. How well are you able to get around physically?					
	Not at all	Slightly	Somewhat	To a great extent	Completely
12. Do you have enough energy for everyday life?					
13. Are you able to accept your bodily appearance?					
14. Have you enough money to meet your needs?					
15. How available to you is the information you need in your day-to-day life?					
16. To what extent do you have the opportunity for leisure activities?					
	Very dissatisfied	Dissatisfied	Neither satisfied or dissatisfied	Satisfied	Very satisfied
17. How satisfied are you with your sleep?					
18. How satisfied are you with your ability to perform daily living activities?					
19. How satisfied are you with your capacity to work?					
20. How satisfied are you with yourself?					
21. How satisfied are you with your personal relationships?					
22. How satisfied are you with your sex life?					
23. How satisfied are you with the support you get from your friends?					
24. How satisfied are you with the conditions of your living place?					
25. How satisfied are you with your access to health services?					
26. How satisfied are you with your transport?					

### The PTSD Checklist- Military Version (PCL-M)

Below is a list of problems and complaints veterans sometimes have in response to stressful or traumatic military related experiences. Please fill in the response that best represents how much you have been bothered by that problem in the past month.

	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Repeated, disturbing memories, thoughts, or images of a stressful military experience?					
2. Repeated, disturbing dreams of a stressful military experience?					
3. Suddenly acting or feeling as if a stressful military experience were happening again (as if you were reliving it)?					
4. Feeling very upset when something reminded you of a stressful military experience?					
5. Having physical reactions (eg. heart pounding, trouble breathing, sweating) when something reminded you of a stressful military experience?					
6. Avoiding thinking or talking about a stressful military experience, or avoiding having feelings related to it?					
7. Avoiding activities or situations because they reminded you of a stressful military experience?					
8. Trouble remembering important parts of a stressful military experience?					
9. Loss of interest in activities that you used to enjoy?					
10. Feeling distant or cut off from other people?					
11. Feeling emotionally numb or being unable to have loving feelings for those close to you?					
12. Feeling as if your future will somehow be cut short?					
13. Trouble falling or staying asleep?					
14. Feeling irritable or having angry outbursts?					
15. Having difficulty concentrating?					
16. Being 'super alert' or watchful or on guard?					
17. Feeling jumpy or easily startled?					

### The Alcohol Use Disorders Identification Test (AUDIT)

The following questions relate to alcohol use. Please fill in the appropriate response which corresponds to your answer. Please answer all questions- even if you do not currently drink alcohol.

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1. How often do you have a drink containing alcohol?					
Never	Monthly or less	2 to 4 times a month	2 to 3 times a week	4 or more times per week	

2. How many drinks containing alcohol do you have on a typical day when you are drinking?					
None	1 or 2	3 or 4	5 or 6	7 to 9	10 or more

3. How often do you have six or more drinks on one occasion?							
			Never	Less than monthly	Monthly	Weekly	Daily, almost daily

4. How often during the last year have you found that you were not able to stop drinking once you had started?					
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5. How often during the last year have you failed to do what was normally expected from you because of drinking?					
--	--	--	--	--	--

6. How often during the last year have you needed a drink in the morning to get yourself going after a heavy drinking session?					
--	--	--	--	--	--

7. How often during the last year have you had a feeling of guilt or remorse after drinking?					
--	--	--	--	--	--

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?					
--	--	--	--	--	--

9. Have you or someone else been injured as a result of your drinking?					
No	Yes, but not during the last year			Yes, during the last year	

10. Has a relative, friend or doctor been concerned about your drinking or suggested you should cut down?					
No	Yes, but not during the last year			Yes, during the last year	

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### ACPMH Dissociation measure

Please fill in the response that best describes how often in the past month you had these feelings and how strong they were if they occurred?

1. a) How much of the time in the past month have you felt out of touch with things going on around you, like you were in a daze?

Never	Once or twice	Once or twice a week	Several times a week	Daily, or almost every day
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b) How strong was this feeling of being out of touch or in a daze?

Not at all	Mild	Moderate	Severe	Extreme
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2. a) Have there been times in the past month when things going on around you seemed unreal or very strange and unfamiliar?

Not at all	Once or twice	Once or twice a week	Several times a week	Daily, or almost every day
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b) How strong were these feelings of unreality or strangeness?

Not at all	Mild	Moderate	Severe	Extreme
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3. a) Have there been times in the past month when you felt as if you were outside of your body, watching yourself as if you were another person?

Not at all	Once or twice	Once or twice a week	Several times a week	Daily, or almost every day
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b) How strong was this feeling?

Not at all	Mild	Moderate	Severe	Extreme
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## Appendix N: Study 3 information sheet and informed consent form

Administrative documentation  
has been removed



## Appendix O: Debriefing Sheet for Study 3

Administrative documentation  
has been removed

## Appendix P

*Non-normal distributions of continuous data*

	Kolmogorov-Smirnov	<i>df</i>	<i>p</i>
Pre-test scores			
WAS Benevolence in People	.13	65	.01
WAS Controllability	.13	65	.01
WAS Self-Controllability	.12	65	.02
Self-Efficacy scores	.14	65	.01
WHOQoL Physical health scores	.12	65	.03
HADS Anxiety	.12	65	.03
HADS Depression	.11	65	.04
Frequency of Dissociation	.11	65	.04
Post-test scores			
WAS Randomness	.12	64	.02
WAS Self-Controllability	.14	64	.005
Self-Efficacy scores	.13	64	.01
WHOQoL Social Relationship scores	.13	65	.01
AUDIT Alcohol Use scores	.14	65	.005

N = 65

## Appendix Q

*Variables that included missing data*

Percentage of missing data	Variable name
	Discharge
1.50 %	WAS Justice
1.50 %	WAS Benevolence of People
1.50 %	WAS Randomness
1.50 %	WAS Benevolence of the World
1.50 %	WAS Self-Worth
1.50 %	WAS Luck
1.50 %	WAS Controllability
1.50 %	WAS Self-Controllability
1.50 %	Total WAS Score
1.50 %	Hardiness score
1.50 %	Self-Efficacy score
1.50 %	Social Support score
1.50 %	Self-Deception score
N = 65	