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**Posttraumatic Stress and Posttraumatic Growth in
New Zealand Surf Lifesavers: An Analysis of Age, Gender,
Social Support, & Self-Efficacy**

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Abstract

Introduction. New Zealand surf lifeguards are exposed to a range of potentially traumatic events including search and rescue, trauma and medical care, and body retrievals. Although extensive training is required and peer support programmes are in place, little is known about the impact this work may have as there is a lack of published literature focusing on surf lifeguards. *Method:* A cross-sectional online survey was available to all current, paid and volunteer lifeguards, 17 years and older. Information was gathered on personal and surf lifesaving trauma exposure, posttraumatic stress symptoms, posttraumatic growth (PTG), perceived social support and perceived self-efficacy. Statistical analyses were performed to explore hypothesized relationships between these constructs and demographic variables. *Results:* A total of 181 lifeguards 17 years and older ($M = 26.96$, $SD = 12.45$), were included in the final analysis. Males reported significantly higher trauma exposure, yet females presented with higher posttraumatic stress symptoms. 7.8% of adolescents and 1.8% of adults scored above 40 on the PTSD measure suggesting probable PTSD. Adolescent participants reported both higher posttraumatic stress and PTG. Total trauma exposure, including surf lifesaving events, failed to show a significant relationship with trauma outcomes. However, personal traumatic events alone did show a small but significant relationship with both posttraumatic stress and PTG. The expected relationships between social support and self-efficacy with posttraumatic stress were not verified. Social support and self-efficacy did show a small but significant positive relationship with PTG. No moderation effect was found for either social support or self-efficacy. Exploratory analysis did show that age moderated the relationship between trauma exposure and both posttraumatic stress and PTG. *Discussion.* Results suggest that being younger may facilitate PTG but it may also make some vulnerable to posttraumatic stress symptoms under high trauma conditions. Traumatic events within Surf lifesaving were not related to trauma outcomes suggesting that personal trauma may have a stronger impact than lifeguard related trauma. The lack of evidence supporting the impact of social support and self-efficacy may be due to limitations in the measures used. Results and limitations are discussed with a focus on how this unique population could benefit from future research.

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1. Introduction

It is not uncommon to have experienced at least one traumatic event in one's life. Whilst some people may only be exposed to one or two personally traumatic events, those who spend their time in work or leisurely activities that place them in high-risk situations may be exposed to traumatic events on a regular basis (Berger et al., 2012). For those who work or volunteer in rescue or emergency organisations, experiencing crisis or trauma can be a regular occurrence. Research into the effects of exposure to traumatic events is well documented with Police, Firefighter, and Paramedic populations, showing evidence of posttraumatic stress and posttraumatic growth in response to trauma. Social support and self-efficacy are also well documented as showing main and moderating effects on trauma outcomes. There is however; a lack of research that considers trauma responses in New Zealand Surf Lifeguards. The generalizability of current trauma research with the surf lifesaving population is problematic, given the unique context of surf lifesaving and the young age distribution of New Zealand lifeguards.

The aims of the current study were to explore trauma exposure, posttraumatic stress and posttraumatic growth in New Zealand lifeguards. Given the extensive literature on the influence of perceived social support and perceived self-efficacy, these constructs were also measured to assess their relationship to trauma outcomes.

Chapter one discusses the relevant literature in relation to trauma exposure, posttraumatic stress, posttraumatic growth, social support and self-efficacy. Consideration is given to gender differences and age group comparisons given that these are common themes of vulnerability in trauma literature. The concepts of

resilience and recovery are also highlighted building a framework that incorporates the discussed trauma constructs.

Chapter two describes the Surf Lifesaving New Zealand organisation and current critical incident exposure practice. This is followed by an outline of the current study and study hypotheses.

Chapter three discusses in detail the methodological process, including research design, participant selection, ethical considerations, dissemination of the survey and statistical procedures. This is followed by a theoretical and psychometric review of each of the measures used.

Chapter four includes all of the study results, including data screening and correction methods, descriptive statistics, group comparisons, and correlational analyses, followed by the results of each hypothesis.

Chapter five is the discussion section, with hypotheses grouped together to cover wider theoretical constructs. The study limitations are then discussed with a focus on key areas of critique within the current study. This leads into a discussion of possible areas of future research to expand from the current study. A final conclusion summarises the key findings and contribution to current trauma literature.

2. Relevant Literature

Trauma Exposure

Janoff-Bulman (1992) conceptualizes trauma as a challenge to, or 'shattering' of one's fundamental assumptions about themselves and world around them. An individual's assumptions or belief schemas underlie all behaviour, emotion and cognition (Janoff-Bulman, 1992). When an individual experiences a traumatic event, their fundamental assumptions about themselves, the world, and their place in it are so severely challenged that they are broken down to a point where they can no longer organise and process their own thoughts, emotions, behaviours and the events around them (Janoff-Bulman, 1992). Their appraisal of the traumatic event (Lazarus & Folkman, 1984) is one of threat and stress, which can lead to the cognitive disintegration of their basic beliefs, resulting in more negative and threatening beliefs about themselves and the world around them (Janoff-Bulman, 1992).

The nature of the traumatic event and characteristics of the individual within their environmental context interact to result in the subjective experience of distress or trauma (Calhoun & Tedeschi, 1999). Trauma characteristics that are likely to result in higher levels of distress are events that are sudden and unexpected, out of one's control, and/or with deliberate or intentional harm caused by someone else (Calhoun & Tedeschi, 1999). The unexpected nature of a traumatic event takes away an individual's ability to prepare for the challenge ahead and to develop adaptive coping strategies (Calhoun & Tedeschi, 1999). Prolonged exposure to trauma can also add to levels of subjective distress, as coping strategies are less accessible and traumatized individual's come to realise the negative outcomes that have followed from the traumatic event (Calhoun & Tedeschi, 1999, 2013).

An individual's innate coping system is to engage in a process of denial or avoidance, and/or to experience intrusions in an attempt to understand and integrate their traumatic experience (Janoff-Bulman, 1992). Although these “symptoms” of trauma have at times been considered pathological, Janoff-Bulman (1992) makes a significant point that these “symptoms” may be understood as a normal reaction to an abnormal experience. Denial or avoidance functions to protect the individual, whilst intrusions are an attempt to conceptually process the event (Janoff-Bulman, 1992). The following section will expand on these processes of denial and experience of intrusions, as they present as posttraumatic stress disorder.

Posttraumatic Stress Disorder

The diagnosis of posttraumatic stress disorder (PTSD) requires an identifiable traumatic event as part of the diagnostic criteria, signifying an etiological pathway from trauma exposure to the symptoms of posttraumatic stress. Under the Diagnostic Statistical Manual - Fifth edition (DSM-5) developed by the American Psychiatric Association (APA, 2013; American Psychiatric Association, 2013), criterion A requires an individual to have experienced actual or threatened death, serious injury, or sexual violence; either personally, witnessing it as it happens to someone else, hearing that it has happened to a close family member or friend, or through repeated or extreme exposure to details of trauma (APA, 2013).

PTSD symptoms fit within 4 symptom clusters that are related to or represent some aspect of the traumatic event. These are, intrusion or re-experiencing symptoms, avoidance behaviours, maladaptive cognition and mood, and marked arousal and reactivity (APA, 2013). Symptoms must be present for at least one month and cause

clinically significant impairment to functioning. If full criteria are not met until 6 months after trauma exposure, PTSD is considered to have a delayed expression; if symptoms persist for less than one month then it is considered to be an Acute Stress Disorder (APA, 2013).

PTSD was first introduced in the Diagnostic Statistical Manual Third edition (DSM-3; American Psychiatric Association, 1981) and few changes have been made since. Shalev and Bremner (2016) highlight the influence of Vietnam War veterans on the development of PTSD criteria. Prior to the inclusion of PTSD in the DSM-III, the classic symptoms of PTSD have been recognized and debated for centuries, with significant social developments and challenges influencing the theoretical understanding of responses to trauma. In Part I of an extensive review of the history and development of PTSD, Lasiuk and Hegatoren (2010) outline the construction of PTSD prior to its inclusion in the DSM-III. During the nineteenth century industrial revolution in Britain, developments in railway transport led to a significant increase in public transport accidents, where responses to these traumatic events showed noticeable similarities to symptoms of hysteria. This followed on to soldiers returning from WWI with shell shock and “war neurosis.” By recognizing that the classic symptoms of PTSD could be attributed to an external event, there was a paradigm shift in the conceptualization of psychopathology from an internal biological etiology, to interpersonal and environmental causes. During the 1960’s psychoanalytic traditions began to waver, in favour of social and biological sciences. Concern for returning Vietnam Veterans during the 1970’s led to a resurgence of interest in trauma responses to war with veterans campaigning for governmental compensation. This was a major catalyst for the inclusion of PTSD in the DSM-III.

The DSM-III (APA, 1981) conceptualised a traumatic event as one that is outside the normal realm of human experience, in which almost anyone who is exposed to that trauma would be likely to develop PTSD. This was based on the assumption that for an event to be considered traumatic, it must instil a traumatic reaction in almost anyone. This has since been changed in the most recent edition, with the removal of the criteria “experiencing intense fear, horror, or hopelessness” in reaction to the threatening event (APA, 2013). This has shown the most dramatic change over successive editions with the DSM-5 allowing a more open criterion to the appraisal of potentially traumatic experiences. The term “potentially traumatic” is used throughout trauma literature to highlight the point that although there may be general consensus on the types of events that have the potential to be traumatic, not everyone will have a trauma response. The most recent changes also included the addition of three new symptoms; persistent and distorted blame of oneself or others, persistent negative emotional state, and reckless or destructive behaviour (APA, 2013).

Exposure to a traumatic event will not always result in the development of PTSD. Approximately 60% of men and 50% of women will experience at least one traumatic event in their lives (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), whereas the prevalence of PTSD in the general population ranges from 1.3-7.8% (e.g., Davidson, Hughes, Blazer, & George, 1995; Kessler et al., 1995; McLaughlin et al., 2015). Prevalence rates differ significantly depending on the country sampled. The World Health Organisation World Mental Health Survey (Koenen et al., 2017) found significant differences between high, middle, and lower income countries, in lifetime prevalence, 12 month prevalence, and 30 day prevalence of PTSD. High-income countries showed prevalence rates of PTSD that were more than double that of middle income and lower income countries. Prevalence rates in New Zealand (6.1% lifetime

prevalence, 3.8% 12 month prevalence) were comparable to the USA (6.9% lifetime prevalence, 4.3% 12 month prevalence) who showed the highest rates of PTSD. In comparison, Japan had a lifetime prevalence of 1.3% and 12 month prevalence of 1.2%. New Zealand prevalence of exposure to potentially traumatic events was also comparable to the USA (79.3% and 82.7% respectively).

Wilson (2004) conceptualizes PTSD as a prolonged stress response that consists of biological and psychological processes, which interact and influence each other to produce a set of symptoms that were not present before the trauma occurred. As a psychobiological response to trauma, the bodies normal homeostatic functioning that would normally return an individual's stress level to their baseline level, malfunctions (Wilson, 2004). An individual's baseline of normal functioning changes and the stress system is stuck in a process of allostasis (Wilson, 2004). This dysregulated system is in a constant state of stress, in which the sympathetic nervous system is performing at a higher level, which can be particularly damaging if the trauma is prolonged or repetitive (Wilson, 2004).

This is in line with the progressive sensitization model of PTSD which suggests that the central nervous system is sensitized and altered as a result of trauma exposure (Shalev & Bremner, 2016). A prospective study by Shalev and colleagues (2000) found that immediately after trauma exposure, participants showed no difference in their physiological responses to a startle caused by a loud noise. Differences in the physiological reactions of those who would later develop PTSD and those who did not develop PTSD, only became evident one month and four months after the initial trauma exposure. Those who would later develop PTSD showed a more exaggerated and sensitive startle response one month and four months after trauma exposure (Shalev et al., 2000).

Shalev and Bremner (2016) outline the neurobiological mechanisms that underlie the development of PTSD. The evident link between memory and stress response in the presentation of PTSD can be explained by the brain structures and neurochemical systems that are responsible for both stress responses and memory (Shalev & Bremner, 2016).

PTSD has been conceptualised as a disorder of recovery, due to the significant influence of post-trauma factors in the etiology of PTSD (Shalev & Bremner, 2016). A large meta-analysis of PTSD risk factors by Brewin, Andrews, and Valentine (2000), showed stronger evidence of post-trauma factors in the development of PTSD, over pre-trauma factors. Post-trauma factors included trauma severity, lack of social support, and additional life stress; pre-trauma factors included gender, personal and familial psychiatric history, and social, educational and intellectual disadvantage.

(Brewin et al., 2000). Although the authors note that there was significant variability across different studies, the effects of the personal and familial psychiatric history and childhood abuse remained fairly constant risk factors across studies. The significant impact of initial trauma exposure and subsequent life stress in this study highlights the vulnerable post-trauma environment of those with PTSD.

Many individuals who develop PTSD will only experience transient symptoms, with symptoms decreasing most rapidly within the first year (Shalev & Bremner, 2016). However, vulnerability to further traumatization and PTSD is high (Shalev & Bremner, 2016). The impact of repeated experiences of traumatic events has been referred to as cumulative trauma, and the subsequent impact on PTSD as the “building block” effect (Neuner et al., 2004; Schauer et al., 2003). The premise behind the “building block” effect is that repeated exposure to traumatic events increases the risk for developing and maintaining PTSD in a dose-response manner with increases in trauma exposure

resulting in increased probability of developing posttraumatic stress (Neuner et al., 2004). Measuring trauma exposure, as the number of different types of potentially traumatic events experienced is a valid approach, as it includes a wide range and variance of trauma exposure (Neuner et al., 2004). The number of event types is considered to be more accurate than the retrospective recall of the frequency of traumatic events in groups that may have had a high frequency of exposure to specific event types over time (Neuner et al., 2004).

Neuner and colleagues (2004) found evidence for the “building block” effect in their study of PTSD with West Nile refugees from Sudan and Uganda. The lifetime number of different types of events experienced correlated with total posttraumatic stress, as well as each PTSD subscale. The authors found the relationship between trauma exposure and posttraumatic stress was a near linear rise. They also found a cumulative trauma threshold, where regardless of the sample group, all participants who had experienced 28 or more traumatic event types developed the full set of posttraumatic stress symptoms. Although this is a high-risk population who have experienced many different types of traumatic events, this study suggests that there may be a threshold in other high-risk populations where regardless of resiliency or individual factors, anyone exposed to a high number of different event types will likely develop PTSD.

Cumulative trauma exposure has also been shown to decrease the likelihood of spontaneous recovery from PTSD without treatment. In a sample of Ugandan refugees, Kolassa and colleagues (2010) found that those who had experienced more different types of traumatic events were less likely to experience spontaneous remission from posttraumatic stress. With each additional event type experienced, there was an 8% decrease in the probability of spontaneous remission (Kolassa et al., 2010).

The cumulative effect of the number of traumatic event types experienced on posttraumatic stress has also been found in emergency services with Australian firefighters (Regehr, Hill, & Glancy, 2000) and paramedic trainees (Fjeldheim et al., 2014). Trauma exposure as measured by the frequency of fatal incidents attended, for a sample of firefighters also showed evidence of the cumulative effect of trauma exposure on PTSD with higher levels of trauma exposure being associated with higher rates of PTSD (Harvey et al., 2016).

There has been conflicting evidence for the cumulative impact of trauma exposure on posttraumatic stress. Some studies have failed to find a relationship between the level of trauma exposure and severity of posttraumatic stress using both the number of event types (Meyer et al., 2012) and event frequencies (Prati & Pietrantonio, 2010; Sattler, Boyd, & Kirsch, 2014). Discrepancies in studies may be due to differences in the conceptualisation and measurement of trauma exposure across different populations. This highlights the importance of focusing research on one particular trauma population. Given the risk of developing PTSD from cumulative trauma exposure and the nature of repeated exposure to potentially traumatic events in emergency service work, this population is of great interest as it offers the possibility of preventative action.

Rescue Workers and Posttraumatic Stress Disorder.

Rescue workers are routinely exposed to potentially traumatic events, as part of their role as first responders. Berger et al. (2012) defined a rescue worker as “any person who professionally or voluntarily engages in activities devoted to providing out-of-hospital acute medical care; transportation to definitive care; freeing persons or animals from danger to life or well-being in accidents, fires, bombings, floods,

earthquakes, other disasters and life-threatening conditions” (p. 1001). This places rescue workers in a unique position as frequently fulfilling criterion A. (exposure to a traumatic event) in the DSM-5 (American Psychiatric Association, 2013) and putting them at risk for the development of PTSD (Berger et al., 2012).

Rates of PTSD in emergency personnel range from 7% to 10% (Berger et al., 2012; Harvey et al., 2016). There is a lack of consensus in the trauma literature, on the effects of cumulative trauma and the risk of developing PTSD. Methodological differences and the wide variety of trauma measures used are likely to account for conflicting results. Some studies have found that neither the frequency of exposure to traumatic events (Prati & Pietrantonio, 2010; Sattler et al., 2014), nor the number of different types of trauma exposure (Meyer et al., 2012) were able to predict posttraumatic stress symptoms. Others have found a significant relationship between cumulative trauma exposure and posttraumatic stress symptoms in emergency service personnel (Fjeldheim et al., 2014; Harvey et al., 2016; Kehl, Knuth, Hulse, & Schmidt, 2015). A large meta-analysis by Ozer, Best, Lipsey, and Weiss (2008) found a small but significant weighted average correlation between prior trauma exposure and PTSD. In this study, prior childhood trauma and more recent adult trauma yielded the same effect size in relation to PTSD. Kehl and colleagues (2015) suggest that cumulative exposure to potentially traumatic events may be particularly difficult for emergency service personnel due to the responsibility felt to save lives and prevent harm to others. Not only are emergency service personnel exposed to these traumatic events, but there may be a sense of failure in the line of duty if someone is harmed, which can be even more traumatizing if the emergency worker has a personal connection to the person harmed (Kehl et al., 2015).

Emergency service personnel are a distinct trauma population. The presentation of PTSD in emergency services differs from the general population, further highlighting the importance of focusing research on a particular trauma group (Brewin et al., 2000).

Gender and Posttraumatic stress

Gender has frequently been identified as a possible risk factor for the development of posttraumatic stress disorder in community/civilian samples with women presenting with higher rates of PTSD than men (Brewin et al., 2000; Stein, Walker, & Forde, 2000; Tolin & Foa, 2006). Adolescent females' also present as higher risk for developing PTSD compared to adolescent males (Nooner et al., 2012). Neither the type of trauma commonly experienced by women nor the frequency of exposure to potentially traumatic events explains this apparent gender risk factor.

Although women are more likely to have experienced sexual assault in their childhood and adult lives, this does not appear to explain the significant gender differences observed (Stein et al., 2000; Tolin & Foa, 2006). When men and women were compared on the types of traumatic events more commonly experienced by men, women were still at a higher risk for developing PTSD (Tolin & Foa, 2006). Women in Stein and colleagues (2000) Canadian community sample were at higher risk for developing PTSD even when sexually related trauma was excluded from analysis.

The frequency of exposure to potentially traumatic events does not explain this relationship between gender and PTSD either. Although men tend to report experiencing more potentially traumatic events than women, women are still at a higher risk for developing PTSD (Stein et al., 2000; Tolin & Foa, 2006).

PTSD differences between men and women in community samples does not extend to military samples (Brewin et al., 2000; Sutker, Davis, Uddo, & Ditta, 1995) or

emergency service populations (Berger et al., 2012; Kehl et al., 2015; Pole et al., 2001; Prati & Pietrantonio, 2010; Sattler et al., 2014; Stephens, Long, & Miller, 1997) where gender differences disappear and men and women have comparable rates of PTSD.

The significance of population sample and trauma occupation is evident in a study by Lilly, Pole, Best, Metzler, and Marmar (2009) where comparisons between female civilians and female police officers showed that although female police officers reported higher exposure to potentially traumatic events, female civilians reported higher levels of posttraumatic stress symptoms. This suggests that females within the police may be more resilient to trauma exposure than their civilian peers.

Some possible explanations of this PTSD “gender equality” in military and emergency services are related to the personal characteristics of people drawn to this type of high-risk work, the social environment within these organisations, or the training involved to engage in these high-risk environments (Berger et al., 2012; Kehl et al., 2015).

The impact of trauma exposure, the unique nature of emergency service work, and the influence of gender are all significant factors in the development of PTSD. Being able to identify what puts some people at risk for developing PTSD can help with preventative efforts. It is also important to note that not everyone exposed to potentially traumatic events will develop PTSD. This highlights the importance of being able to identify what helps some people to remain relatively unaffected by potentially traumatic events. As Bonanno (2004) notes: “Dysfunction cannot be fully understood without a deeper understanding of health and resilience” (pp. 26).

Resilience and recovery

The concept of resilience is a complex, multidimensional construct with many contributing factors (Bonanno, Westphal, & Mancini, 2011). Bonanno (2004) defines resilience as the ability to maintain relatively normal psychological and physical health in the face of potentially traumatic events. A resilient individual may still experience some minor symptoms or distress, but this is usually transient and does not impact significantly on daily functioning (Bonanno, 2004). Bonanno (2004) cautions against interfering with the normal resiliency process as this can run the risk of pathologizing what is considered to be a normal response to an abnormal situation.

Resilience is considered to be conceptually different to the concept of recovery. A person in recovery will have experienced some functional impairment, with elevated psychopathology either at clinically significant levels or just below, that will gradually subside to pre-trauma levels over time (Bonanno, 2004; Bonanno et al., 2011). This trajectory of recovery can sometimes take up to 1 to 2 years and is open to intervention (Bonanno, 2004; Bonanno et al., 2011).

Bonanno and colleagues (2011) highlight personality, demographic variation, level of trauma exposure, social and economic resources, priori worldviews, and capacity for positive emotion, as factors that promote resilience. The authors note that these are relatively stable dimensions that do not allow much space, if any, for intervention. de Terte, Becker, and Stephens (2009) note that although they prefer Bonanno's definition of resilience over others, more dynamic factors that include community and social factors would be beneficial for understanding resilience and developing resilience enhancing programmes as they offer a point of intervention.

de Terte and colleagues (2009) developed a model of resilience, based upon the cognitive behavioural therapy model. Their model includes a dynamic interplay

between environmental, cognitive, emotional, behavioural and physical components in understanding resilience. This model was further evaluated in a longitudinal study of New Zealand police over a 10 year period (de Terte, Stephens, & Huddleston, 2014). A 3-part model best fit with this population with cognitive, environmental, and behavioural resiliency factors showing the strongest relationships with the outcome variables. A significant contribution to this model is the impact of specific sources of social support, with support from colleagues and supervisors showing negative relationships with posttraumatic stress symptoms and psychological distress. Social support fits under the environmental factor of the model. Cognitive components include optimism and adaptive coping. de Terte and colleagues suggest that self-efficacy may also be included as a cognitive component to resiliency based on Bandura's (1997) understanding that self-efficacy may be a precursor to the development of optimism.

Perceived Social Support and Posttraumatic stress

Social support is one of the most commonly studied constructs in the field of trauma research and posttraumatic stress. Social support is embedded in social relationships and has a strong influence on health and wellbeing (S. Cohen, Gottlieb, & Underwood, 2000; Janoff-Bulman, 1992).

There has been a divide in the social support literature, between the support that is actually received and an individual's perception of the availability of social support (Kaniasty & Norris, 1992; Norris & Kaniasty, 1996). Perceived social support has consistently predicted posttraumatic stress symptoms and has shown strong effects on the relationship between stress and posttraumatic stress (S. Cohen & Wills, 1985; Kaniasty & Norris, 1992; Norris & Kaniasty, 1996).

Perceived social support is hypothesized to buffer the impact of a stressful event through the appraisal process (Lazarus, 1966; Lazarus & Folkman, 1984). This stress appraisal can occur at two stages, the appraisal of threat, and the secondary appraisal of one's resources to cope (Lakey & Cohen, 2000). The stress buffering model, as applied to perceived social support outlines a process where the impact of an otherwise stressful experience is minimized or 'buffered' against due to an individual's belief that their support systems are available if needed (Lakey & Cohen, 2000; Thoits, 1986). The impact of this buffering effect will be stronger for individuals who are currently experiencing stress, and less effective for individuals not experiencing stress (Kaniasty & Norris, 1993; Lakey & Cohen, 2000). It is hypothesized that an individual who is experiencing a high degree of stress, who also has high levels of perceived social support will experience less posttraumatic stress symptoms than those under high stress with lower levels of perceived social support. This stress buffering is in line with the model of resilience, where the impact of a potentially traumatic event is minimized making the individual more resilient.

Hobfoll's Conservation Of Resources (COR) model explains that the experience of stress is due to either a loss of or threat to significant resources in one's life. These resources include objects, personal characteristics, energies (for example time or money), and conditions (for example marital status or employment) (Hobfoll, 1988). This model was developed within an ecological theory of stress, where the individual will work to protect or recover loss of resources, and this threat or loss is what leads to the experience of stress (Hobfoll, 1988). This ecological perspective considers different personal and social resources within the environmental context (Hobfoll, Freedy, Lane, & Geller, 1990). The substitution hypothesis explains how these resources and the environment interact, with resources from one area being able to compensate or replace,

lost or threatened resources from another (Hobfoll et al., 1990). For example, when environmental demands take a toll on personal resources, leaving an individual to struggle, social resources can compensate, minimising the impact of stress. This interdependence of personal and social resources also means that gains in one area may lead to gains in the other. However, if there is a significant loss in one resource this can lead into a downward spiral, resulting in a more significant loss in both areas of resources, particularly if the stress is chronic (Hobfoll et al., 1990).

Social support is considered one of the most valuable social resources that can compensate, support, and expand personal resources (Hobfoll, 1988; Hobfoll et al., 1990). In line with the stress-buffering theory (Lakey & Cohen, 2000; Thoits, 1986), under high stress when personal resources are being challenged or depleted, social support can have a significant impact on an individual's resource system and ability to cope (Hobfoll et al., 1990).

Social support is also shown to have a direct effect on posttraumatic stress symptoms, regardless of the level of trauma exposure. This is in line with the process of recovery (Bonanno, 2004; Bonanno et al., 2011). This may still happen through a secondary appraisal process (Lazarus & Folkman, 1984) as an individual evaluates their coping resources, after trauma exposure. Social support may facilitate recovery from trauma by offering a safe and supportive space for an individual to work through the cognitive-emotional processing required to evaluate and rebuild their assumptive world and to offer feedback on one's beliefs about the world and themselves in it (Janoff-Bulman, 1992). Recovery from trauma may also be explained by Hobfoll's (1988) Conservation of Resources theory. Significant declines in one resource can lead to a downward spiral in other resources. This may leave the traumatized individual with significantly depleted resources making them vulnerable to even low levels of trauma

exposure. Under even low levels of trauma exposure, social support may still have an effect on recovery, explaining the direct effect of social support on posttraumatic stress symptoms.

Perceived social support can be conceptualised as having different functions. Emotional or esteem support is the perception that one is valued, accepted, and cared for by others; instrumental support is the practical help or tangible aid that can be given by others; informational or appraisal support is the provision of information or knowledge that assists with coping or problem-solving; companionship is the availability of others to engage in leisurely and informal activities with (S. Cohen & Wills, 1985; Cutrona & Russell, 1990; Wills & Shinar, 2000).

Social support is a multidimensional construct (Cutrona & Russell, 1990) that has been studied with many different populations. Perceived social support has shown main effects on PTSD, significantly predicting posttraumatic stress symptoms in paramedic trainees (Fjeldheim et al., 2014), paid and volunteer firefighters (Sattler et al., 2014), police (Prati & Pietrantonio, 2010), and military veterans (Wilcox, 2010). For example, social support from family, friends and a significant other, significantly predicted posttraumatic stress symptoms in paramedic trainees, with higher levels of social support predicting lower levels of posttraumatic stress symptoms (Fjeldheim et al., 2014). Perceived social support has also shown significant buffering effects with police (Stephens & Long, 1999, 2000), survivors of a tsunami (Arnberg, Hultman, Michel, & Lundin, 2012), and female Vietnam veterans (Park, Wachen, Kaiser, & Mager Stellman, 2015). For example, the buffering effects of perceived social support were evident in a study with Swedish tourists returning from the 2004 Indian Ocean Tsunami that hit South East Asia (Arnberg et al., 2012). Those who experienced high levels of trauma, who also had lower perceived social support, had higher posttraumatic

stress symptoms compared to participants with higher levels of perceived social support.

Trauma survivors distinguish between different sources of social support, with different sources being perceived as more or less supportive. For example, male Vietnam veterans reported significantly higher levels of perceived social support from veteran peers and spouses, compared with non-veteran peers and family (Laffaye, Cavella, Drescher, & Rosen, 2008).

To determine the function of perceived social support as both a main effect and buffering effect, it is important to be able to identify what social support sources within an individual's social resources have the strongest impact on stress outcomes. For example, in the study with emergency service workers, perceived social support from a supervisor predicted posttraumatic stress symptoms, whereas co-worker perceived social support did not (Oginska-Bulik, 2013). Wilcox (2010) found that with male combat veterans, levels of PTSD were related to perceived social support from a significant other, family, and military peers, but not friends. Perceived social support can also differ within relatively similar populations. A longitudinal study comparing regular active duty soldiers and activated National Guard soldiers deployed to Iraq showed that unit support during deployment was significantly and inversely related to posttraumatic stress symptoms in active duty soldiers, but not National Guards (Han et al., 2014). Regehr, Hill, Knott, and Sault (2003) found that experienced firefighters had significantly lower levels of perceived social support from family and their employer, compared to newer recruits. In a stepwise regression analysis, length of time in employment and support from friends were significant predictors of posttraumatic stress symptoms (Regehr et al., 2003).

The buffering effect of perceived social support also differs between support sources. In a study with New Zealand police by Stephens and Long (1999), buffering effects were found with perceived social support from peers, whereas perceived social support from supervisors' and non-work sources only showed main effects. In another study by Stephens and Long (2000) with New Zealand police, perceived social support was assessed across different types of communication, at different levels, with different sources. Moderate levels of communication about traumatic experiences with peers buffered against traumatic stress. The only type of communication that showed a buffering effect from supervisor support was negative communication about work, at low and high levels of this kind of talk. Interestingly the opposite was found for negative talk with peers, which showed a buffering effect only at moderate levels of this kind of talk.

It is clear that social support has an important function in trauma resilience and recovery. There is value in identifying which sources of perceived social support have the strongest impact on posttraumatic stress symptoms for each unique population. The unique types of stressors experienced and the impact of this on personal and social resources requires different sources of perceived social support, to provide different levels of support to compensate any resource loss or threat (Hobfoll, 1988; Hobfoll et al., 1990). Different sources of social support also offer unique supporting spaces to process and work through trauma reactions (Janoff-Bulman, 1992).

Perceived Self-Efficacy and Posttraumatic Stress

Perceived self-efficacy is an individual's perception of their ability to cope with stressful demands and challenges, solve novel problems or perform difficult tasks, and

is reflected in their level of persistence and effort when faced with such difficulties (Bandura, 1997; Regehr et al., 2000; Schwarzer & Jerusalem, 1995). According to cognitive relational theory (Lazarus & Folkman, 1984), and social cognitive theory (Bandura, 1997), stress is the result of an interaction between biopsychosocial factors and the environment; an event is appraised as threatening if perceived to be beyond the capabilities of one's personal resources. This challenge to resources is in line with the conservation of resources theory (Hobfoll et al., 1990). Self-efficacy is considered a personal characteristic resource (Hobfoll et al., 1990) that can influence how an individual appraises a potentially traumatic event.

Self-efficacy can be applied at both the level of primary appraisal and secondary appraisal (Lazarus, 1966; Lazarus & Folkman, 1984). During the appraisal process, if an event is appraised as stressful, individuals high in self-efficacy are likely to perceive that event as a challenge, one that can be mastered perhaps with some degree of enjoyment (Jerusalem & Schwarzer, 1992). However, individuals low in self-efficacy are likely to appraise the event as threatening, leading to feelings of self-doubt and anxiety (Jerusalem & Schwarzer). Jerusalem and Schwarzer (1992) suggest that individual's low in self-efficacy have a heightened sensitivity to threat due to a history of failures in coping with threat.

Self-efficacy is hypothesized to regulate responses to stress via three possible functions; perceived cognitive control self-efficacy; perceived interpersonal self-efficacy; and perceived coping self-efficacy (Bandura, 1992; McCarthy & Newcomb, 1992). Cognitive control self-efficacy is the perceived ability to regulate and manage distressing emotions and cognitions in response to a traumatic event, including intrusive posttraumatic symptoms (Bandura, 1992; McCarthy & Newcomb, 1992). Perceived interpersonal self-efficacy is the belief in one's ability to develop and sustain personal

relationships, where perceived social support and perceived interpersonal self-efficacy have a bidirectional relationship (Bandura, 1992).

Coping self-efficacy (Bandura, 1992) or behavioural coping ability (McCarthy & Newcomb, 1992) is an individual's belief that they can actively influence their environment by reflecting on their own personal capabilities and resources and the demands placed by the environment. This perceived self-efficacy is active during the primary appraisal phase, as well as the secondary appraisal phase where an individual will assess whether to engage coping efforts and for how long to sustain this effort (Bosmans & van der Velden, 2015). Low levels of perceived coping self-efficacy can lead to avoidance behaviour, as an individual faced with a potentially stressful or traumatic event will appraise their coping efficacy as inept and unable to face the upcoming challenge (Bandura, 1992).

Coping self-efficacy has shown direct effects on posttraumatic stress symptoms in survivors of natural disaster. Core volunteers working 18 months after an earthquake in Indonesia who had low levels of posttraumatic stress symptoms, had higher perceived self-efficacy compared to volunteers who had higher levels of posttraumatic stress symptoms. Benight and Harper (2002) found that coping self-efficacy measured 2 months after severe fires and floods and one year later, predicted posttraumatic stress symptoms at both time points. Coping self-efficacy 2 months after the traumatic events also predicted posttraumatic stress symptoms one year later. Coping self-efficacy measured shortly after the event was also found to be a strong mediator between acute stress response shortly after the event and distress one year later.

Perceived self-efficacy has also proved to be a significant predictor of posttraumatic stress in firefighters. Regehr and colleagues (2003) found that perceived self-efficacy was negatively associated with posttraumatic stress symptoms. In this

study, more experienced firefighters showed lower levels of perceived self-efficacy compared to new recruits, and the length of time in the fire brigade showed a negative relationship to perceived self-efficacy. This suggests that age and time in service may have significant effects on self-efficacy. Heinrichs et al. (2005) found that firefighters' posttraumatic stress symptoms 2 years after completing their basic training were negatively correlated with perceived self-efficacy, and positively correlated with hostility, as measured immediately after basic training. Both self-efficacy and hostility assessed immediately after training, significantly predicted posttraumatic stress symptoms two years later, explaining 42% of the variance in posttraumatic stress symptoms. This longitudinal study was able to show that increases in stress symptoms occurred between 6 and 12 months after completing training. Heinrich and colleagues suggest that this is reflective of the increase in exposure to callouts of a more traumatic nature in which the fire brigade are testing their new member's eligibility for the job.

Trauma exposure in the emergency services is well documented. Surf lifesavers in New Zealand are a unique group of emergency service workers as nearly 80% of lifeguards are between the age of 14 and 18. The following section will discuss trauma exposure and posttraumatic stress in adolescence.

Trauma Exposure and Posttraumatic Stress Disorder in Adolescence

Adolescence is a particularly vulnerable time with regards to both trauma exposure and the subsequent development of posttraumatic stress symptoms. An extensive review of articles published between 2000 and 2011, that focused on adolescent exposure to trauma and posttraumatic stress, found that adolescents' were at greater risk of both being exposed to potentially traumatic events and developing PTSD,

compared to younger children and adults (Nooner et al., 2012). The average age of participants across studies was 15.9 years old. Although high rates of adolescents are exposed to traumatic events (70-80% of adolescents in the USA experienced one or more traumatic event), prevalence of PTSD is highly variable depending on the sample studied, ranging from 3% to 57% (Nooner et al., 2012). The average rate of PTSD in the studies reviewed was 13.6%. The types of trauma most commonly reported were witnessing violence, natural disasters, and physical abuse. Interestingly, natural disasters resulted in the lowest rates of PTSD (3%), compared to sexual trauma, which resulted in the highest rates of PTSD (57%). For events that were not specified, the rate of PTSD for those exposed to trauma was on average 10.6%. PTSD risk factors identified were; gender, with females being at greater risk for developing PTSD than males; age, with older adolescents being at greater risk; comorbid substance abuse or depression; and lower social support. Adolescents with PTSD were also more likely to attempt suicide, have a substance abuse problem, academic problems, and poorer physical health, than adolescents without PTSD (Nooner et al., 2012).

The peak during late adolescence for being at risk for developing PTSD is hypothesized to be due to immature cognitive, social and emotional capacities (Nooner et al., 2012). Nooner and colleagues suggest that although a child's cognitive, social and emotional capacities would be even less developed, older adolescents are exposed to more potentially traumatic events and engage in riskier behaviour, as their independence and autonomy develops. The hypothalamus-pituitary-adrenal (HPA) axis is a central neurochemical mechanism in the brain's intricate system that responds to stress and initiates the fight and flight response (Lupien, McEwen, Gunnar, & Heim, 2009). The HPA axis is also responsible for returning the stress response back to its set homeostatic point, reducing the experience of stress (Lupien et al., 2009). In the

developing stages of posttraumatic stress, this homeostatic set point is hypothesized to be altered resulting in the prolonged experience of stress and vulnerability to stress (Wilson, 2004). HPA axis reactivity is particularly sensitive during adolescence and is hypothesized to be due to increases in sex steroid levels (Lupien et al., 2009). The prefrontal cortex is also highly involved in the brain's stress response system and HPA axis reactivity, which in turn is responsible for the cognitive and emotional processing in response to trauma. As the prefrontal cortex is still developing throughout adolescence, the impact of stress can be particularly damaging on a system of cognitive and emotional functioning that is already underdeveloped (Lupien et al., 2009; Wilson, 2004).

Gan, Xie, Wang, Rodriguez, and Tang (2012) found a different resilience factor structure for adolescents who were exposed to high stress versus low stress in the context of a natural disaster. Youth in the low-stress group showed cohesive cognitive and emotional components of resilience with the two forming a single factor. Whereas resilient youth exposed to high-stress conditions showed more advanced cognitive development over emotional development, forming a two-factor structure of resilience. The authors suggest that during a time when cognitive development and resource accumulation is being formed, more resilient adolescents exposed to high levels of stress may mature more in regards to cognitive development. There was no significant difference in affect control between the two groups. This cognitive development may be related to protective factors of social support and self-efficacy as both are hypothesized to assist in the cognitive appraisal of threat and coping resources (Janoff-Bulman, 1992; Lakey & Cohen, 2000).

The importance of peers and family are particularly significant for adolescents during times of stress, as their assumptive world and newly formed beliefs and schemas

are particularly vulnerable to the impact trauma and the influence of others (Janoff-Bulman, 1992). On the one hand, a child's assumptive world is vulnerable to trauma, as it is not yet firmly established; on the other hand, it is more accommodating to alternative world views and the rebuilding of adaptive trauma narratives (Janoff-Bulman, 1992). This places significant weight on the influence of family and friends in the shaping of post-trauma beliefs and development of posttraumatic symptoms (Janoff-Bulman, 1992).

Main effects of perceived social support have been found for adolescents exposed to earthquakes (Xu & Yuan, 2014), and acts of terrorism (Schiff, Pat-Horenczyk, & Peled, 2010). Perceived social support has also shown moderating effects on the relationship between trauma exposure and posttraumatic stress symptoms for adolescents exposed to rainstorm related experiences (Zhen, Quan, Yao, & Zhou, 2016) and hurricanes (La Greca, Silverman, Lai, & Jaccard, 2010). In a longitudinal study by La Greca and colleagues, perceived social support from peers was found to buffer the impact of trauma on posttraumatic stress symptoms measured 9 months after a hurricane.

The importance of coping self-efficacy has also been studied with trauma-exposed adolescents. Whereas young children have not yet developed an understanding of their own capability, relying heavily on external guidance, adolescents' have begun to develop the cognitive self-reflective capacities to have a more grounded understanding of their own self-efficacy (Bandura, 1997). Adolescents' begin to develop increased responsibility and master new skills within the adult world (Bandura, 1997). The development of self-efficacy is based on past experiences and perceptions of successful mastery, which places adolescents at a particularly important stage of self-efficacy development (Bandura, 1997).

The influence of perceived self-efficacy on posttraumatic stress symptoms in adolescents' was shown in a study by Guerra, Cumsille, and Martínez (2014), where perceived self-efficacy assessed prior to exposure to an earthquake was significantly associated with posttraumatic stress symptoms 3 months after the trauma exposure, with self-efficacy showing a negative relationship with posttraumatic stress symptoms. The authors also found that the relationship between perceived self-efficacy and posttraumatic stress to be mediated by perceived fear response, with increased levels of self-efficacy, leading to a decrease in fear, resulting in lower levels of posttraumatic stress symptoms. Day and Kearney (2016) also found a significant inverse relationship between self-efficacy and posttraumatic stress in maltreated youth. Sense of mastery, which included self-efficacy, optimism, and adaptability, significantly predicted posttraumatic stress symptoms. Sense of mastery and a measure of sense of relatedness, together accounted for a significant amount of variance in posttraumatic stress symptoms, with increased sense of mastery and increased sense of relatedness predicting lower levels of posttraumatic stress. Adolescents in a war related trauma environment also showed evidence of the protective influence of perceived self-efficacy with higher levels of self-efficacy being associated with decreased posttraumatic stress symptoms (Pat-Horenczyk, Kenan, Achituv, & Bachar, 2014).

Posttraumatic growth

Although exposure to trauma has the inherent characteristic of distress, PTSD is not the only possible outcome. As Calhoun and Tedeschi (1999) note: "The ideas and writings of the ancient Greeks, Hebrews, and early Christians, and the teachings of

Buddhism, Hinduism, and Islam have all addressed the possibility of good coming from suffering” (p. 10). The idea that good can come from suffering requires a careful approach, as it can be misunderstood and seen as minimizing or disqualifying the distress and challenge people have faced (Calhoun & Tedeschi, 2013). Tedeschi and Calhoun (1996) coined the term ‘Posttraumatic Growth’ (PTG) to explain the positive changes people experience as a result of their struggle with a traumatic event. It is through this struggle with a traumatic event that an individual’s belief system or worldview is challenged and positively shifted from their pre-trauma state (Calhoun & Tedeschi, 1999; Tedeschi & Calhoun, 1996). This posttraumatic growth shift is considered to develop across 3 major life domains; a changed sense of relations with others; a changed sense of self; and a changed philosophy of life (Calhoun & Tedeschi, 1999).

A changed sense of relations with others: This is evident in the strengthening of bonds with others, feeling closer and more intimate with people in one's life (Calhoun & Tedeschi, 1999). There may also be a stronger sense of empathy and closeness to others who are suffering, particularly if that suffering is similar to that experienced personally (Calhoun & Tedeschi, 1999). Those individual’s that experience PTG are likely to recognise the need to reach out to people in their lives, appreciate the relationships they have, and feel more comfortable sharing their thoughts and emotions, resulting in stronger bonds with others (Calhoun & Tedeschi, 1999).

A changed sense of self: This highlights a paradox within trauma and PTG, whereby an individual may feel vulnerable, whilst at the same time feel stronger and more equipped to handle the challenges that come their way (Calhoun & Tedeschi, 1999). It is suggested that prior to trauma exposure, some individuals have an unrealistic view of the world and unrealistic expectations that they are and always will

be safe; unharmed by events that only happen to ‘other’ people (Calhoun & Tedeschi, 1999). This unrealistic view is challenged through an individual’s struggle with trauma and may lead to a newfound recognition of their ability to cope. As they develop a new sense of personal strength and their ability to work through the struggles that come their way, they are mindful of the dangers in their world and their own vulnerability (Calhoun & Tedeschi, 1999).

A changed philosophy of life: This covers an individual's general sense and appreciation for everything in their lives, particularly the small things, or things they have previously taken for granted (Calhoun & Tedeschi, 1999). Struggle with trauma can also bring to light, and challenge an individual’s spiritual, religious, and or existential belief system which is not necessarily strengthened, but is changed in some positive way for the individual (Calhoun & Tedeschi, 1999).

Joseph (2011) raised concerns regarding the inclusion of spirituality and religion in a measure of PTG. Joseph recognises that a change in religious or spiritual beliefs can be either positive or negative and that people who are not religious or spiritual may see a shift to religion or spirituality as a delusion. However, existential change within PTG is conceptualised as a positive shift, as evident in the wording of items. For example: “I have a better understanding of spiritual matters.” This is further supported by a qualitative study to assess the validity of the PTGI. Shakespeare-Finch and colleagues (2013) found that although few participants endorsed spiritual or religious change, there was consensus on the interpretation and understanding of the items.

PTG is a unique conceptualization of a positive trauma outcome, in that it is different to the concept of resilience and the ability to minimize the impact of trauma (Tedeschi & Calhoun, 2004). Resilience is conceptualized as the ability to stay relatively psychologically and physically stable when faced with significant adversity

(Bonanno, 2004). Whereas PTG necessitates a certain level of distress and struggle with a trauma that results in a fundamental shift; with adaptive and positive changes to an individual's worldview and belief system that is qualitatively different to the individual's pre-trauma state (Tedeschi & Calhoun, 2004). It is important to recognise that the presence of PTG does not deny the existence of some level of distress or even posttraumatic stress symptoms; the experience of distress is what leads to PTG in the first place (Calhoun & Tedeschi, 2013). Posttraumatic growth and posttraumatic stress symptoms are often correlated, with high levels of posttraumatic growth being associated with high levels of posttraumatic stress (Cieslak et al., 2009; Mystakidou et al., 2015)

Calhoun and Tedeschi (1998) use the metaphor of an earthquake to explain the process of PTG. An earthquake is a seismic event that creates turmoil and destruction to building structures. When buildings are severely damaged or destroyed they are then rebuilt, usually with a stronger more supportive structure, to withstand any future shakes. The buildings, in this case, are an individual's worldview, schema, or fundamental belief system that allows them to organise the world around them and their place within it. The earthquake is the trauma; a seismic event that destroys or shatters an individual's worldview, that has so severely challenged their basic belief system, they struggle to organise and process the traumatic event. Out of this destruction, an individual who is able to shift and change their fundamental belief system can rebuild their worldview in a way that can accommodate the traumatic event into their lives.

There is a dialectic process that underlies this stage, where an individual has to figure out what aspects of their lives and beliefs they need to change, and what they may need to accept. This relates to the paradox of PTG and trauma, where some positive changes occur, yet some acceptance of loss or damage must remain (Calhoun &

Tedeschi, 1999). The result of this is an individual who has made a positive shift through their struggle with a traumatic event.

Different populations sampled show different levels of growth in response to trauma. For example, trauma exposed college students reported a small degree of posttraumatic growth, compared to cancer patients' who reported on average a very great degree of posttraumatic growth as a result of their crisis (Cann et al., 2010). A study across 8 European countries looking at posttraumatic growth in firefighters found posttraumatic growth scores ranging from 8.40 to 24.59 (Kehl et al., 2015). This range is reflective of growth being experienced to a to a very small degree, up to a small to moderate degree.

Not only does the level PTG differ across different populations sampled, some gender differences have also been observed. However, the evidence for these differences is less conclusive than gender differences in PTSD.

Gender and Posttraumatic growth

The study of gender differences in posttraumatic growth has received less attention in the literature than gender differences in PTSD. Gender has shown to be unrelated to PTG in undergraduate students (Cann et al., 2010), a clinical sample of severely traumatized adolescents (Glad, Jensen, Holt, & Ormhaug, 2013), military veterans (Maguen, Vogt, King, King, & Litz, 2006), hurricane survivors (Cieslak et al., 2009), and firefighters (Kehl et al., 2015).

Some gender differences in PTG have been observed. The development of the Posttraumatic Growth Inventory (PTGI) showed evidence of a gender difference with

women tending to report more growth than men (Tedeschi & Calhoun, 1996). This was the case for every factor except for new possibilities. The largest gender differences were in spiritual or relationship changes reported by women (Tedeschi & Calhoun, 1996). A large meta-analysis of 70 studies by Vishnevsky, Cann, Calhoun, Tedeschi, and Demakis (2010) found small to moderate effect size of gender on PTG, with women reporting higher PTG than men. Another meta-analysis on PTG in cancer patients reflects this trend with a significant moderate association between female gender and PTG (Shand, Cowlshaw, Brooker, Burney, & Ricciardeli, 2015). Tedeschi and Calhoun suggest that higher rates of PTG in women may reflect a more significant impact of trauma on women and a greater ability to learn and take something positive from these traumatic experiences. This is suggested to be the result of women engaging in more purposeful rumination than men, stimulating the cognitive processes required to rebuild one's assumptive world (Janoff-Bulman, 1992; Tedeschi & Calhoun, 2004; Vishnevsky et al., 2010).

Resilience and Recovery in Posttraumatic Growth

Given the current definition of resilience as the ability to remain relatively unaffected by potentially traumatic events (Bonanno, 2004), theoretically resilience and posttraumatic growth are not compatible constructs, as the experience of posttraumatic growth necessitates some degree of trauma to be experienced (Tedeschi & Calhoun, 2004). If resilience factors are effective in the early stages of trauma, then the necessary degree of distress required for the shattering of one's fundamental assumptions will not occur. The concept of recovery is more in line with the concept of PTG. Perceived social support and self-efficacy may help facilitate PTG through the recovery stages of trauma.

Perceived Social Support and Posttraumatic Growth

Social support has also been studied in relation to trauma exposure and posttraumatic growth. The model of trauma outlined by Janoff-Bulman (1992) hypothesizes that the experience of trauma may lead to the shattering of one's fundamental assumptions about the world. What follows is a significant amount of cognitive activity whilst the traumatized individual attempts to make sense of and restructure their assumptive world (Calhoun & Tedeschi, 2013; Janoff-Bulman, 1992; Tedeschi & Calhoun, 2004). Initially, this cognitive activity presents itself as involuntary intrusions and negative rumination about the event that can be distressing and indicative of posttraumatic stress disorder (Calhoun & Tedeschi, 2013; Tedeschi & Calhoun, 2004). However, if the individual is able to shift into more deliberate rumination about the event, then there is an increased likelihood they will move away from their pre-trauma beliefs and schemas towards rebuilding their post-trauma worldview that incorporates aspects of the posttraumatic growth domains (Calhoun & Tedeschi, 2013).

It is common for individuals who have experienced trauma to feel the need to talk about the event and its consequences (Janoff-Bulman, 1992). This is often accompanied with an increased confidence in self-disclosure and intimacy with others (Tedeschi & Calhoun, 2004). Disclosure about positive aspects and outcomes of a traumatic event appears to have a positive relationship to deliberate rumination. Lindstrom, Cann, Calhoun, and Tedeschi (2013) found that trauma exposed college students who engaged in more positive disclosure reported more deliberate rumination soon after the traumatic event, compared to participants who did not engage in positive disclosure. Social support is hypothesized to facilitate posttraumatic growth by offering a safe and supportive environment for self-disclosure and a space for the rumination

needed to cognitively process the traumatic event (Calhoun & Tedeschi, 2013; Tedeschi & Calhoun, 2004). Supportive others can also offer insight into more adaptive ways of thinking about, and coping with, the traumatic event (Calhoun & Tedeschi, 2013).

Brooks, Lowe, Graham-Kevan, and Robinson (2016) found a significant positive relationship between social support and posttraumatic growth in trauma exposed students, survivors of violent crime, and trauma workers. Social support was also found to be a significant predictor of PTG in all three samples (Brooks et al., 2016). A recent meta-analysis by Shand et al. (2015) found a significant moderate association between social support and posttraumatic growth in cancer patients, where increased social support was associated with increased levels of posttraumatic growth, across 15 studies with a total of 23,656 participants.

Perceived Self-Efficacy and Posttraumatic growth

Theoretically and empirically, coping self-efficacy and its relation to posttraumatic growth has received less attention than self-efficacy and posttraumatic stress. Whilst self-efficacy is hypothesized to have a strong negative impact on stress during the appraisal of threat (Bandura, 1997; Jerusalem & Schwarzer, 1992), it is unlikely that self-efficacy has the same function for posttraumatic growth, as the experience of threat and stress is a necessary precursor to the development to posttraumatic growth (Calhoun & Tedeschi, 2013; Tedeschi & Calhoun, 2004).

According to social cognitive theory, bidirectional interactions between an individual, their environment, and behaviour, function through a feedback process (Bandura, 1997). Self-efficacy is considered a critical appraisal factor that functions at an individual level, as an internal process of self-evaluation (Bandura, 1997). It is hypothesized that individual's with high levels of perceived self-efficacy, will perceive

themselves as better able to cope with challenges, and to persist when faced with struggle (Schwarzer & Jerusalem, 1995), therefore better able to recognize that growth is possible (Bandura, 1997). Higher levels of perceived self-efficacy are likely to enhance growth by influencing the process of internal rumination and rebuilding of one's assumptive world (Janoff-Bulman, 1992; Tedeschi & Calhoun, 2004).

Lotfi-Kashani, Vaziri, Akbari, Kazemi-Zanjani, and Shamkoeyan (2014) and Mystakidou and colleagues (2015) found significant correlations between posttraumatic growth and self-efficacy in cancer patients. Lotfi-Kashani and colleagues found that perceived self-efficacy and perceived social support accounted for 20.7% of the variance in posttraumatic growth. In a study with Hurricane Katrina survivors also living with HIV, Cieslak and colleagues (2009) found that participants with high levels of posttraumatic growth also reported higher coping self-efficacy, as well as higher levels of posttraumatic stress. Pooley, Cohen, O'Connor, and Taylor (2013) found the same relationships in their study with Australians' affected by cyclones. This highlights the significance of continued distress to ensure cognitive processing persists throughout one's struggle with a traumatic event (Calhoun & Tedeschi, 2013; Tedeschi & Calhoun, 2004), with accompanying high levels of perceived self-efficacy facilitating this process towards posttraumatic growth.

Trauma Exposure and Posttraumatic Growth in Adolescence

It is evident from research with adult populations that increased exposure to trauma generally precedes posttraumatic growth, with some degree of stress being required to initiate the breakdown and rebuilding of fundamental beliefs. The same process appears to be evident for adolescents.

Glad et al. (2013) found evidence of posttraumatic growth in a sample of severely traumatized adolescents aged 10 to 18 years old. This group of participants recruited from mental health clinics showed perceived positive change across 3 distinctive themes; a sense of personal growth, changes in relations with others, and a changed philosophy of life. Prior to a treatment intervention, 15% of participants reported significant levels of posttraumatic growth. After the treatment intervention, this increased to 33%. Older participants were more likely to show posttraumatic growth than younger, which may be due to the significant cognitive appraisal involved in the development of posttraumatic growth. The authors also suggested that posttraumatic growth can be facilitated by targeting dysfunctional and disruptive thoughts, and through skill building, offering an environment that can help incorporate the traumatic experience into the traumatized youths new world view (Glad et al., 2013).

Similar to adults, this highlights the importance of social support and perceptions of self-efficacy for adolescents struggling with a traumatic experience. Although an adult's assumptive world is considered more solidified, and a child is considered more permeable and open to influence, adolescents' fit somewhere in the middle with peers being highly influential in an adolescents life (Janoff-Bulman, 1992). Peers are a significant point of reference to adolescents, offering an important source of social learning (Bandura, 1997).

Posttraumatic growth and posttraumatic stress are two distinct yet related trauma outcomes that can develop in both adolescents and adults, across a range of different populations. Evidence supporting the significance of perceived social support and perceived coping self-efficacy in influencing trauma responses suggests that these factors may be highly influential in a group of emergency / rescue workers across a wide age distribution. Surf lifeguards in New Zealand are potentially exposed to a range

of traumatic events that may result in PTSD and/or PTG. Research suggests that there are certain vulnerabilities and resiliency factors that may be useful to identify to help support this particular population. The following chapter will outline the Surf Lifesaving New Zealand organisation, the current study aims, and study hypotheses.

3. Current Study

New Zealand Surf Lifesavers

Surf Lifesaving New Zealand (SLSNZ) was established in 1910 and currently has 74 clubs around New Zealand, with approximately 17,000 members. To become an active lifeguard, members must be at least 14 years of age, go through rigorous training, and must pass the Surf Lifeguard Award exam. The organisation not only patrols New Zealand beaches and waterways, it also runs surf sports with members aged from 7 years old in the Junior Surf program, through to adults competing in surf sports overseas.

There is a lack of published literature that focuses on this particular population of emergency first responders. A search of 'surf lifesaving OR surf lifeguards OR surf lifesavers' on Scopus, a multidisciplinary search engine that includes the prominent psychology data base "psychINFO", came up with 104 results from 77 different journals. Search results were predominantly medically based. Others that appeared to have been related to the current field, upon further inspection were not relevant. One article looked at surf lifesavers perceptions of their own aerobic capacity and physical exercise compared to an objective measure of real aerobic capacity (Prieto, Nistal, Mendez, Abelairas-Gomez, & Barcala-Furelos, 2016). Another article focused on emergency management partnership between Australia surf lifesavers and paramedics (De Nardi, Wilks, & Agnew, 2005). One article related to job satisfaction among volunteer and paid emergency workers, but was not focused on surf lifesavers (Fallon & Rice, 2015). The addition of the search term "trauma" yielded no additional results.

The same search was repeated on the search engine “Discover” and resulted in 39,113 results. The addition of the search term ‘trauma’ resulted in 3 academic articles. One reporting on a new injury reporting system (Erby, Heard, & O’Loughlin, 2010), another was a letter to the editor of the journal regarding terminology use (Webber, Schmidt, Sempsrott, Szpilman, & Queiroga, 2017), and the third article was about rescue-boat related injuries (Yorkston, Arthur, Barker, Purdie, & McClure, 2005). An additional search on Discover for ‘surf lifesaving OR surf lifeguards OR surf lifesavers AND critical incidents’ came up with the same academic journal article by De Nardi and colleagues (2005) about emergency management partnership.

There is a clear lack of published psychological literature and little is known about what types of experiences surf lifeguards in New Zealand are exposed to, and how this might be affecting them. There are some similarities with other emergency first responders in the types of traumatic events lifeguards may experience (Sattler et al., 2014). However, there are some significant differences in this unique population. Surf lifeguards primary focus is on preventative efforts to keep a specified area of the beach safe. They can be involved in water and coast rescue efforts, body retrievals, resuscitation, and emergency medical care. Not only do lifeguards deal with individuals or groups who are in trouble, they are often needed to manage distressed family members or friends of those who have been hurt or lost. Lifeguards can also work alongside the police if required. Surf lifeguards are put through extensive training in order to qualify as an active duty lifeguard. They continually develop and maintain the skills necessary to perform tasks as a surf lifesaver. Surf lifesaving is a team effort that requires all members to work alongside and trust each other in highly stressful and potentially dangerous circumstances.

SLSNZ organisational guidelines for post critical incident management include the provision of a peer support worker trained within the organisation, to offer psychological first aid to affected members. Peer support workers are lifeguards themselves who volunteer to receive extra training to fill this role. This peer support program was based upon the M.A.N.E.R.S model of psychological first aid (Shave, 2010). Although the literature on critical incident stress management is lacking evidence-based models that have been appropriately evaluated through randomized control trials, psychological first aid is becoming increasingly favoured over the traditional critical incident stress debriefing method (Shave, 2010).

The M.A.N.E.R.S model was developed as a guideline and the applicability of each of the 6 components should be evaluated on a case-by-case basis (Shave, 2010). The model was developed by the Victorian Ambulance Counselling Unit (VACU, 2007; as cited in Shave, 2010). The 6 components include minimise exposure, acknowledge the event, normalise reactions, educate as required, restore or refer, and self-care. SLSNZ peer support workers are trained within this framework to offer psychological first aid, make an initial assessment for further referral, and to offer a peer based approach to support fellow lifeguards.

Each SLSNZ club is a community-based hub, with a strong focus on member wellbeing. Surf lifesaving peers, patrol captains and peer support workers are in a position to offer support to members within the organisation. The significance of peer support in high-risk organisations is receiving increased attention (Creamer et al., 2012). Creamer and colleagues developed guidelines for peer support in high-risk organisations that emphasizes the importance of developing tailored programmes for specific organisations to support their workers.

The Current study

This study is the first to explore trauma exposure and trauma outcomes in New Zealand Surf Lifesavers. It is widely recognised in the trauma literature that exposure to potentially traumatic events can lead to the development of posttraumatic stress symptoms as well as posttraumatic growth (Brewin et al., 2000; Cann et al., 2010; Fjeldheim et al., 2014; Harvey et al., 2016; Kehl et al., 2015; Neuner et al., 2004; Regehr et al., 2000; Shalev & Bremner, 2016; Tedeschi & Calhoun, 2004). However, it is important to note that not all emergency first responders experience psychopathology or growth in response to their work. It would be of great value to be able to identify what may help some members become more resilient to the impact of stress, what may help some cope, and what may help some recover.

An online survey advertised through a public Facebook post collected data on trauma exposure, posttraumatic stress symptoms and posttraumatic growth. Given the nature of surf lifesaving and the increased likelihood of being exposed to potentially traumatic experiences, protective and growth facilitating factors were explored. Perceived social support from a variety of sources and perceived coping self-efficacy were assessed to explore how these factors may be related to decreases in posttraumatic stress and increases in posttraumatic growth. Both perceived social support and perceived coping self-efficacy are dynamic factors that are open to intervention and therefore may inform surf lifesaving training and critical incident management.

This is a unique population of first responders with active lifeguards as young as 14 years of age. The majority of research on trauma and adolescence is based on trauma exposure from natural disasters, physical and or sexual abuse, and acts of terrorism. Research with emergency service personnel or first responders focuses exclusively on adults, as this type of work is usually restricted to adults.

It is hoped that this study will offer some unique insight into how best to support New Zealand lifeguards, and to initiate further research with this important group of first responders.

Study hypotheses

Hypothesis 1. Significant relationships among variables

- a.** The number of traumatic event types experienced will be positively related to both the level of posttraumatic stress symptoms and posttraumatic growth.
- b.** There will be a significant positive relationship between posttraumatic stress and PTG
- c.** There will be a significant negative relationship between perceived social support and posttraumatic stress.
- d.** There will be a significant negative relationship between perceived self-efficacy and posttraumatic stress.
- e.** There will be a significant positive relationship between perceived social support and posttraumatic growth.
- f.** There will be a significant positive relationship between perceived self-efficacy and posttraumatic growth.

Hypothesis 2. Gender Differences

- a.** There will be no gender differences in posttraumatic stress symptoms, in line with current trauma literature on emergency service populations.
- b.** Females will report significantly higher PTG than Males.

Hypothesis 3. Age Group Differences

- a.** Younger participants (17 to 19 years old) will have significantly higher posttraumatic stress symptoms compared to older participants.
- b.** Younger participants (17 to 19 years old) will have significantly lower PTG than older participants.

Hypothesis 4. Hierarchical Multiple Regression Analyses

- a. Social support and self-efficacy will predict posttraumatic stress symptom level after accounting for trauma exposure, age, and gender.
- b. Social support and self-efficacy will predict posttraumatic growth after accounting for trauma exposure, age, and gender.

Hypothesis 5. Moderation Effects

- a. Social support will moderate the relationship between trauma exposure and posttraumatic stress.
- b. Social support will moderate the relationship between trauma exposure and PTG
- c. Age will moderate the relationship between trauma exposure and posttraumatic stress.
- c. Age will moderate the relationship between trauma exposure and PTG.

4. Method

Research Design

This study was cross-sectional and quantitative, designed to explore the relationships between lifetime trauma exposure, and trauma outcomes in New Zealand surf lifesavers. Both posttraumatic stress and posttraumatic growth were assessed, alongside perceived social support and perceived self-efficacy to explore main and moderating relationships between variables. A total of 261 participants engaged in an online survey consisting of 84 to 104 items, depending on participant responses and follow up questions. The items included demographic variables and 5 psychometric measures. Participation was voluntary and anonymous. The survey was expected to take approximately 15 to 20 minutes to complete. To ensure anonymity and timely completion of the study, an online survey design was chosen in the hope that it may establish some grounding data and initiate more research to follow.

Participants

Participant selection: A convenience sample was selected through online snowball sampling via a public Facebook post. Snowball sampling is a word-of-mouth method of participant recruitment, where potential participants have the opportunity to pass on information about the survey, in an attempt to get their peers or acquaintances to participate. The ease of sharing content via Facebook allows participants to share information about the survey with their network of peers and colleagues. It is recognized that there is a degree of bias with this method of participant recruitment as only those with Internet access and Facebook will have the opportunity to participate, and those with larger Facebook friend groups will have a higher chance of exposure.

However, Kosinski, Matz, Gosling, Popov, and Stillwell (2015) suggest that the size and diversity of Facebook allows a large number of potential participants to be reached. The nature of the current study, focusing on an important group of first responders who have been largely neglected in the field of trauma research, suggests that potential participants may be personally invested in the study outcomes and therefore more motivated to participate and share with fellow surf lifesavers. Kosinski and colleagues suggest that this intrinsic motivation can outweigh any financial gain through compensation to participants' and will result in higher quality data. In a review of 109 studies that used Facebook for participant recruitment in a range of health and mental health studies, Thornton and colleagues found that a similarly representative sample was recruited via Facebook, as would have been through traditional research methods in 86% of the studies reviewed. They also found that this method was most common with studies involving young adults and adolescents.

Participant eligibility: Eligible participants included any paid or volunteer surf lifesavers, who worked during the summer of 2016 to 2017 and were 17 years or older at the time of data collection. As data collection occurred during the off-peak surf lifesaving season, current surf lifesavers were defined as those who worked during the most recent summer season of 2016 to 2017. Current lifeguards were selected as the target population to focus the study aims and allow a thorough investigation into current lifeguard wellbeing. Future studies would benefit from including analysis of ex-surf lifesavers.

The original survey information listed eligible participants as 16 years or older. Unfortunately, there was a missed error in the survey, which did not allow participants who were 16 years old to select their age, excluding them from participation. This error

was picked up two weeks into data collection. At this point large number of participants had already responded ($n = 150$) as well as 71 still being processed. It was decided to continue the survey as it was, including only participants' 17 years and over due to the high initial response rate. Advice from the survey developer also suggested that changing a survey once already uploaded and started could cause further errors. It is recognised that this is a limitation of the current study and future research would benefit from including younger participants.

Ethical Considerations

This study was evaluated by peer review and judged to be low risk. Low-Risk ethics approval was obtained on 22 May 2017 via the Massey University online risk assessment and recorded in the Massey University system (ethics notification number #4000017818). This is reported in the Annual Report of the Massey University Human Ethics Committee. Main ethical consideration included confidentiality and anonymity of participants, age and impact of trauma research, and cultural impact.

Participation was voluntary and completely anonymous. All raw data was kept under password protection with only the primary researcher and supervisor with access to the raw data. There is no personally identifying information in the survey.

Eligible participants were any current lifeguards 17 years and over. Younger surf lifesavers were omitted from this study due to ethical considerations of maturity to cope with recollecting traumatic events and current posttraumatic stress symptoms. Future research would benefit from including younger participants within a more supportive study framework. The information sheet informed potential participants of the nature of the study and that if any of the trauma or stress questions were too

distressing they were able to skip that question or the entire section. Information on where to seek support or help was offered in the information sheet, as well as at the end of the survey. This information included services that require payment, as well as free helpline options.

Ethnic identity information was collected for demographic purposes only and would not be used for comparative analysis. Cultural consultation with Margaret Kawharu, the Senior Maori Advisor at Massey University, helped to identify areas of concern, challenges, and assumptions made in the current study. Due to the nature of an anonymous online survey, a conscious decision was made to not include analysis or detailed discussion of cultural, social, language, religious and/or spiritual factors, that are inherently underlying many aspects of this study. It was decided that these complex factors require a more qualitative and careful approach to study, which cannot be adequately or safely held within this research framework. As this study is hopefully a starting place for further research with this population, anonymity and scope of participation was favoured over a more in depth qualitative approach.

Procedure

Basic information on the study and a link to the survey was presented in a Facebook post from the researcher's Facebook page on the 18th of July 2017 (See Appendix A. for the Facebook post). The official Surf Lifesaving New Zealand Facebook group shared the post, which was shared on by other clubs and individuals. The Surf Lifesaving New Zealand Facebook group has 14,666 followers and is one of the main sources of surf lifesaving related information for clubs around New Zealand. In the first 3 weeks, the post was shared 57 times. The post was re-shared again on the 8th of August, and each club with a Facebook page was contacted via a private message

inviting them to share the post in order to reach each surf lifesaving Facebook community. The post was shared for a final time by the researcher and SLSNZ on the 29th August 2017. The survey was live for a total of 9 weeks.

The Facebook post included basic information on what the study was about, participant eligibility, how long the survey was expected to take, and anonymity. It also informed participants of the option to go in the draw to win one of 10 \$40 Prezzy Cards as compensation for their time. Kosinski and colleagues (2015) suggest that offering a clear description of what is involved allows for participants' to be treated more like collaborators, rather than subjects.

The survey link included in the Facebook post directed participants to the information sheet and consent form (see Appendix B). Participants that indicated they were under 16 years old were directed to a page that explained the age eligibility and thanked them for their time. No further data was collected for these participants.

Upon completion of the survey, participants were given the opportunity to request a summary of the study once completed, and to go in the draw to win one of x10 \$40 Prezzy Cards.

Statistical Procedures

Data was collected online via the survey programme Qualtrics. It was then sent via a locked zip file and exported to 'Statistical Package for the Social Sciences' (SPSS) version 22 to be analysed. The data were screened for errors and missing data. Cases with significant missing data were deleted and the remaining replaced using Expectation Maximization. Chi-square tests were performed to compare demographic variables of those who attempted to complete the whole survey with those that did not. Cases that did not attempt the majority of the survey were deleted. Data was then screened for

univariate outliers and normality of distributions. Demographic information was analysed through the descriptive statistics function on SPSS. Chi-square tests were run to compare the current sample demographics with the Surf Lifesaving New Zealand organisation. Independent samples *t*-tests and one-way between-group ANOVA tests were performed to compare male and female participants, and young, middle, and older aged participants on variables measured. Correlational analyses using Pearson's Product Moment correlation coefficients were used to explore relationships between variables. Hierarchical multiple regression analyses and moderation analyses were used to explore the unique contribution of variables to trauma outcomes and the moderating effects of social support, self-efficacy and age.

The power of a statistical test is the probability of rejecting the null hypothesis (J. Cohen, 1988, 1992). Power is determined by the population effect size, sample size in each group, and alpha, which is the probability of falsely rejecting the null hypothesis (J. Cohen, 1988). You can ensure you will have sufficient power by calculating the number of participants required for each statistical test used. Cohen (1988) determined the sample sizes required with the standard level of power used in most statistical tests set at .80, with an alpha level of .05 for small, medium, and large effect sizes. Each test requires a different sample size (J. Cohen, 1992)

An independent samples *t*-test requires a sample size of 64 in each group to determine a medium effect size, with power at the .80 level and alpha at .05. The current study had 90 participants in each group comparison for the independent samples *t*-test. Correlational analyses with power at .80, alpha at .05 with a medium effect size required a sample size of 85. The current study sample size extends well beyond this. The Analysis of Variance (ANOVA) test required a sample size of 52 in each group, assuming equal sample sizes, to detect a medium effect size. The current study met

these conditions. Multiple regression analysis with 5 variables requires a sample size of 91 to detect a medium effect size, with power of .80 and alpha at .05. The current sample size exceeds this sample size requirement.

Psychometric Measures

Trauma exposure

Harkness and Monroe (2016) outline two key distinctions in the conceptualization of stress. Stress can be either an external environmental stressor or a subjective response to an external stressor. The authors highlight the importance of aligning the measure of stress with the theoretical construct it intends to measure. Assessing an individual's response to a traumatic event has little value when the context of the trauma is not understood (Harkness & Monroe, 2016). This implies that the assessment of an individual's perceived trauma exposure based on a subjective stress response offers little information on the types of experiences an individual has been exposed to. It is possible that if participants' only reported on experiences that resulted in a subjective stress response (for example posttraumatic stress symptoms), other potentially traumatic experiences that the individual was resilient to would be missed. In the context of resilience and the appraisal of threat, it is valuable to assess stress as external environmental stressors to ensure all potentially traumatic experiences are included. The term 'potentially' is the key, as not all potentially traumatic experiences will lead to a stress reaction; the difference is that there are other factors influencing trauma responses. This is the area of interest in this study.

Although the value of self-reporting checklists is considered secondary to the use of interviews in assessing exposure to potentially traumatic events, self-reporting methods have been used extensively in trauma research and offer a standardized method for collecting data (Harkness & Monroe, 2016). Wilker and colleagues (2015) suggest that retrospective assessment of trauma exposure is more reliable when assessed via a checklist of different types of potentially traumatic experiences, rather than the frequency of traumatic experiences. The nature of memory impairment and intrusive thoughts in posttraumatic stress disorder suggests that retrospective recollection of the frequency of traumatic events may influence an overestimation of traumatic experiences (Wilker et al., 2015). The authors found only a slight improvement in predicting current posttraumatic stress symptoms when event frequency and type of trauma exposure were included in the assessment, compared to the type of trauma exposure alone. Wilker and colleagues suggest that this slight improvement may reflect a genuine strengthening of fear memories that contribute to the development of posttraumatic stress, or current symptoms of posttraumatic stress are biasing retrospective recall. From this the authors suggest the use of event type checklists over event frequency ratings, as the potential risk of causing further stress from having to recollect the frequency of traumatic events, outweighs the minimal value of adding frequency into trauma assessment.

The Life Events Checklist for DSM-5 (LEC-5; Weathers, Blake, et al., 2013b) is a 16 item self report checklist that encompasses life time exposure to a variety of experiences that are likely to be perceived as traumatic, plus one item that assesses any other significantly traumatic event not included in the list. Participants are required to indicate on a check list whether a particular event has happened to them throughout their life time, either as direct personal exposure, witnessing the event, learning about it happening to a close family member or friend, or exposed to it as part of their job. In the

current study, “Exposed to as part of my job” was changed to “Experienced as part of surf lifesaving” to make this item more specific to the current population.

Although there is currently no psychometric data for the LEC-5, Weathers, Blake, et al. (2013b) suggest that since there are minimal changes between the original LEC and LEC-5, few psychometric differences are expected. The original LEC item 15 “Sudden, unexpected death of someone close to you” was changed to “Sudden accidental death” and the response category “Part of my job” was added by the authors (Weathers, Blake, et al., 2013b). This addition of “Part of my job” will allow for comparisons between personal trauma exposure and exposure through work in the current study.

Psychometric analysis of the original LEC was carried out with a large sample of undergraduate students and the second study with veterans (Gray, Litz, Hsu, & Lombardo, 2004). Test re-test reliability was shown to be relatively stable over a 7-day period for all items in direct exposure ($r = .82, p < .001$). Convergent validity was assessed with the Traumatic Life Events Questionnaire (Kubany et al., 2000) and revealed a total scale correlation of $r = -.55 (p < .001)$. Note that a lower score on the LEC indicates more direct exposure, hence the inverse relationship (Gray et al., 2004). The LEC and the Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000) also had similar correlations with the measure of posttraumatic stress (Pearson r coefficients ranging from $r = .34$ to $.48$). In the second study with combat veterans, correlation coefficients with the Posttraumatic Stress Disorder Checklist – Military version were $-.43 (p < .01)$, and with the Clinician Administered PTSD Scale for DSM-5 (CAPS; Weathers, Blake, et al., 2013a) $-.39 (p < .01)$. Gray and colleagues suggest that measures of internal consistency do not fit with reliability analysis of a trauma exposure measure, as it is not likely that the individual items would be related in any

way. Checking the temporal stability and the relationships between the trauma exposure measure and trauma outcomes is a more appropriate measure of reliability (Gray et al., 2004). The original LEC-5 items in the current study did significantly correlate with the measures of posttraumatic stress symptoms and posttraumatic growth.

An additional eight questions were added to the LEC-5 to include potentially traumatic experiences more specific to surf lifesaving. For example; body retrieval; successful resuscitation; unsuccessful resuscitation. This list was developed in consultation with the SLSNZ lifesaving services and education manager, and a senior lifeguard/clinical psychologist. The addition of these items to the original LEC-5 items does appear to affect the internal consistency as measured by its relationship to trauma outcomes (Gray et al., 2004). The LEC-Total (including surf lifesaving events) did not significantly correlate with posttraumatic stress ($r = .02$) or posttraumatic growth ($r = .07$). If participants indicated that they had experienced any of the additional surf lifesaving items, there were also able to indicate if they were under 18 years old and/or 18 or over at the time of exposure. Participants could select both age categories if they had experienced the event during both time frames. Although participants were all over the age of 16, this would give an indication of the types of critical incidents participants were exposed to whilst surf lifesaving when they were younger.

Posttraumatic stress

The Posttraumatic Stress Disorder Checklist-5 (PCL-5; Weathers, Litz, et al., 2013) is a 20 item self-report measure that is based on the DSM-5 criteria for a diagnosis of posttraumatic stress disorder (American Psychiatric Association, 2013). Although a structured clinical interview is considered the best way to diagnose

posttraumatic stress disorder, the PCL-5 has been shown to be a reliable and valid screening tool to offer a provisional diagnosis of PTSD (Weathers, Litz, et al., 2013). Participants are required to indicate on a rating scale from 0 (not at all) to 4 (extremely) how much they have been bothered by particular experiences or symptoms during the past month. This is in relation to the most distressing memory that the participant can recall. The initial psychometric evaluation was by Belvins, Weathers, Davis, Witte, and Domino (2015) with trauma-exposed college students. The PCL-5 showed strong internal consistency ($\alpha = .94$), test-retest reliability ($r = .82$), and convergent ($r_s = .74$ to $.85$) and discriminant validity ($r_s = .31$ to $.60$). In the current study, the Cronbach alpha coefficient was $.93$. The PCL-5 has shown strong psychometric validation across a range of populations, with established convergent and discriminant validity, and internal consistency ranging from $.90$ to $.96$ in veterans (Bovin et al., 2016; Wortmann et al., 2016), adolescents (Liu, Wang, Cao, Qing, & Armour, 2016), undergraduates (Belvins et al., 2015) and parents of children with burns (Sveen, Bondjers, & Willebrand, 2016). Test-retest reliability ranged from $r = .82$ over one week, and $r = .66$ to $.84$ over 3 to 6 weeks (Bovin et al., 2016; Sveen et al., 2016). Although the standard 4 factor structure has shown adequate fit to the data, a 7-factor hybrid factor structure is generally preferred, including re-experiencing, avoidance, negative affect, anhedonia, externalizing behaviour, anxious arousal, and dysphoric arousal factors (Belvins et al., 2015; Liu et al., 2016; Wortmann et al., 2016).

A tentative cut-off total score of 33 was first proposed by Weathers, Litz, and colleagues (2013), indicating probable PTSD, pending further psychometric validation. Comparative cut-off scores have been developed the PTSD Checklist-Specific (PCL-S) cut off scores, as this version is most similar to the PCL-5 (Weathers, Litz, et al., 2013). A more lenient PTSD cut off ranges from PCL-5 scores 25 to 31 to indicate probable

PTSD (Belvins et al., 2015; Wortmann et al., 2016). A cutoff score of 28 reflects a presumed prevalence of 16% in that population. A more conservative estimate cut-off score ranges from 37 to 39, indicating an estimated presumed prevalence of 10.3% (Belvins et al., 2015; Wortmann et al., 2016). Bovin and colleagues (2016) suggest that establishing a cut-off score alongside a structured clinical interview is the most reliable method. The authors found that a PCL-5 cut-off score of 31-33 indicated probable PTSD, based on the Clinician-Administered PTSD Scale for DSM-5 (Weathers, Blake, et al., 2013a) for their military sample. Wortmann and colleagues suggest a PCL-5 score of 23 for more lenient scoring, and a more stringent cut-off score of 42, as compared with the PTSD Symptoms Scale – Interview (Foa, Riggs, Dancu, & Rothbaum, 1993) for the diagnosis of PTSD.

Rates of PTSD in the general population range from 1.3-7.8% (Davidson et al., 1995; Kessler et al., 1995; McLaughlin et al., 2015), and are slightly higher for persons working in emergency services, ranging from 7-10% (Berger et al., 2012; Harvey et al., 2016). Based on Blevins and colleagues (2015) conservative cut-off score of 37, indicating a presumed prevalence of 10.3%, and Wortmann and colleagues (2016) stringent scoring of 42, a cut-off score of 40 will indicate probable PTSD in this study. A score of zero indicates no posttraumatic stress symptoms; a score of 1-19 indicates minor posttraumatic stress symptoms; 20 to 39 indicates moderate posttraumatic stress symptoms; 40 to 59 indicating probable PTSD and a high symptomology; 60-80 indicating extremely high levels of posttraumatic stress symptoms.

Posttraumatic growth

The Posttraumatic Growth Inventory – Short Form (PTGI-SF; Cann et al., 2010) is a 10 item self-report measure based on an original 21 item Posttraumatic Growth

Inventory (PTGI; Tedeschi & Calhoun, 1996), that measures an adaptive change in an individual's beliefs system as the result of their struggle with a traumatic event. The PTGI covers 5 domains of growth. 1). Greater appreciation of life and a changed sense of priorities. 2). Warmer, more intimate relationships with others. 3). A greater sense of personal strength. 4). Recognition of new possibilities or paths in one's life. 5). Spiritual and/or existential development (Tedeschi & Calhoun, 2004). The short form consists of two items from each of the 5 domains of growth, developed for use in clinical research so that time constraints and demand placed on participants are minimized (Cann et al., 2010). Participants are required to rate on a scale from 0 to 5, how much they have changed as a result of experiencing a trauma, in relation to each of the 10 items.

The total score Cronbach alpha coefficient, $\alpha = .86$ (Cann et al., 2010) is comparable to the original 21 item PTGI, $\alpha = .93$ (Tedeschi & Calhoun, 1996). In the current study, the Cronbach alpha coefficient was .88. Internal reliabilities of the subscale scores are acceptable (Cronbach alphas range from .68 to .80). The current study will not be analysing subscale scores. Cann et al. (2010) suggest the use of the PTGI-SF when total scores are preferred in analysis rather than subscale evaluations. The PTGI-SF also showed comparable results to the PTGI when evaluated with smaller clinically homogenous samples, who had experienced high levels of distress (Cann et al., 2010).

Average levels of PTG in trauma exposed individuals range from 20.61 in trauma exposed undergraduate students to 49.40 in Cancer patients (Cann et al., 2010). The range of possible scores is 0 to 50 as measured by the PTGI-SF, where a score of 50 would indicate that each of the 10 items is endorsed as having experienced this change to a very great degree as a result of one's crisis (Cann et al., 2010). This means that trauma exposed undergraduates and cancer patients indicated that they experienced

a change to a small degree and a very great degree respectively, as a result of their experienced crisis. On average, firefighters indicated that they experienced a change to a small degree as a result of their crisis (Armstrong, Shakespeare-Finch, & Shochet, 2014).

Social support

A 4-item measure of perceived functional social support that assesses both emotional and instrumental support, developed by Caplan, Cobb, French, Harrison, and Pinneau (1975) was applied across 5 sources of social support. Participants are required to answer each of the 4 questions for each source of support on a rating scale from 1 (very little) to 5 (a great deal). For example: How much does each of these people go out of their way to do things to make your work life easier? Not applicable was added to the rating scale, as it is possible that some participants would not have been in contact with every support source. This measure has been used in studies looking at work stress/strain (Beehr, King, & King, 1990; Ganster, Fusilier, & Mayes, 1986; LaRocco, House, & French, 1980) and also in a New Zealand context looking at Police exposure to trauma and PTSD (Addis & Stephens, 2008; Stephens et al., 1997) with coefficient alpha estimates ranging from .87 to .88. In the current study, Cronbach alpha coefficient was .87.

The original sources of social support included your immediate supervisor, other people at work, and your spouse or partner, friends and relatives (Caplan et al., 1975). ‘Your immediate supervisor’ was replaced with ‘patrol captain,’ as this is the senior lifeguard in charge each day. ‘Other people at work’ was replaced with ‘surf lifesaving peers.’ ‘Your spouse or partner, friends and relatives’ was split into ‘significant other’ and ‘family, whanau, friends.’ Finally, ‘peer support worker’ was added as a specific

critical incident support source that the organisation will send to a club when there has been a serious incident. These 5 sources of support were used to develop 5 subscales, with each item summed to create an index of social support for each source. Cronbach alpha coefficients in the current study for each subscale ranged from .79 to .91.

Self-efficacy

The Generalized Self-Efficacy Scale (GSES; Schwarzer & Jerusalem, 1995) is a 10 item self-report measure that assesses an individual's sense of self-efficacy in dealing with daily hassles and adapting to life after experiencing stressful life events. Participants rated on a scale from 1 (not at all true) to 4 (exactly true) how true each statement is for them. Total scores range from 10 to 40. It is suitable for participants over the age of 11, has been adapted to 28 languages, and used internationally with strong psychometric properties across different populations (Schwarzer & Jerusalem, 1995). Cronbach's alphas ranged from .76 to .90 across 23 nations (Schwarzer & Jerusalem, 1995). Cronbach alphas for the USA and Great Britain were .87 and .88 respectively (Scholz, Doña, Sud, & Schwarzer, 2002). In the current study, Cronbach alpha coefficient was .84. Validity was shown through correlations of the GSES with anxiety ($r = -.43$ for women and $r = -.42$ for men), with depression ($r = -.46$ for women and $r = .33$ for men), and optimism ($r = .60$ for women and $r = .30$ for men) (Scholz et al., 2002).

Schwarzer and Jerusalem (2013) do not suggest the use of specific cut off scores for the GESE to indicate self-efficacy. They do suggest that comparing scores to the distributions of a particular reference group could establish groups. The range of possible scores is 10 to 40. The composite scores in previous studies come close to normal distribution, with mean scores of 29.28 to 29.55, and standard deviations of 5.22

to 5.35 (Scholz et al., 2002; Schwarzer, Mueller, & Greenglass, 1999). A score of 10 would indicate very low perceived self-efficacy with each of the 10 items endorsed as “not at all true.” A score of 40 would indicate each of the 10 items was endorsed as exactly true. Mean scores of around 30 indicate that each of the 10 items was endorsed as moderately true.

5. Results

This chapter begins with the results from the data screening and correction methods, sample demographics, and an analysis of the generalizability of the sample. This is followed by gender and age group comparisons across each of the study measures and correlational analyses between measures. Finally, results from each of the study hypotheses are discussed.

Data screening and correction methods

Screening data for errors, missing data and checking violations of assumptions is a vital first step to analysing data as this can significantly impact the validity of results (Pallant, 2013).

Screening for errors: Data was first screened for any values out of the expected range for each measure through the *descriptive statistics* feature in SPSS. Values were in the expected range for all measures.

Missing data: It was found that 35.8% ($n = 101$) of the total sample ($n = 282$) had a significant proportion of their data missing, with the majority of these participants only completing the demographic information. If there is no evident pattern underlying missing data then it is considered to be Missing Completely At Random (MCAR) (Tabachnick & Fidell, 2013). Little's MCAR test (Chi-Square = 1001.03, DF = 1008, Sig. = .556) suggests that the data is missing completely at random. However, the percentage of missing data for each item ranged from 6.4% to 36.2% with visible sections of the survey missing data.

A Chi-square test was carried out to see if there were any significant differences between participants who completed the majority of the survey and those who did not

attempt the whole survey, in each of the categorical demographic variables (gender, occupation, paid/volunteer, region).

For the 2 by 2 table designs, the Continuity Correction value is reported as this is considered a more conservative value, accounting for the overestimate of the Chi-square value in 2 by 2 designs (Pallant, 2013). The demographic variable Gender was reduced to a two-category variable (male/female) excluding the third category (other) for analyses. There were only 2 participants who selected the gender category 'other', with one in each survey completion group. A Chi-square test for independence (with Yates Continuity Correction) indicated no significant association between gender and survey completion status, $\chi^2(1, n = 262) = 1.3, p = .25, phi = -0.08$, or between intention to continue surf lifesaving next year and survey completion status $\chi^2(1, n = 257) = .24, p = .63, phi = -.02$.

A Pearson Chi-square test for independence indicated no significant association between occupation (emergency service worker, student, other) and survey completion status, $\chi^2(2, n = 259) = 3.61, p = .16, phi = .12$, or region and survey completion $\chi^2(3, n = 253) = 1.00, p = .8, phi = .06$.

A Chi-square test for independence (with Yates Continuity Correction) indicated a significant association between work status (paid/volunteer) and survey completion status, $\chi^2(1, n = 256) = .5.61, p = .018, phi = -0.16$. The phi value of -.016 suggests that there was a small effect size (J. Cohen, 1988) of work status on survey completion status. Participants who completed the survey were more likely to be volunteers than paid lifeguards.

It was decided to delete the group of cases with significant sections of data missing, as missing data correction methods would not be reliable with large amounts of

data missing (Tabachnick & Fidell, 2013). The similarity in demographic presentation of the two groups supported this decision.

The final data set (N = 181) consisting of cases without significant chunks of data missing was then analysed to see if data were missing completely at random. Little's MCAR test (Chi-Square = 814.65, DF = 824, Sig. = .59) suggests that the data is missing randomly. Missing data analysis showed only 0.32% of values had incomplete data. As Tabachnick and Fidell (2013) suggest, any method for correcting missing data in a large data set with less than 5% of data points missing completely at random will be valid. Expectation Maximization was chosen to correct missing data.

Univariate Outliers: Extreme scores either side of the mean can lead to overestimation of population variance and lead to Type I and Type II errors (Field, 2013; Pallant, 2013). Converting data to z scores and finding values that are 3 standard deviations above or below the mean can help to identify outliers. In the current study this was done through a process called winsorizing (Field, 2013), where outliers were replaced with a score within 3 standard deviations above or below the mean. The PCL-5 had 2 outliers, the PTGI-SF, Social Support measure, and the LEC-5 each had one outlier.

Normality of data: All of the statistical procedures required to analyse this data assume that data is normally distributed. The skewness of a distribution indicates the symmetry, whilst kurtosis indicates the level of the distribution, with scores closer to 0 indicating a more normal distribution (Pallant, 2013; Tabachnick & Fidell, 2013). The Shapiro-Wilk and Kolmogorov-Smirnov statistic gives an indication of the degree of deviance from a normal distribution. However, in large sample sizes, the Shapiro-Wilk and Kolmogorov-Smirnov statistic is likely to show a significant difference indicating a non-normal distribution when it may in fact be normally distributed (Field, 2013). This

was evident with all measures having a significant Shapiro-Wilk and Kolmogorov-Smirnov statistic. Field suggests looking at the shape of the distribution in a histogram for larger samples.

The PCL-5 was clearly positively skewed with a skewness value of 1.3 and kurtosis value 1.2. The LEC-5 and PTGI-SF were both slightly positively skewed, both with skew values of 0.7 and kurtosis values 0.05 and 0.5 respectively. Social support was slightly negatively skewed with skew value -0.6 and kurtosis 0.1. GSES showed slight flatness with a kurtosis value -0.6 and skew 0.2. All histograms visually approximated normal distribution with the exception of the PCL-5 with a clear positive skew.

When data is grouped, the sampling distribution of means is evaluated, rather than the distribution of scores (Tabachnick & Fidell, 2013). The central limit theorem predicts that in large sample sizes, the distribution of sample means will reach normality, regardless of the shape of the sample distribution (Field, 2013; Tabachnick & Fidell, 2013). Even with heavy-tailed distributions, Field suggests that with a sample size of 100 to 160, statistics will remain robust against violations of normality. The current study (N=181) fits within these conditions. There is consensus that correlation analyses, t-tests and ANOVA will remain robust to violations of normality (Field, 2013), particularly with large sample sizes if there are at least 25 participants in each condition, it is 2-tailed, and you have equal sample sizes (Glass, Peckham, & Sanders, 1972; Howell, 2004; Pallant, 2013; Schmider, Ziegler, Danay, Beyer, & Buhner, 2010). For ungrouped data, Tabachnick and Fidell (2013) suggest transforming data that does not meet the assumption of normality, linearity and homoscedasticity. Data was transformed for the multiple regression and moderation analyses. This process is discussed in the following hypothesis results.

Descriptive statistics

Sample Demographics

The total sample consisted of 181 participants with a mean age of 27 years old (SD = 12.45). Almost half of the sample identified as male (49.7%) and half female (49.7%) with one participant (0.6%) indicating they were transgender. The remaining sample demographics are presented in Table 1.

Generalizability of Sample

Chi-square tests for goodness of fit were performed to compare the proportion of participants in each demographic variable with expected proportions based on current Surf Lifesaving NZ demographics. The proportion of males to females in the current study (50/50) was significantly different to the expected proportion, 58.6% male, 41.37% female; $\chi^2(1, n = 180) = 5.53, p = .02$. The proportion of participants over the age of 18 (80.7%) was significantly different to the expected proportion, 21.09%; $\chi^2(1, n = 181) = 385.98, p = <.001$. The proportion of participants under the age of 18 could not be compared as the current sample only includes participants who are 17 years old and the SLSNZ demographic information includes 14 to 17 years of age. There was a significant difference in the proportion of paid (29.4%) and volunteer (70.6%) participants compared to the expected proportion, 9.62% paid, 90.38% volunteer; $\chi^2(1, n = 180) = 35.25, p = <.001$. The Northern, $\chi^2(1, n = 177) = 1.37, p = .24$, Central, $\chi^2(1, n = 177) = 0.26, p = .61$, and Southern, $\chi^2(1, n = 177) = 1.74, p = .19$, regions did not significantly differ in the proportion of participants from those areas. The proportion of participants from the Eastern region (21.6%) did significantly differ from the

Table 1. Total number and percentage of participants within each sample demographic

Demographic	<i>n</i>	%
Ethnicity		
New Zealand Pakeha	170	93.8
New Zealand Maori	15	8.3
Pacific Island	2	1.1
Asian	2	1.1
Other	9	5.0
Missing	0	0
Total	181	100
Work Status		
Paid	53	29.3
Volunteer	127	70.2
Missing	1	.6
Total	181	100
Occupation		
Emergency worker	9	5.0
Student	84	46.4
Other	87	48.1
Missing	1	.6
Total	181	100
Intention to Continue		
Yes	167	92.3
No	4	2.2
Unsure	10	5.5
Missing	0	0
Total	181	100
Region		
Northern	68	37.6
Central	30	16.6
Eastern	39	21.6
Southern	40	22.2
Missing	4	2.2
Total	181	100

Note. *n* = number of participants. % = Percentage of total participants. Ethnicity = ethnic identification. Work Status = work status within surf lifesaving – paid or volunteer. Occupation = occupation outside of surf lifesaving. Intention to Continue = intention to continue surf lifesaving next season. Region = region of New Zealand currently as a surf lifeguard.

expected proportion, 26.52%; $\chi^2(1, n = 177) = 8.32, p = .004$. This suggests that the current results may not generalize to the general Surf Lifesaving New Zealand population.

Group Comparisons

The sample size, mean, standard deviation, and minimum/maximum scores are presented in Table 2. for the total sample and by gender for the 5 main measures, and again in Table 3. for the total sample and by age group comparisons. Extended tables with subscales are in Appendix C. Independent sample t-tests were carried out to compare males and females on each measure and one-way between groups analysis of variance (ANOVA) to compare means between young, middle and older age groups. Gender comparisons only included male and female participants ($n = 180$) excluding one participant from analysis who was transgender. There were an equal proportion of males to females in the current study ($n = 90$ in each group). The three age groups were chosen to divide the sample up into relatively equal sample sizes ($n = 69, 55, 57$, respectively) to ensure sufficient power, and to distinguish adolescence from young adulthood, and older adulthood. Homogeneity of variance was assessed for each comparison. The Levene's test was interpreted tentatively as it can often inaccurately indicate heterogeneity in large samples (Field, 2013). Howell (2004) suggests that if sample sizes are relatively equal, and the difference in variance is no more than 4 times that of each other than any heterogeneity is likely to be negligible. This method was chosen when the Levene's test was significant. The homogeneity of variance assumption was met for each of the tests below.

The effect size is reported for the independent samples *t*-test with *Cohen's d* where 0.2 indicates a small effect size, 0.5 a medium effect size, and 0.8 a large effect size (J. Cohen, 1988). Eta squared was calculated for the effect size in the ANOVA (Pallant, 2013) where an effect size of .01 is considered a small effect, .06 as a medium effect, and .14 as a large effect.

Table 2. Comparison of mean scores across each measure for males and females:
Descriptive statistics for measures with *t* test and effect sizes

Measure	<i>N</i>	Min – Max Score	<i>M</i> (<i>SD</i>)	<i>t</i>	<i>d</i>
LEC-Total					
Male	90	0-42	18.27 (10.74)		
Female	90	0-46	15.4 (8.82)		
Total	180	0-46	18.83 (9.82)	1.98*	.29
PCL-5					
Male	90	0-48	9.00 (10.12)		
Female	90	0-48	13.90 (12.06)		
Total	180	0-48	11.45 (11.37)	-2.96*	.44
PTGI-SF					
Male	90	0-43	15.71 (9.32)		
Female	90	0-48	17.61 (10.94)		
Total	180	0-48	16.66 (10.18)	-1.26	0.19
GSES					
Male	90	26-40	32.81 (3.48)		
Female	90	23-40	31.28 (3.80)		
Total	180	23-40	32.05 (3.71)	2.81	.42
SS					
Male	90	14-76	52.11 (13.16)		
Female	90	11-80	54.27 (14.75)		
Total	180	11-80	53.19 (13.98)	-1.04	.15

Note: LEC-5 = Life Events Checklist total (including surf lifesaving events). PCL-5 = Posttraumatic Stress Disorder Checklist-5. PTGI-SF = Posttraumatic Growth Inventory – Short Form. GSES = The Generalised Self-Efficacy Scale). SS = Social Support measure. Min – Max Score = minimum and maximum score for each measure in this study. *t* = *t*-test statistic for the difference between mean scores for males and females. * = *p* < .05, ** = *p* < .001. *d* = Cohen's *d*.

Gender comparisons. Independent samples *t*-tests revealed significant gender differences for 3 of the 5 primary measures, one of the trauma exposure subscales, and one of the social support subscales. Males experienced significantly more total trauma exposure (number of different types of traumatic events) than females, with a small effect size, *t* (178) = 1.98, *p* = .05, *d* = .29, males experienced significantly more surf lifesaving traumatic event types than females with a small to medium effect size, *t* (178) = 1.99, *p* = .048, *d* = .30, and had significantly higher perceived coping self efficacy compared to females, with a small to medium effect size, *t* (178) = 2.81, *p* = .006, *d* =

Table 3. Summary of descriptive statistics for measures with *F* test and effect sizes

Measure	<i>N</i>	Min – Max Score	<i>M</i> (<i>SD</i>)	<i>F</i>	η^2
LEC-Total					
Young	69	0-34	18.27 (10.74)		
Middle	55	4-46	15.4 (8.82)		
Old	57	3-42	18.89 (10.48)		
Total	181	0-46	16.78 (9.81)	6.19*	.07
PCL-5					
Young	69	0-48	14.39 (12.51)		
Middle	55	0-45	12.18 (11.80)		
Old	57	0-38	7.18 (7.69)		
Total	181	0-48	11.45 (11.34)	6.91**	.07
PTGI-SF					
Young	69	0-48	17.13 (11.40)		
Middle	55	0-47	16.45 (8.55)		
Old	57	0-43	16.63 (10.45)		
Total	181	0-48	16.77 (10.25)	0.07	.001
GSES					
Young	69	23-40	31.10 (3.79)		
Middle	55	24-39	31.68 (3.35)		
Old	57	26-40	33.68 (3.75)		
Total	181	23-40	32.09 (3.75)	8.53**	.09
SS					
Young	69	25-80	54.39 (13.22)		
Middle	55	15-80	55.63 (14.21)		
Old	57	11-76	49.11 (14.08)		
Total	181	11-80	53.10 (14.00)	3.62*	.03

Note: LEC-Total = Life Events Checklist total (including surf lifesaving events). PCL-5 = Posttraumatic Stress Disorder Checklist-5. PTGI-SF = Posttraumatic Growth Inventory – Short Form. GSES = The Generalised Self-Efficacy Scale). SS = Social Support measure. Min – Max Score = minimum and maximum score for each measure in this study. *F* = *F*-test statistic for the difference between mean scores for each age group. * = $p < .05$, ** = $p < .001$. η^2 = Eta squared.

.42. Females had significantly higher posttraumatic stress symptoms than males with a medium effect size, $t(178) = -2.96$, $p = .004$, $d = .44$, and significantly higher perceived social support from family/whanau/friends compared to males, with a small to medium effect size, $t(178) = -3.21$, $p = .002$, $d = .46$. All Cohen's d effect sizes were in the small to medium range.

Age group comparisons. One-way between-group analysis of variance (ANOVA) revealed significant differences in mean scores for the three different age groups in 4 of the 5 main measures and their subscales. The three age groups were young (17 to 19 years old), middle (20 to 26 years old), and older (27 years and over).

There were no significant differences in mean posttraumatic growth scores between the three age groups, $F(2) = 0.07$, $p = .930$, $\eta^2 = .001$. There was a statistically significant difference in the average number of different types of traumatic events experienced for the three different age groups, with a medium effect size, $F(2) = 6.19$, $p = .003$, $\eta^2 = .07$. Post-hoc comparisons using the Tukey HSD test indicated that younger participants experienced significantly less different types of potentially traumatic events than middle age and older participants. This trend was also observed when the original scale events, $F(2) = 6.72$, $p = .002$, $\eta^2 = .07$, and surf lifesaving specific events, $F(2) = 4.12$, $p = .018$, $\eta^2 = .04$, were analysed separately, with a lower effect size for the surf lifesaving specific events compared to the original scale events.

Of participants 20 years and older, 1.8% scored above the suggested cut off score of 40 on the PCL-5, whereas 7.2% of participants under the age of 20 scored above the cut off score indicating probable PTSD. Further analysis showed statistically significant differences in the level of posttraumatic stress symptoms, $F(2) = 6.91$, $p = .001$, $\eta^2 = .07$, perceived self-efficacy, $F(2) = 8.53$, $p = .000$, $\eta^2 = .09$, and perceived social support, $F(2) = 3.62$, $p = .029$, $\eta^2 = .04$, between each of the three age groups with effect sizes in the small to medium range. Post-hoc comparisons using the Tukey HSD test indicated that the mean PCL-5 score for older participants was significantly lower than younger and middle-aged participants; older participants had significantly higher perceived self-efficacy compared to younger and middle-aged participants; and

older participants had significantly lower perceived social support compared to middle age participants.

Analysis of the social support subscales for each of the three age groups revealed significant differences in social support from family/friends/whanau, $F(2) = 3.86, p = .023, \eta^2 = .04$, surf lifesaving peers, $F(2) = 7.91, p = .001, \eta^2 = .08$, and patrol captain, $F(2) = 7.38, p = .001, \eta^2 = .08$, in mean perceived social support across the three different age groups. Older participants reported significantly lower perceived social support from family/friends/whanau compared to younger participants. Older participants also reported significantly lower perceived social support from surf lifesaving peers compared to younger and middle-aged participants, and significantly lower support from the patrol captain compared to younger and middle-aged participants.

Correlational Analyses

Pearson's product moment correlations were computed to explore significant relationships between variables. A correlation coefficient (r) of .10 to .29 indicates a small effect size, .30 to .49 a medium effect size, and .50 to .99 a large effect size (J. Cohen, 1988). A correlation coefficient of 1 would indicate a perfect correlation. Table 4. shows the correlations between the main variables in this study. Pearson Product Moment correlations between main variables in this study showed small but significant correlations between LEC-Total and GSES ($r = .27$), PTGI-SF and SS ($r = .23$), PTGI-SF and GSES ($r = .20$), and a significant medium correlation between PCL-5 and PTGI-SF ($r = .34$). The remaining relationships were not statistically significant. Further correlational analyses were performed with social support subscales and the original trauma scale. See Appendix D. There were no significant correlations between any of

Table. 4. Pearson Product Moment Correlation for Primary Measures

Measure	1	2	3	4	5
1. LEC-Total	-				
2. PCL-5	.10	-			
3. PTGI-SF	.13	.34**	-		
4. SS	.03	-.06	.23**	-	
5. GSES	.27**	-.10	.20**	.12	-

Note. $n = 181$. LEC-5 = Life Events Checklist – 5 Total. PCL-5 = Posttraumatic Stress Checklist – 5 Total. PTGI-SF = Posttraumatic Growth Inventory Short Form Total. SS = Social Support Total. GSES = Generalized Self-Efficacy Scale Total. ** $p < .001$

the social support subscales and the PCL-5. There were small but significant correlations between PTGI-SF and all of the social support subscales ($r = .16$ to $.20$) with the exception of perceived social support from the Patrol Captain. The original LEC-5 items did show a small but significant correlation with both the PCL-5 ($r = .20$) and PTGI-SF ($r = .20$).

Hypothesis Testing

Hypothesis One: Significant Relationships

Pearson product-moment correlation coefficients were computed and analysed to examine the relationship between trauma exposure and trauma outcomes. The same procedure was repeated for hypothesis 3a to 3f. See Appendix D. for full correlational tables.

Hypothesis 1a: There will be a significant positive relationship between trauma exposure and trauma outcomes (PTSD & PTG).

The potentially traumatic events most commonly endorsed in the original LEC-5 were a natural disaster ($n = 73$) followed by a serious accident ($n = 45$), and other unwanted or uncomfortable sexual contact ($n = 42$). The surf lifesaving specific events most commonly endorsed were successful search for persons ($n = 89$), followed by complex life threatening rescue ($n = 63$), and traumatic injury requiring medical attention ($n = 55$).

Total Trauma Exposure (original LEC-5 items and surf lifesaving specific items) failed to show a significant relationship with posttraumatic stress symptoms ($r = .10$, $n = 181$, $p = .18$). There was, however, a small yet significant positive relationship between the original LEC-5 items and the PCL-5 ($r = .20$, $n = 181$, $p = .007$). Surf lifesaving events alone did not show a significant relationship with PCL-5 ($r = .02$, $n = 181$, $p = .77$).

Total Trauma Exposure also failed to show a significant relationship with PTGI-SF ($r = .13$, $n = 181$, $p = .08$). Similar to the relationship with PTSD, there was a significant but small relationship between the original LEC-5 and PTGI-SF ($r = .20$, $n = 181$, $p = .006$) but not the surf lifesaving specific events alone ($r = .07$, $n = 181$, $p = .34$). This suggests that trauma exposure associated with surf lifesaving specific events is not related to posttraumatic stress symptoms or posttraumatic growth in the current sample. This hypothesis was partially supported.

Hypothesis 1b: There will be a significant positive relationship between PCL-5 scores and PTGI-SF scores. There was a significant medium sized positive relationship between posttraumatic stress and posttraumatic growth ($r = .34$, $n = 181$, $p = .000$). This suggests that as posttraumatic stress symptoms increase, levels posttraumatic growth will also increase. This hypothesis was supported.

Hypothesis 1c: There will be a significant negative relationship between social support and PCL-5 scores. Although there was a negative relationship between social support and posttraumatic stress symptoms, this was an extremely small effect size that did not reach significance ($r = -.06, n = 181, p = .46$). None of the social support subscales showed a significant negative relationship to posttraumatic stress. This hypothesis was not supported.

Hypothesis 1d: There will be a significant negative relationship between self-efficacy and PCL-5 Scores. There was no significant relationship between self-efficacy and PCL-5 scores ($r = -.10, n = 181, p = .18$). This hypothesis was not supported.

Hypothesis 1e: There will be a significant positive relationship between social support and PTG. There was a small significant positive relationship between social support and PTG ($r = .23, n = 181, p = .002$). This hypothesis was supported. This relationship was consistent for 4 of the 5 social support subscales. Social support from a Patrol Captain was the only subscale that did not show a significant relationship to PTG ($r = .12, n = 181, p = .11$).

Hypothesis 1f: There will be a significant positive relationship between self-efficacy and PTG. There was a small yet significant positive relationship between self-efficacy and PTG ($r = .20, n = 181, p = .006$). This hypothesis was supported.

Hypothesis Two: Gender Differences

Hypothesis 2a: There will be no gender differences PCL-5 scores.

Independent samples *t*-tests were computed and analysed to compare mean scores on the PCL-5 for males and females. Females experienced significantly higher levels of posttraumatic stress symptoms than males, with a small to medium effect size, $t(178) = -2.96, p = .004, d = .44$. This hypothesis was not supported.

Hypothesis 2b: Females will present with significantly higher PTGI-SF

scores than males. The same analysis as hypothesis 1a was carried out with PTG as the dependent variable. Males and females did not have significantly different posttraumatic growth scores, $t(178) = -1.26, p = .21, d = .19$. This hypothesis was not supported.

Hypothesis Three: Age Group Differences

Hypothesis 3a: Younger participants (adolescents) will have significantly

higher PCL-5 scores than older participants. One-way between group analysis of variance (ANOVA) was computed. A significant difference between the age groups on the PCL-5 was evident indicating a medium effect size, $F(2) = 6.91, p = .001, \eta^2 = .07$. Post-hoc comparisons using the Tukey HSD test (Pallant, 2013) showed that younger (17 to 19 year old) and middle aged (20 to 26 year old) participants reported significantly higher posttraumatic stress symptoms compared to older participants (27 years and older). This hypothesis was supported.

Hypothesis 3b: Younger participants (adolescents) will have significantly lower PTGI-SF scores than older participants. The same procedure as hypothesis 2a was computed and analysed with PTG as the dependent variable. There were no significant differences in mean PTG scores for the three different age groups. This hypothesis was not supported.

Hypothesis Four: Hierarchal Multiple Regression Analyses

Checking violations of assumptions.

The assumptions of hierarchal multiple regression analyses were checked for violations with posttraumatic stress as the dependent variable and again with posttraumatic growth as the dependent variable. Independent variables included gender, age, trauma exposure, perceived social support and perceived self-efficacy. The sample size (N=181) exceeds the minimum sample size suggested by Tabachnick and Fidell (2013) for multiple regression with 5 independent variables. However as the dependent variable is skewed this minimum sample size may be underestimated and data may need to be transformed (Tabachnick & Fidell, 2013).

Assumptions for hierarchal multiple regression with posttraumatic stress as the outcome variable. The assumption of multicollinearity was not violated between the independent variables with all correlations below $r = .27$. This was supported by a tolerance statistic above .10 and VIF statistic below 10 (Pallant, 2013). However, correlations between the PCL-Total and social support ($r = -.06$), PCL-Total and self-efficacy ($r = -.10$), and PCL-Total and LEC-Total ($r = .10$) were below the suggested $r = .3$ correlation threshold suggested by Pallant (2013) suggesting that there is not a

strong relationship between the dependent variable and independent variables. Inspection of the scatterplot and the Mahalanobis distance values (16.97) compared with the critical value of Chi squared (18.47) suggests there are no problematic outliers. Assessment of normality, linearity, homoscedasticity, and independence of residuals was also assessed. Inspection of the Normal P-P Plot suggests deviations from normality. The scatterplot supports this failure of the normality assumption with a skewed distribution as well as possible violations of homoscedasticity (Tabachnick & Fidell, 2013). Following the general rule of thumb suggested by Howell (2004), sample variance of self-efficacy is more than 4 times that of the other measures, further supporting violations of homoscedasticity.

Assumptions for hierarchal multiple regression with posttraumatic growth as the outcome variable. Similar to multiple regression with posttraumatic stress as the outcome variable, multicollinearity was not violated between the independent variables with all correlations below $r = .27$, tolerance statistic above .10, and VIF below 10 (Pallant, 2013). Correlations between the PTG-Total and social support ($r = .23$), PTG-Total and self-efficacy ($r = .20$), and PTG-Total and LEC-Total ($r = .13$) were below the suggested $r = .3$ correlation threshold, again suggesting that the PTG is not strongly related to the independent variables. Inspection of the scatterplot and the Mahalanobis distance values (16.79) compared with the critical value of Chi squared (18.47) suggests that there are no problematic outliers. Inspection of the Normal P-P Plot was in a fairly straight line with only minor deviations suggesting a relatively normal distribution. Again the scatter plot suggests slight deviation from normality but possible violations of homoscedasticity (Tabachnick & Fidell, 2013). The sample variance of self-efficacy was more than 4 times that of the other measures, indicating violations of homoscedasticity (Howell, 2004).

Transformation. Failure to meet these assumptions suggests that some measures will need to be transformed to represent a more normal distribution to allow for multiple regression analysis (Pallant, 2013; Tabachnick & Fidell, 2013). Square Root transformation improved normal distribution for the PCL-Total, PTG-Total, and SE-Total. See Table 5. for skewness and kurtosis transformations. Square Root transformation of the PTG_Total did improve skewness yet did not improve kurtosis. It was still decided to transform this scale as Tabachnick and Fidell (2013) suggest, positive kurtosis has less of an impact in samples over 100. Social Support scale already had relatively good skewness and kurtosis (-.56, .13, respectively) and neither Square Root transformations nor Reflected Square Root transformations improved the distribution.

Violations of assumptions for multiple regression analyses were reassessed. The multicollinearity assumption was still held and there were no problematic outliers. Both P-P Plots showed improvement suggesting a closer to normal distribution. This was supported by the scatterplots suggesting that normality and homoscedasticity were present.

Hypothesis 4a: Social support and self-efficacy will predict PCL-5 scores after accounting for trauma exposure, gender, and age. Hierarchical multiple regression was used to assess the ability of perceived social support and perceived self-efficacy to predict posttraumatic stress symptoms, after controlling for the influence of trauma exposure, gender and age. Intercorrelations between variables are in table 6 and hierarchical multiple regression summary is in table 7. Gender was entered into step 1, explaining 5.4% of the variance in posttraumatic stress, age was entered into step 2, explaining 9.6%, trauma exposure at step 3, explaining 13.5%, social support at step 4,

Table 5. Distribution Transformations

Measure	Original	Square Root Trans.
PCL_Total		
Skewness	1.29	.10
Kurtosis	1.23	-.62
PTG_Total		
Skewness	.72	-.58
Kurtosis	.53	.73
SE_Total		
Skewness	.19	.07
Kurtosis	-.56	-.52
LEC_Total		
Skewness	.51	-.24
Kurtosis	-.37	.08

Note. Original = original scale distribution. Square Root Trans. = Square Root Transformation. PCL_Total = Posttraumatic Stress Check List -5 Total score. PTG_Total = Posttraumatic Growth Inventory Short Form Total. SE_Total = Generalized Self-Efficacy Total. LEC_Total = Life Events Checklist Total (including surf lifesaving events).

explaining 15.2%, and self-efficacy in step 5 explaining 15.9% of the variance in posttraumatic stress, $F(5,175) = 6.63, p = .001$. Variables were entered in this order to assess the unique and combined contribution of the predictor variables to posttraumatic stress. Age explained 4.2% of the variance in posttraumatic stress after controlling for gender, R squared change = .042, F change (1,178) = 8.17, $p = .005$. Trauma exposure explained 3.9% of the variance in posttraumatic stress after controlling for gender in step 1 and age in step 2, R squared change = .039, F change (1,177) = 7.93, $p = .005$.

Social support and self-efficacy did not account for a significant amount of variance after controlling for gender, age, and trauma exposure. In the final model, age ($beta = -.26, p < .001$) showed the strongest contribution to posttraumatic stress, followed by trauma exposure ($beta = .23, p < .002$), then gender ($beta = .16, p < .03$). Social support ($beta = -.12, p = .11$) and self-efficacy ($beta = -.09, p = .21$) did not make a significant contribution to the final model.

Table 6. Pearson correlation coefficients for variables in hierarchal multiple regression

Measure	1.	2.	3.	4.	5.	6.	7.
1. PCL-Total	-						
2. PTG-Total	.40**	-					
3. Gender	.24**	.08	-				
4. Age	-	-.004	-.38**	-			
	.28**						
5. LEC-Total	.12	.25*	-.12	-.25**	-		
6. SS - Total	-.07	.19*	.08	-.14	.02	-	
7. SE- Total	-.16*	.15*	-.21**	.27**	.26**	.15*	-

Note. $n = 180$. LEC-Total = Life Events Checklist total (including surf lifesaving events). PCL-5 = Posttraumatic Stress Disorder Checklist-5. PTG-Total = Posttraumatic Growth Inventory Short Form Total. SE = The Generalised Self-Efficacy Scale). SS = Social Support measure, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 7. Summary of hierarchal multiple regression analysis with Posttraumatic Stress as the outcome variable

Variable	β	R	R^2	ΔR^2
PCL-Total				
Step 1.		.23	.05	.05**
Gender	.23**			
Step 2.		.31	.10	.04**
Gender	.16*			
Age	-.22**			
Step 3.		.37	.14	.04**
Gender	.17*			
Age	-.26**			
LEC	.20**			
Step 4.		.39	.15	.02
Gender	.17*			
Age	-.28***			
LEC	.21**			
SS	-.13			
Step 5.		.40	.16	.01
Gender	.16*			
Age	-.26**			
LEC	.23**			
SS	-.12			
SE	-.09			

Note. $n = 180$. β = standardised regression coefficients. R = multiple correlation coefficients. R^2 = coefficients of determination. $\Delta R^2 = R^2$ change. * $p < .05$, ** $p < .01$, *** $p < .001$.

Hypothesis 4b: Social support and self-efficacy will predict PTGI-SF scores after accounting for trauma exposure, gender, and age. The same multiple regression analyses as hypothesis 4a was run with posttraumatic growth as the outcome variable to determine the ability of social support and self efficacy to predict posttraumatic growth after controlling for gender, age and trauma exposure. Intercorrelations between variables are in table 6 and the hierarchal multiple regression summaries in table 8. Gender was entered into step 1, explaining 1% of the variance in PTG, age at step 2 explaining 1.2%, trauma exposure was entered into step 3, explaining 7.5%, social support at step 4 explaining 10.1%, and self-efficacy at step 5 with 11.2% of the total variance explained by the model as a whole, $F(5,175) = 4.425, p = .001$. Gender did not account for a significant increase in variance ($R^2 = .010, R^2\text{change} = .010, p = .19$). Age did not explain a significant increase in variance after controlling for gender ($R^2 = .012, R^2\text{change} = .002, p = .56$). Trauma exposure explained an additional 7.5% of the variance in PTG after controlling for gender, and age, ($R^2 = .075, R^2\text{change} = .063, p = .001$). Social support explained 2.7% of the variance in PTG after controlling for gender, age, and trauma exposure ($R^2 = .101, R^2\text{change} = .027, p = .024$). Self-efficacy did not explain a significant increase in variance after controlling for gender, age, trauma exposure, and social support ($R^2 = .112, R^2\text{change} = .011, p = .14$). In the final model trauma exposure ($beta = .23, p < .003$) showed the strongest contribution to PTG, followed by social support ($beta = .15, p < .048$). Gender ($beta = .14, p = .08$), age ($beta = -.01, p = .90$), and self-efficacy ($beta = .11, p = .14$) did not make a significant contribution to the final model.

Table 8. Summary of hierarchal multiple regression analysis with Posttraumatic Growth as the outcome variable

Variable	β	R	R^2	ΔR^2
PTG-Total				
Step 1.		.10	.01	.01
Gender	.01			
Step 2.		.11	.01	.002
Gender	.12			
Age	.05			
Step 3.		.27	.08	.06**
Gender	.13			
Age	-.01			
LEC	.26**			
Step. 4		.32	.10	.03*
Gender	.13			
Age	.02			
LEC	.25**			
SS	.17*			
Step 5.		.34	.11	.01
Gender	.14			
Age	-.01			
LEC	.23**			
SS	.15*			
SE	.11			

Note. $n = 180$. β = standardised regression coefficients. R = multiple correlation coefficients. R^2 = coefficients of determination. $\Delta R^2 = R^2$ change. * $p < .05$, ** $p < .01$, *** $p < .001$.

Hypothesis Five: Moderation analyses

Hierarchal multiple regression analyses were performed to assess the moderating effect of social support and self-efficacy on the relationship between trauma exposure and trauma outcomes (posttraumatic stress and posttraumatic growth). Additional moderation analyses were performed to investigate whether age would moderate the relationship between trauma exposure and trauma outcomes.

Transformations and moderation analysis was performed following the process outlined by Hayes (2013). Square root transformations for LEC Total, PCL Total, PTG

Total, and Self-Efficacy total were used in all of the moderation analyses to ensure normal distribution. The un-transformed Social Support total was already normally distributed. Centralised variables were computed for the LEC Total (square root), Self-Efficacy Total (square root) and Social Support total to correct multicollinearity and to ensure the scale of Self-Efficacy was interpretable as this scale ranged from 1 to 4 units (Hayes, 2013). Hierarchical multiple regression analyses were performed to assess the moderating effect of social support and self-efficacy on the relationship between trauma exposure and trauma outcomes (posttraumatic stress and posttraumatic growth). An interaction term was created for each moderation analysis by multiplying the independent variable with the moderating variable, for example trauma exposure x social support. By including this interaction variable into a multiple regression equation it allows you to look at the conditional effects of the independent variable and moderator variable on the outcome variable (Hayes, 2013).

Hypothesis 5a: Social support will moderate the relationship between trauma exposure and PCL-5 scores. LEC Total was entered at step one and Social Support Total entered at step two of a hierarchical multiple regression analysis. The combined interaction term (LEC Total*SS Total) was entered in the third step as the predicted moderating variable. The interaction term indicated that social support did not moderate the relationship between trauma exposure and posttraumatic stress $F(3,177) = 1.32, p = .27$. Neither social support nor trauma exposure made a unique contribution to the model.

Hypothesis 5b: Social Support will moderate the relationship between trauma exposure and PTGI-SF scores. LEC Total and Social Support Total were

entered at step one and step two respectively, of a hierarchal multiple regression analysis. The combined interaction term (LEC Total*SS Total) was entered in the third step as the predicted moderating variable. Although there was a significant F value, $F(3,177) = 5.06, p = .001$, the R^2 change value (.000) was not significant ($p = .758$) indicating that social support did not moderate the relationship between trauma exposure and posttraumatic growth. Trauma exposure did make a significant contribution to the model as a whole ($beta = .234, p = .001$), followed by social support ($beta = .023, p = .018$) indicating a main effect for these variables.

Hypothesis 5c: Age will moderate the relationship between trauma exposure and posttraumatic stress. The trauma exposure and age interaction explained a significant increase in the variance in posttraumatic stress ($R^2 = .144, F(3,177) = 9.891, p < .001$). The interaction variable explained an additional 3.4% of the variance in PCL Total when trauma exposure and age are controlled for, R^2 change = .034, F change (1,177) = 6.975, $p = .009$. In the final model, trauma exposure ($beta = .616, p = .001$) and age ($beta = -.325, p < .001$) showed a significant main effect on posttraumatic stress. The interaction variable also accounted for a significant amount of variance in posttraumatic stress ($beta = -.459, p < .009$; See table 9 for a summary of results). A scatter plot with a fit line for each sub group of age (the moderating variable) highlights this interaction effect (see Figure 1.), where the relationship between trauma exposure and posttraumatic stress is relatively unaffected by the middle and older age group, whereas for younger participants, as trauma exposure increases, posttraumatic stress increases. There is a significant moderate correlation between trauma exposure and posttraumatic stress for younger participants ($r = .42, p < .001$) whereas the

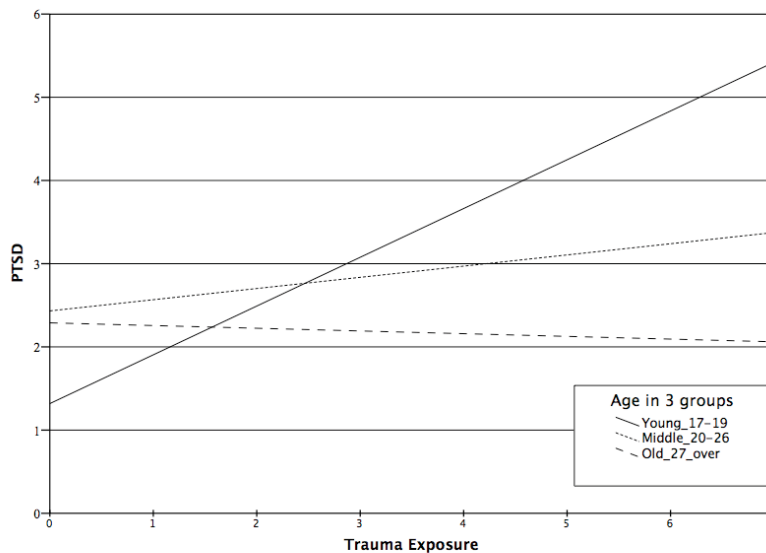
Table 9. Summary of Age Moderation Regression Analysis with Posttraumatic Stress as the Outcome Variable

Variable	β	R	R^2	ΔR^2
PCL-Total				
Step 1.		.12	.01	.01
LEC	.12			
Step 2.		.33	.11	.10***
LEC	.19**			
Age 3g	-.32***			
Step 3.		.38	.14	.03**
LEC	.62**			
Age 3g	-.33***			
Age x LEC.	.46**			

Note. $n = 18=1$. PCL-Total – Posttraumatic Stress Checklist-5. LEC = Life Events Checklist-5. Age 3g = Age in 3 groups. Age x LEC. = Age moderating variable interaction term. β = standardised regression coefficients. R = multiple correlation coefficients. R^2 = coefficients of determination. $\Delta R^2 = R^2$ change. * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 1.

Moderation of Trauma Exposure and PTSD symptoms by Age.



correlations between middle ($r = .09$) and older aged participants ($r = -.03$) are extremely small and not significant. This suggests that older age acts as a buffer to posttraumatic stress, with younger participants being more vulnerable to developing posttraumatic stress symptoms in response to experiencing more traumatic event types.

Hypothesis 5d: Age will moderate the relationship between trauma

exposure and posttraumatic growth. The trauma exposure and age interaction also explained a significant increase in the variance in PTG, $R^2 = .10$, $F(3,177) = 6.88$, $p < .001$. The interaction variable explained an additional 4.5% of the variance in PTG when trauma exposure and age were controlled for, R^2 change = .05, F change (1,177) = 8.80, $p = .003$. In the final model, trauma exposure showed a significant main effect on posttraumatic growth ($beta = .74$, $p < .001$). Age did not show a significant main effect ($beta = -.06$, $p = .41$), although age does have an effect through the interaction ($beta = -.53$, $p = .003$). A scatter plot with a fit line (see Figure 2.) for each sub group of age (the moderating variable) indicated that for older participants' there was no significant correlation between trauma exposure and posttraumatic growth ($r = .001$). For middle-aged participants this relationship increases slightly ($r = .24$). For younger participants there is a significant moderate to high correlation between trauma exposure and PTG ($r = .49$) suggesting that being younger may facilitate posttraumatic growth under conditions of high trauma exposure, whereas for older participants the level of trauma exposure has no effect on posttraumatic growth.

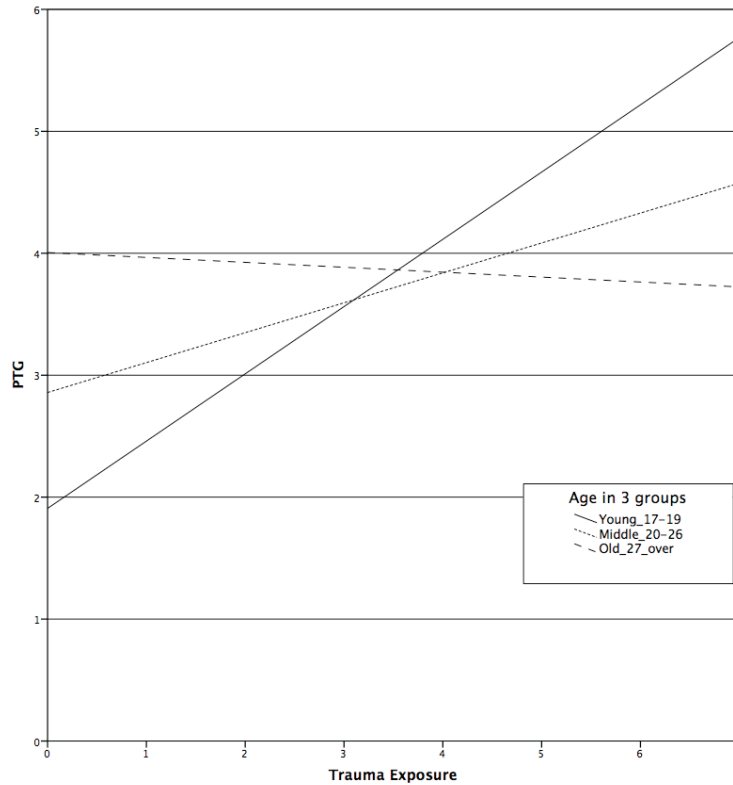
Table 10. Summary of Age Moderation Regression Analysis with Posttraumatic Growth as the Outcome Variable

Variable	β	R	R^2	ΔR^2
PTG-Total				
Step 1.		.24	.06	.06**
LEC	.24**			
Step 2.		.25	.06	.01
LEC	.25**			
Age 3g	-.05			
Step 3.		.32	.10	.05**
LEC	.74***			
Age 3g	-.069			
Age x LEC.	-.53**			

Note. $n = 18=1$. PTG-Total – Posttraumatic Growth Inventory-short form. LEC = Life Events Checklist-5. Age 3g = Age in 3 groups. Age x LEC. = Age moderating variable interaction term. β = standardised regression coefficients. R = multiple correlation coefficients. R^2 = coefficients of determination. $\Delta R^2 = R^2$ change. * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 2.

Moderation of Trauma Exposure and PTG by Age.



6. Discussion

Hypotheses are grouped and discussed in relation to the overarching constructs that they relate to in the following order; the relationship between trauma exposure and trauma outcomes; gender differences across constructs measured; age differences across constructs measured and moderating relationships; perceived social support relationships and moderating effects; and perceived coping self-efficacy relationships and moderating effects. Study limitations, practical implications and future directions are then discussed.

Hypothesis One: Trauma exposure and trauma outcomes

It was hypothesized that trauma exposure would show a significant positive correlation to both posttraumatic stress symptoms and posttraumatic growth. The trauma exposure total, which included the original LEC-5 items and 8 additional surf lifesaving specific events, did not show a significant correlation with either posttraumatic stress or PTG. The original LEC-5 items did, however, show a small but significant positive correlation with both posttraumatic stress symptoms and PTG.

Research on the impact of cumulative trauma exposure is inconclusive with some studies showing a strong relationship between the number of different types of traumatic events experienced and posttraumatic stress symptoms (Fjeldheim et al., 2014; Kolassa et al., 2010; Regehr et al., 2000), and some showing no relationship (Meyer et al., 2012). In a hierarchical multiple regression analysis by Armstrong et al. (2014), posttraumatic stress symptoms and PTG were higher in a sample of Australian firefighters who had experienced both personal and work-related trauma, compared to

those who had only experienced work related trauma. Calhoun and Tedeschi (2013) suggest that trauma in one's personal life has a greater impact on personal schemas and fundamental beliefs because they have greater emotional relevance and a stronger personal impact, which results in a heightened level of cognitive disruption and processing. The impact of work related trauma may be buffered against due to an emotional disconnect with the trauma, with work related training and preparation shifting emergency workers fundamental assumptions to include the possibility of work related trauma (Armstrong et al., 2014). In a study by Lilly and colleagues (2009) female civilians reported significantly higher peritraumatic emotional distress compared to female police officers; female civilians also reported higher posttraumatic stress symptoms. Although female police officers experienced significantly more traumatic events this study suggests that lower emotional distress experienced at the time of the traumatic event may result in lower stress symptoms, and that those trained to deal with potentially traumatic events may be more competent to cope with emotional distress. This highlights the divide between personal and work related trauma and the possible influence of emotional distress and personal schemas or belief systems.

Hypothesis Two: Gender differences

Gender differences in posttraumatic stress. Gender differences in PTSD have been shown to vary depending on the population sampled, with females presenting with significantly higher rates of PTSD in civilian samples (Brewin et al., 2000; Stein et al., 2000; Tolin & Foa, 2006), whereas military and emergency service populations fail to present any gender differences in posttraumatic stress (Berger et al., 2012; Brewin et al.,

2000; Kehl et al., 2015; Pole et al., 2001; Prati & Pietrantonio, 2010; Sattler et al., 2014; Stephens et al., 1997; Sutker et al., 1995).

It was hypothesized that the current sample would have a similar presentation to other emergency service populations and there would be no significant gender differences in posttraumatic stress symptoms; this hypothesis was not supported. The current study found that female lifeguards experienced on average higher levels of posttraumatic stress than males suggesting that this sample is more representative of the general population. This is somewhat surprising given the extensive training involved in surf lifesaving. It has been suggested that the extensive training within both military and emergency service organisations equips both males and females to the same level to cope with potentially traumatic events (Berger et al., 2012; Kehl et al., 2015).

It is important to note that the majority of studies with military and emergency service samples had an overrepresentation of males ranging from 79% to 96% (Kehl et al., 2015; Pole et al., 2001; Stephens et al., 1997; Sutker et al., 1995). A large review of the literature on PTSD in rescue teams noted that three-quarters of the studies reviewed had samples with around 85% males which may reduce the power required to detect gender differences (Berger et al., 2012). The apparent lack of gender differences in military and emergency service samples may be due to a methodological error. The current sample had an even 50/50 split between males and females, which is more representative of studies with the general population.

There was, however, a study by Prati and Pietrantonio (2010) that found no effect of gender in their sample of Italian police where 50.2% of the sample were male in which power would not have been an issue. The apparent lack of a gender difference in military and emergency service populations compared to the general population is further supported in a study by a Lilly et al. (2009) where although female police

officers reported experiencing more traumatic events, they exhibited lower posttraumatic stress symptoms compared female civilians. Lilly and colleagues highlight the importance of distinguishing between male and female sex, and male and females gender roles. It may be that in occupations where females take on a more masculine gender role, or where gender roles are considered more equal, gender differences in posttraumatic stress are not as evident (Lilly et al., 2009). Another possible explanation is that there may be other factors, other than gender that influence posttraumatic stress reactions. Female civilians in Lilly and colleague's study also reported experiencing a more heightened emotional response during the traumatic events (Lilly et al., 2009). This suggests that military and emergency service populations may be more equipped than civilians to manage peri-traumatic emotional distress, reducing subsequent posttraumatic stress.

It appears that surf lifesavers in the current sample differ from other emergency service populations in their response to work related trauma as well. The current study failed to find a significant relationship between total trauma (including work related surf lifesaving trauma) and posttraumatic stress. Only the original stress measure items that were more personally salient were related to posttraumatic stress. This suggests that it may be the type of trauma experienced that will influence whether gender differences in posttraumatic stress will be observed. The observed gender differences in the current study may reflect a stronger influence of personal-related trauma on posttraumatic stress, suggesting this sample is more representative of the general population.

Gender differences in Posttraumatic Growth. The current study hypothesized that females would present with higher rates of PTG than men. This hypothesis was not supported with males and females failing to show significant difference in PTG. The

lack of gender differences in posttraumatic growth has been observed in both the general population and military/emergency service populations (Cann et al., 2010; Cieslak et al., 2009; Glad et al., 2013; Kehl et al., 2015; Maguen et al., 2006).

Some studies have found females to present with higher levels of PTG compared to males (Shand et al., 2015; Tedeschi & Calhoun, 1996), including a large meta-analysis by Vishnevsky and colleagues (2010). This is not surprising given that PTG is often correlated with PTSD (Cieslak et al., 2009; Mystakidou et al., 2015) and that women tend to report higher levels of PTSD than men (Brewin et al., 2000; Stein et al., 2000; Tolin & Foa, 2006). Although the current study also found a moderate correlation between PTSD and PTG, there were still no gender differences in PTG. One possible explanation for the gender difference in PTG is that women tend to engage in more purposeful rumination in response to trauma (Treyner, Gonzalez, & Nolen-Hoeksema, 2003) which is a primary process in the development of PTG (Janoff-Bulman, 1992; Tedeschi & Calhoun, 2004).

A meta-analysis by Vishnevsky and colleagues (2010) found that age moderated the relationship between gender and PTG with women reporting increases in PTG as age increased. The authors suggest that as women get older, they are more likely to experience potentially traumatic events that involve loss, resulting in a stronger impact on beliefs and schemas. They also note that gender differences were more pronounced for events that were related to bereavement. Given that the current study sample was relatively young, this may explain the failure to detect gender differences.

Hypotheses Three and Five: Age differences

Age differences in Trauma Exposure and Posttraumatic Stress. Given that the method for measuring trauma exposure in the current study was lifetime exposure to different types of potentially traumatic events, it is not surprising that middle and older aged participants experienced significantly more different types of traumatic events than younger participants. If trauma exposure was measured within a restricted time frame, on an event frequency basis, the current study may have been more in line with current research suggesting that youth would have higher rates of risky behaviour and therefore higher risk of trauma exposure (Nooner et al., 2012).

Prevalence rates of PTSD in the general population range from 1.3 to 7.8% (Davidson et al., 1995; Kessler et al., 1995; McLaughlin et al., 2015) and between 3 to 57% in adolescent samples (Nooner et al., 2012). In the current study, 1.8% of participants 20 years or older scored above the suggested cut off score of 40 indicating probable PTSD, whereas 7.2% of adolescents aged 17 to 19 years of age scored above the cut-off score. Younger (17 to 19 years old) and middle-aged (20 to 26 years old) participants experienced significantly higher posttraumatic stress symptoms than older (27 and over) participants, which is in line with current research (Nooner et al., 2012).

Because of the strong contribution of age in predicting posttraumatic stress an additional moderation analysis was run and found that age moderated the relationship between trauma exposure and posttraumatic stress. This analysis showed that for older participants, posttraumatic stress was unrelated to trauma exposure, whereas for younger participants, there was a moderate and significant relationship between trauma exposure and posttraumatic stress. In summary, the relationship between trauma exposure and posttraumatic stress is dependent on the age of the sample.

This result is counter to the common finding that in adult samples cumulative trauma exposure leads to increases in PTSD, also known as the "building block" effect (Neuner et al., 2004). For example Kehl and colleagues (2015) found that firefighters who experienced more life-threatening work-related incidents reported higher levels of PTSD.

The heightened vulnerability of adolescents who have experienced more different types of traumatic events in the current study is in line with a large meta-analysis by Nooner and colleagues (2012) who found that repeated trauma exposure increased the risk of developing PTSD. Immature cognitive capacities of adolescents are hypothesized to explain their vulnerability to trauma (Gan et al., 2012; Nooner et al., 2012). The cognitive process in the appraisal of threat and cognitive capacity required to process trauma may be less developed in younger individuals (Janoff-Bulman, 1992; Lakey & Cohen, 2000; Lupien et al., 2009), which may explain this vulnerability to posttraumatic stress symptoms. As the adolescent brain is still developing, vulnerability in the prefrontal cortex, which is involved in the brain's stress response system, suggests that repeated exposure may have a significant effect (Lupien et al., 2009).

Age differences in Trauma Exposure and Posttraumatic Growth.

Posttraumatic growth in adolescence has received much less attention in the literature on adolescent trauma. It was theoretically hypothesized that younger participants would present with lower PTG than older participants due to a more immature cognitive capacity to engage in the type of rumination required for PTG (Glad et al., 2013; Janoff-Bulman, 1992). Preliminary analyses showed that there were no significant differences in mean PTG scores across the three different age groups and no significant correlation between PTG and age. In a model to predict PTG, age failed to

make a significant unique contribution. Initially, this would suggest that PTG is not affected by age.

An exploratory moderation analysis was run and found that similar to posttraumatic stress, age also moderated the relationship between trauma and PTG. Levels of PTG remained relatively stable across the low/high trauma scale for older participants, whereas for younger participants, there was a significant increase in PTG as trauma increased. There was a moderate to high correlation between trauma exposure and PTG for younger participants. Considering that trauma exposure made the strongest unique contribution to a model predicting PTG it is interesting that this relationship is dependent on age.

It appears that being younger may facilitate PTG under conditions of high trauma. The significance of experiencing continued distress in the process of developing PTG (Calhoun & Tedeschi, 2013; Janoff-Bulman, 1992) is evident in this finding and is further supported by the significant correlation between posttraumatic stress and PTG. This goes against the proposition that adolescents' do not have the cognitive maturity to develop PTG (Glad et al., 2013; Janoff-Bulman, 1992), and in fact, suggests the opposite. It is important to note that older and middle-aged participants experienced on average significantly more different types of traumatic events than younger participants. The range of scores on trauma exposure for older participants (3 to 42 traumatic events) and middle-aged participants (4 to 46 events) was also different to young participants (0 to 34). It is possible that because younger participants reported experiencing significantly less different types of traumatic events, they may have had less opportunity for their fundamental assumptions to be shattered, leaving previous cognitive schemas about themselves and their world intact. Perhaps younger participants in the high trauma group are experiencing a shattering of fundamental

assumptions for the first time within a relatively short time frame, compared to older participants who have had more experience with traumatic events over time. The shattering of fundamental assumptions may have a stronger impact on youth under conditions of high trauma because their world has not been seriously challenged before. Adolescents in this particular age group are coming out of the stage in life when they are developing autonomy and constructing their own identity and place within the world (Bandura, 1997). Adolescents' often have the belief that they are invincible and that negative events only happen to "other" people (Calhoun & Tedeschi, 1999). This newly constructed belief system may be more vulnerable to the impact of trauma causing a shattering of assumptions resulting in posttraumatic stress. At the same time, this age group may also have the cognitive capacity to rebuild this world, as it is less solidified than older individuals and more open to influence and reconstruction, resulting in PTG (Janoff-Bulman, 1992).

Hypothesis One, Four, and Five: Perceived Social Support

Perceived Social Support and Posttraumatic Stress. Perceived social support did not show evidence of the hypothesized relationships in the current study with surf lifeguards. It was hypothesized that there would be a significant negative relationship between social support and posttraumatic stress, and that perceived social support would significantly predict posttraumatic stress after controlling for trauma exposure and pre-trauma variables. In a model predicting posttraumatic stress, the variables age, trauma exposure and gender all showed a significant unique contribution to posttraumatic stress, whereas social support did not. It was not surprising then that

perceived social support did not moderate the relationship between trauma exposure and posttraumatic stress.

Failure to find a significant relationship between social support and posttraumatic stress may be due to the way perceived social support and trauma were measured. The support-stress matching hypothesis proposes that the value of perceived social support in relation to trauma outcomes is dependent on the matching of the type or source of social support with the specific needs required by the type of trauma experienced (Cutrona & Russell, 1990; Kaniasty & Norris, 1992). The differential effect of different sources of social support on posttraumatic stress is well documented in emergency service populations showing both main and moderating effects (Fjeldheim et al., 2014; Regehr et al., 2000; Sattler et al., 2014; Stephens & Long, 1999; Stephens et al., 1997).

In a study with the New Zealand police, social support from peers, supervisors, and support outside of work all showed a negative relationship with posttraumatic stress symptoms (Stephens et al., 1997). Attitude towards expressing emotion was the only variable that moderated the relationship between trauma exposure and posttraumatic stress symptoms. This study employed the same social support scale as the current study (Caplan et al., 1975) but also included measures of the content of communication, ease of talking about trauma at work, and attitudes towards expressing emotions at work. These four measures were used to compute composite variables for analyses which resulted in five variables; peer support; supervisor support; negative support; attitudes towards expressing emotion; and non-work social support. It is possible that the inclusion of the other social support variables matched with the type of stress experienced by this population, resulting in significant relationships. The current study had a relatively simple measure of perceived social support, which may not have

matched the specific types of stressors or needs experienced by this particular group. As no other published trauma related studies with surf lifesavers were found, the surf lifesaving social support sources were exploratory and incorporated into a work related social support measure (Caplan et al., 1975). Future research with this population would benefit from ensuring that the social support measure and sources are valid for this particular population.

Perceived Social Support and Posttraumatic Growth. The current study with surf lifesavers found a small but significant positive relationship between perceived social support and PTG. Perceived social support also made a small but significant contribution to a model predicting PTG. Each social support subscale/source showed a small yet significant correlation with PTG, with the exception of perceived social support from a Patrol Captain, which was not significant.

Significant correlations between social support and PTG have been found with cancer patients (Lotfi-Kashani et al., 2014; Shand et al., 2015), students, survivors of violent crime, and trauma workers (Brooks et al., 2016). Analysis of different sources of social support has received less attention in PTG literature. The current study found that support from a significant other, family/whanau/friends, surf lifesaving peers, and peer support worker showed small but significant correlations with PTG. When the sample was split into young (17 to 19 years old) and middle/older (20 and over) age groups, the relationship between different sources of support and PTG changed. The only source that remained significant for younger participants was a Peer Support Worker. For older participants, all sources remained significant with the exception of a peer support worker. This may be explained by the optimal matching theory between stress experienced and support required for unique populations or types of stressors (Cutrona

& Russell, 1990; Kaniasty & Norris, 1992). Research on the effects of different sources of social support on posttraumatic stress symptoms shows that for different populations, different sources of social support have differential effects (Fjeldheim et al., 2014; Regehr et al., 2000; Sattler et al., 2014; Stephens & Long, 1999; Stephens et al., 1997).

It was hypothesized that social support would moderate the relationship between trauma exposure and posttraumatic growth. This hypothesis was based on theoretical grounds as moderating effects of social support has received less attention in PTG trauma literature. It was hypothesized high levels of social support would facilitate PTG under conditions of high trauma exposure. This was based on the theory that there needs to be a significant amount of distress in order for fundamental assumptions to be shattered and that under conditions of high perceived social support, those individuals will have a more supportive social environment to engage in the cognitive reprocessing required to reconstruct their assumptive world (Calhoun & Tedeschi, 1999; Tedeschi & Calhoun, 2004). However, this was not the case in the current study where social support did not moderate the relationship between trauma and PTG in surf lifesavers. The effect of trauma exposure on PTG was independent of the level of perceived social support.

Hypothesis One and Four: Perceived Coping Self-Efficacy

Perceived Coping Self-Efficacy and Posttraumatic Stress. It was hypothesized that high levels of perceived coping self-efficacy would be associated with lower levels of posttraumatic stress and that self-efficacy would make a unique contribution to a model predicting posttraumatic stress symptoms. The current study found no evidence

of a significant relationship between self-efficacy and posttraumatic stress. Self-efficacy also failed to make a significant unique contribution to a model predicting posttraumatic stress symptoms. It is interesting to note that older participants reported significantly higher perceived coping self-efficacy than middle and younger aged participants, and reported significantly lower posttraumatic stress symptoms. Individuals' low in self-efficacy are likely to appraise a potentially traumatic event as a threat, and perceive that they do not have the coping resources available to minimize that threat leading to the experience of stress or trauma (Hobfoll, 1988; Hobfoll et al., 1990; Jerusalem & Schwarzer, 1992). Low self-efficacy is hypothesized to be built up from past experiences of failure which can cause an individual to be oversensitive to threat and vulnerable to stress (Jerusalem & Schwarzer, 1992). Perhaps older individuals in this sample are at a higher rank within the organisation with more experience of successful coping in surf lifesaving, which has helped to build a stronger sense of self-efficacy. It is possible that younger participants, who are still in training and are subordinate to older colleagues, may have more recent experience with failure and therefore lower perceived self-efficacy.

This is in contrast to other studies where years of employment as a firefighter was negatively associated with self-efficacy (Regehr et al., 2003) and years of employment as a police officer predicted non-resilient group membership (Prati & Pietrantonio, 2010). Regehr and colleagues suggest that younger emergency workers may have more opportunity for growth within the organisation and more recent training experience which may result in higher perceived self-efficacy compared to colleagues who have been working for a longer time. It is important to note that there is an assumption in the current study that older participants have been engaging in surf lifesaving for a longer period of time than younger participants. It is also important to

note that younger participants in the current study range from 17 to 19 years old. Participants in the studies by Regehr and colleagues, and Prati and Pietrantonio ranged from 22 to 60 years old. This further highlights the unique age distribution of this group of emergency service workers.

Perceived Coping Self-Efficacy and Posttraumatic Growth. The current study found a small but significant correlation between perceived coping self-efficacy and PTG, with higher levels of self-efficacy being associated with higher levels of PTG. However, self-efficacy did not significantly contribute to a model predicting PTG. This positive correlation between self-efficacy and PTG is in line with previous studies. Both Cieslak and colleagues (2009) and Pooley and colleagues (2013) found significant correlations between self-efficacy and PTG in their samples of survivors of natural disasters. It appears in the current study, high levels of self-efficacy may contribute to the development of PTG by enhancing beliefs about one's ability to cope with challenge, having the motivation to work through struggle (Schwarzer & Jerusalem, 1995) and the foresight that although you may struggle growth is still possible (Bandura, 1997).

Study Limitations

The main limitations to the current study include the study design, the error in selecting age demographics, and the method of measuring trauma exposure. It is recognized that there are other limitations that can be noted in the current study but the

most prominent limitations will be the focus of this section with the intention of aiding future research with this population.

The practical advantages of a cross-sectional design study need to be weighed up against the limitation of not being able to infer the direction of observed relationships. For example in the current study, correlations between perceived social support and PTG do not offer any indication as to whether high social support enhanced PTG or whether the experience of PTG lead to an increase in perceived social support. Longitudinal studies give you the advantage of measuring change over time; however, they are not always suitable within some research frameworks. A cross-sectional design was chosen as it allowed for timely collection of data and complete anonymity for participants. It is possible to support cross sectional findings with published longitudinal data if from a similar sample population. This was slightly problematic for the current study given the unique population sampled and lack of published literature.

It is also recognised that there may be sampling bias with the use of an online platform to advertise and complete the survey as it limits those who will have access to the survey. Although the use of Facebook in research has been shown to be a valid means of recruiting participants (Kosinski et al., 2015; Thornton et al., 2016) there may be some bias in participant selection.

The original study intended on including all current lifeguards who were 16 years and older. There was an error in the online survey that did not allow for participants who were 16 years of age to select their age, which meant this group was excluded from participation. This error was identified two weeks into data collection. At this time, 150 participants had already participated and 71 more were still being processed. It was decided to keep the survey as it was, excluding 16-year-old

participants, as a large number of people had already participated and there were some technical risks with changing the survey once it had already been started.

There are some further limitations that may have come from this error. Of the original sample, 25.3% indicated that they were 17 years old, and 8.5% of the total sample selected under the age of 16, which meant they could not continue. It is possible that some 16 year olds participated in the survey by indicating that they were 17 years of age, overinflating the number of participants in the 17-year-old age group. However, current demographic information on Surf Lifesaving New Zealand suggests that the majority of surf lifeguards are under the age of 18 (78.9%), therefore the overrepresentation of 17 year olds in the current study may be representative of an overrepresentation of this age group within the organisation.

It is important when measuring trauma exposure that the measure used is theoretically grounded in the understanding of trauma exposure and its relationship with trauma outcomes (Harkness & Monroe, 2016). It is widely recognized that cumulative trauma exposure can lead to the development of posttraumatic stress symptoms (Fjeldheim et al., 2014; Neuner et al., 2004; Regehr et al., 2000). The current study makes the assumption that individuals who have experienced a higher number of different types of traumatic events will have a stronger trauma response. The same assumption would underlie the use of measuring event frequency, assuming that individuals who have experienced more traumatic events would have stronger trauma responses. Some studies have failed to find a significant relationship between cumulative trauma exposure and trauma outcomes (Meyer et al., 2012; Prati & Pietrantonio, 2010; Sattler et al., 2014) suggesting that some individuals may develop posttraumatic stress or PTG from just one traumatic experience, and some may experience many different potentially traumatic events and not develop any symptoms.

The current study found a small but significant correlation between personal trauma experiences and both posttraumatic stress and PTG. However, the inclusion of surf lifesaving-specific potentially traumatic events did not yield significant relationships to trauma outcomes. It is possible that there are other factors surrounding the trauma experience that influence the development of trauma outcomes. For example, in a study by Lilly and colleagues (2009) emotional distress experienced during the traumatic event was significantly related to trauma outcomes. The current study did not measure subjective responses to potentially traumatic events, which may show a stronger relationship to trauma outcomes.

The LEC-5 (Weathers, Blake, et al., 2013b) is often used alongside the Posttraumatic Stress Disorder Check List - Five (Weathers, Litz, et al., 2013) in the assessment and diagnosis of PTSD. Perhaps the use of a qualitative approach in conjunction with the psychometric measures would offer more insight into personal responses to trauma. Clinician administered interviews are considered a more valid approach to the assessment of PTSD; however, there are still concerns over the validity of retrospective recall of cumulative exposure to potentially traumatic events (Harkness & Monroe, 2016).

There is some debate in the trauma literature, whether to measure trauma exposure as the frequency of experiencing potentially traumatic events or the number of different types of traumatic events experienced. Any retrospective recall of trauma exposure can be problematic due to the possibility of an impaired memory system as a result of experiencing trauma (Harkness & Monroe, 2016), and the influence of heightened emotionality and the nature of flashbacks resulting in an overestimation of trauma exposure (Brewin et al., 2000). Measuring the different types of trauma experienced has been shown to be a more reliable method as it reduces the likelihood of

under or over estimation of trauma exposure, particularly if a sample has experienced some events many times over a long period of time (Harkness & Monroe, 2016; Wilker et al., 2015). Harkness and Monroe (2016) found that adding event frequency to a measure of event types did not add any predictive value in a model predicting trauma outcomes. One significant problem with measuring event types is that one traumatic event may comprise of a number of different event types that are intertwined making it difficult to determine whether an event is one trauma or many different traumas (Harkness & Monroe, 2016). Differences in interpretation of the trauma exposure measure may result in variable responses of the number of event types experienced.

Directions for Future Research

The current study has identified two key areas for future research that relate to the study design and have some important possible directions that follow from these suggestions. Firstly, the use of mixed method qualitative/quantitative designs to extend knowledge of adolescent trauma responses and to allow for cultural or religious frameworks. Secondly, the use of prospective/longitudinal study designs to assess the direction of relationships and trajectory of resilience and recovery.

The study of trauma outcomes in emergency services is well documented. However, this unique group of emergency workers includes adolescents who are potentially exposed to some highly traumatic events. Most of the literature on trauma in adolescence is based on personal trauma, natural disaster trauma or war related trauma. There were no identified studies that explored work related trauma in adolescence. The significant moderating effects of age on the relationship between trauma exposure and

both posttraumatic stress symptoms and PTG suggests that future research would benefit from not only including 16 year olds, but also including lifeguards from the age of 14 years old. Future research of a qualitative/quantitative mixed method approach could be beneficial given the extra care required for research with younger participants, to ensure an in-depth understanding of young lifeguards experiences with trauma alongside ensuring ethical concerns are well managed. A more in-depth mixed method approach would also allow for cultural or religious aspects of trauma to be explored in a safe and valid framework. This is an important consideration given New Zealand's bi-cultural environment and commitment to Te Tiriti O Waitangi.

Although neither social support nor self-efficacy showed evidence of the expected relationships with trauma outcomes, it is possible to evaluate the relationship between social support and self-efficacy through a prospective approach to shed some light on the subsequent impact on trauma outcomes (Benight & Bandura, 2004; Warner, Gutierrez-Dona, Villegas Angulo, & Schwarzer, 2015). The cultivation hypothesis suggests that individuals high in self-efficacy will have the skills to cultivate supportive relationships in times of stress, subsequently minimizing the impact of trauma (Benight & Bandura, 2004). The enabling hypothesis suggests that individuals with high levels of social support will perceive supportive others as models of how to cope, observing adaptive coping behaviours resulting in enhanced self-efficacy (Benight & Bandura, 2004). Prospective studies exploring these relationships would ensure a more valid interpretation of the direction of the relationships and the interaction between social support and self-efficacy.

The use of a prospective or longitudinal study may also help to identify the difference between resilience and recovery. Tracking the trajectory of response to an identifiable traumatic event would enable researchers to distinguish between those who

initially experienced threshold or sub-threshold trauma symptoms indicating trauma recovery, and those who remained resilient to the effects of trauma.

Bonanno (2004) suggests that a critical incident stress debriefing approach, offering intervention to everyone exposed to a potentially traumatic event, may not be beneficial and may even be harmful to resilient individuals as it disrupts and pathologizes a normal trauma response. Screening individuals for signs of posttraumatic stress and being aware of possible risk and protective factors is one alternative to the traditional critical incident stress debriefing approach (Bonanno, 2004). This will not only reduce the possibility of resilient individuals receiving harmful or unnecessary intervention, but organisational resources will be utilised more efficiently.

Surf Lifesaving New Zealand has a peer support programme in place that enables experienced fellow lifeguards to offer a Peer based, support and risk screening procedure after a lifeguard or group of lifeguards are exposure to a critical incident. Whilst this approach is supported by current literature on organisational responses to critical incidents (Creamer et al., 2012; Shave, 2010), the unique age distribution of this population of rescue workers suggests that more specific evidence-based practice guidelines would be valuable. Although the current study failed to find significant relationships between perceived social support and posttraumatic stress symptoms, the value of social support in both trauma recovery and resilience is well supported in trauma literature. An evaluation of the current Peer Support practice within the Surf Lifesaving NZ organisation and an evaluation of other sources of support within the organisation could be a significant area of future research.

Conclusion

It appears that lifeguards in the current study are exposed to a range of potentially traumatic events whilst patrolling beaches in New Zealand. However, surf lifesaving potentially traumatic events were not significantly related to either posttraumatic stress or posttraumatic growth. Potentially traumatic events that participants experienced outside of surf lifesaving did show a significant relationship to both posttraumatic stress and posttraumatic growth, suggesting that personal trauma may have a stronger impact than work-related trauma. The findings of the current study suggest that surf lifesavers may be fairly resilient to the effects of potentially traumatic events experienced whilst surf lifesaving.

Younger lifeguards may be more vulnerable to posttraumatic stress when they have experienced a wider range of different traumatic event types. Although younger participants experienced significantly less potentially traumatic events compared to older participants, they reported experiencing significantly higher levels of posttraumatic stress symptoms. The percentage of participants 20 years and older with probable PTSD was 1.8%, compared to 7.2% of participants under the age of 20. At the same time, adolescents appear to have the capacity to develop PTG in response to high trauma exposure, whereas posttraumatic stress and PTG seem to be unrelated to the level of trauma exposure for older lifeguards. In line with trauma research with the general population, female lifeguards may also be more vulnerable to posttraumatic stress.

Although perceived social support and perceived self-efficacy did not show evidence of the expected relationships to trauma outcomes, this line of research should not be dismissed. The influence of perceived social support and perceived self-efficacy

is well documented in the trauma literature with the general population and emergency service populations. Methodological issues in the current study may explain these insignificant relationships and further research would benefit from developing these hypotheses further.

New Zealand surf lifeguards' exposure to potentially traumatic events and subsequent trauma outcomes is an area that has been largely neglected in the field of trauma research. The current study adds to the literature on trauma for both emergency service populations and adolescent trauma exposure. Key areas of potential future research have been highlighted. It is hoped that this study may be a starting point for further research with this important and unique group of emergency service workers.

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Appendix A.
Survey Facebook Post



Kia Ora,

My name is Aimee Rooke, I am doing a Master's Degree in psychology at Massey University.

I have developed a survey to consider Surf Lifesaver's exposure to critical incidents whilst patrolling New Zealand beaches and how this might impact on their psychological wellbeing. This survey will also explore the influence of social support and perceptions of one's ability to cope.

There is a lack of research that focuses on this important group of first responders. I hope that this study will offer some unique insight into how best to support New Zealand lifeguards, and be a starting point for further research.

It is open to any current lifeguards who are 16 years or older and will take 15 to 20 minutes to complete. It is anonymous and does not require any personal stories.

You can go into the draw to win one of x 10 \$40 Prezzy Cards.

Click the link below, or please share it with someone you know that would be eligible to participate. This survey can also be completed on a smartphone.

https://qasiasingleuser.asia.qualtrics.com/jfe/form/SV_8cXiuNL3GGIQxtH

Appendix B

Participant Information Sheet

Trauma Exposure and Psychological Wellbeing of New Zealand Surf Lifesavers

PARTICIPANT INFORMATION SHEET

Kia Ora, my name is Aimee Rooke, and I am doing a Master's degree in Psychology at Massey University.

Aim of study:

My research is looking at New Zealand Surf lifesavers exposure to trauma, and how this might impact on their psychological wellbeing. I will explore both, sources of social support and perceptions of self-efficacy, and their relationships to posttraumatic stress symptoms and posttraumatic growth. There is already a lot of research on emergency service personnel, including police, firefighters, and paramedics, however there is none to my knowledge looking at surf lifesavers. I hope that this study will offer some unique insight into how best to support both volunteer and paid lifeguards.

What is involved:

If you were a paid or volunteer lifeguard in New Zealand over the summer of 2016/2017 and you are 16 years or older, I would like to invite you to participate in this study.

I have put together an online survey, which is expected to take 15 to 20 minutes to complete. It consists 77 questions. All responding is either on a checklist or rating scale. You do not need to give any personal detail and your data cannot be linked to your demographic details.

Participation is voluntary and anonymous, no one will know whether you have participated or not.

All participants will go in the draw to win one of 10 x \$40 Prezzy Cards, as a token of appreciation for taking part in this study and giving your time.

Confidentiality, and use of data:

All survey data is kept confidential. You may stop the survey at any stage, however once completed and submitted, you will not be able to retract your survey data as there is no way of tracing your data back to you.

All survey data is kept confidential. You may stop the survey at any stage, however once completed and submitted, you will not be able to retract your survey data as there is no way of tracing your data back to you. Survey data will be used for my Masters thesis. This study may be published and form the basis of further research with Surf Lifesaving NZ. My supervisor and myself will be the only people who have access to the raw data. Data will be stored on my private hard drive under password protection and kept for 5 years. I am not involved in the Surf Lifesaving NZ organisation and there is no conflict of interest for myself as the researcher. The results from this study will be presented to the organisation to offer some insight on how to best support New Zealand Surf Lifesavers.

How to find the survey results:

This study will be completed by the end of February 2018. Please note that there will be no personally identifying information or reference to specific clubs. If you would like a summary of the study, this can be emailed to you once the study is completed. This will also be posted on the Surf Lifesaving New Zealand Facebook page and news page.

Survey questions that you may find distressing:

There is a list of potentially traumatic events, in which you are required to indicate on a checklist which ones you have experience with. You are also required to indicate on a list of stress symptoms, which ones you have experienced in the past month. You are not required to give any detail and you can skip any of these sections if you find them too distressing. There are three other sections that will ask you about social support, your own coping abilities, and positive changes that can develop through coping with traumatic experiences. It is important to remember that you can stop participating in the survey at anytime, should any of the questions be too distressing for you.

Should you experience any distress whilst completing this survey, or any time after, it is important that you seek support.

You can talk to your GP (**General Practitioner**) or if you would like some information on contacting a Clinical Psychologist please refer to:

- **The New Zealand Psychological Society**
<http://www.psychology.org.nz>
- **The New Zealand College of Clinical Psychologists**
<http://www.nzccp.co.nz>

Please note that there will be a cost for engaging in these services.

Alternatively you can free call the numbers below:

- **Youthline**
0800 376633 or free text 234
- **Anxiety New Zealand Trust**
0800 ANXIETY (0800 2694389)

Your Rights:

You are under no obligation to accept this invitation.

Completion and submission of the questionnaire implies consent. You have the right to decline to answer any particular question.

Project Contacts

If you have any questions regarding this study please contact myself, or my research supervisor.

Aimee Rooke (Researcher):
aimeerooke@live.com
0278350824

Ian deTerte (Massey University research supervisor)
I.deTerte@massey.ac.nz

Committee approval statement:

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named above are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher(s), please contact Dr Brian Finch, Director, Research Ethics, telephone 06 356 9099 x 86015, email humanethics@massey.ac.nz.

Appendix C

Extended Descriptive Statistics for Measures with *t*-Test and Effect Sizes

Table 1. Summary of descriptive statistics for subscale measures with *t* test and effect sizes

Measure	<i>N</i>	Min-Max Score	<i>M</i> (<i>SD</i>)	<i>t</i>	<i>d</i>
LEC-Orig.					
Male	90	0-16	5.70 (3.90)		
Female	90	0-16	5.13 (3.43)		
Total	180	0-16	5.42 (3.67)	1.04	.16
LEC-SLS					
Male	90	0-24	9.82 (6.27)		
Female	90	0-24	8.09 (5.29)		
Total	180	0-24	8.95 (5.85)	1.99*	.30
SS Sig. Other					
Male	90	0-20	14.05 (5.23)		
Female	90	0-20	13.29 (6.18)		
Total	180	0-20	13.67 (5.72)	0.90	.13
SS Whanau					
Male	90	4-20	13.78 (4.00)		
Female	90	6-20	15.57 (3.83)		
Total	180	4-20	14.72 (4.01)	-3.21*	.46
SS SLS Peers					
Male	90	2-20	13.32 (3.96)		
Female	90	0-20	13.72 (4.55)		
Total	180	0-20	15.52 (4.26)	-0.63	.09
SS Patrol Capt					
Male	90	0-20	10.95 (5.42)		
Female	90	0-20	11.60 (5.89)		
Total	180	0-20	11.27 (5.65)	-0.77	.11
SS Peer Worker					
Male	90	0-20	6.06 (6.19)		
Female	90	0-20	5.83 (6.40)		
Total	180	0-20	6.22 (6.29)	0.81	.04

Note: LEC-Orig = LEC original items. LEC-SLS = Surf lifesaving specific items. SS Sig. Other = Social support Significant other subscale. SS Whanau = Social Support Family/Whanau/Friends subscale. SS SLS Peers = Social support Surf Lifesaving Peers subscale. SS Patrol Capt = Social Support Patrol Captain sub scale. SS Peer Worker = Social support Peer Support Worker subscale. Min – Max Score = minimum and maximum score for each measure in this study. *t* = *t*-test statistic for the difference between mean scores for males and females. * = *p* < .05, ** = *p* < .001. *d* = Cohen's *d*.

Subscale Descriptive Statistics for Measures with *F*-Test and Effect Sizes

Table 2. Summary of descriptive statistics for subscale measures with *F* test and effect sizes

Measure	<i>N</i>	Min – Max Score	<i>M</i> (<i>SD</i>)	<i>F</i>	η^2
LEC-Orig					
Young	69	0-11	4.20 (3.00)		
Middle	55	1-16	5.96 (3.86)		
Old	57	0-15	6.37 (3.84)		
Total	181	0-16	5.41 (3.66)	6.73*	.07
LEC-SLS					
Young	69	0-18	7.35 (5.09)		
Middle	55	0-24	9.85 (5.85)		
Old	57	0-24	9.89 (6.40)		
Total	181	0-24	8.91 (5.86)	4.12*	.04
SS Sig.Other					
Young	69	0-20	12.65 (5.75)		
Middle	55	0-20	13.72 (5.96)		
Old	57	0-20	14.61 (5.60)		
Total	181	0-20	13.59 (5.80)	1.83	.02
SS Whanau					
Young	69	6-20	15.50 (3.82)		
Middle	55	4-20	15.00 (3.91)		
Old	57	4-20	13.58 (4.15)		
Total	181	4-20	14.74 (4.01)	3.86*	.04
SS SLS Peers					
Young	69	5-20	13.65 (4.39)		
Middle	55	6-20	14.96 (3.47)		
Old	57	0-20	11.89 (4.29)		
Total	181	0-20	13.50 (4.26)	7.19**	.08
SS Patrol Capt					
Young	69	0-20	12.59 (5.02)		
Middle	55	0-20	11.95 (6.17)		
Old	57	0-20	9.00 (5.20)		
Total	181	0-20	11.26 (5.34)	7.38	.08
SS Peer Work					
Young	69	0-20	6.74 (6.50)		
Middle	55	0-20	5.16 (5.99)		
Old	57	0-20	5.51 (6.30)		
Total	181		6.19 (6.29)	1.08	.01

Note: LEC-Orig = LEC original items. LEC-SLS = Surf lifesaving specific items. SS Sig. Other = Social support Significant other subscale. SS Whanau = Social Support Family/Whanau/Friends subscale. SS SLS Peers = Social support Surf Lifesaving Peers subscale. SS Patrol Capt = Social Support Patrol Captain sub scale. SS Peer Worker = Social support Peer Support Worker subscale. Min – Max Score = minimum and maximum score for each measure in this study. *F* = *F*-test statistic for the difference between mean scores for each age group. * = $p < .05$, ** = $p < .001$. η^2 = Eta squared.

Appendix D

Extended Correlational Analyses Including Subscales

Table. 1. Pearson Product Moment Correlation for Posttraumatic Stress, Posttraumatic Growth, and Trauma Exposure Subscales

Measure	1	2	3	4	5	6	7
1. LEC-Total	-						
2. LEC Orig.	.75**	-					
3. LEC SLS	.92**	.52**	-				
4. PCL-5	.10	.20**	.02	-			
5. PTGI-SF	.13	.20**	.07	.34**	-		

Note. $n = 181$. LEC-5 = Life Events Checklist – 5 Total. LEC Orig. = LEC-5 Original items. LEC SLS = Surf Lifesaving Events. PCL-5 = Posttraumatic Stress Checklist – 5 Total. PTGI-SF = Posttraumatic Growth Inventory Short Form Total. ** $p < .001$

Table. 2. Pearson Product Moment Correlations for SS Subscales, PTSD and PTG

Measure	1	2	3	4	5	6	7	8
1. PCL-5	-							
2. PTG	.34**	-						
3. SS Total	-.06	.23**	-					
4. SS Sig.Other	-.08	.17*	.64**	-				
5. SS Whanau	-.06	.20**	.71**	.36**	-			
6. SS SLS Peers	-.02	.16*	.76**	.20**	.41**	-		
7. SS Patrol Cap	.01	.12	.76**	.15	.37**	.63**	-	
8. SS PeerWork	.05	.18*	.29**	.16*	.11	.21**	.33**	-

Note. PCL-5 = Posttraumatic Stress Checklist – 5. PTG = Posttraumatic Growth Inventory Short Form. SS = Social Support. SS Sig. Other = Social Support Significant Other. SS Whanau = Social Support Family/Friends/Other. SS SLS Peers = Social Support Surf Lifesaving Peers. SS Patrol Cap. = Social Support Patrol Captain. SS Peer Worker = Social Support Peer Support Worker. ** $p < .001$ * $p < .05$

Appendix E

Online Survey

Demographics

Demographics

What is your current age?

- Younger than 16
- 16-19 years
- 20-24 years
- 25-29 years
- 30-34 years
- 35-39 years
- 40-44 years
- 45-49 years
- 50-54 years
- 55-59 years
- 60 years or older

What is your gender?

- Male
- Female
- Other (please specify)

Which ethnic group/s do you belong to?

- New Zealand / European
- New Zealand Maori
- Pacific Islander
- Asian
- Other

How many years have you been a surf lifesaver?

Are you paid or volunteer?

- Paid
- Volunteer

Do you intend on continuing surf lifesaving next summer?

- Yes
- No
- Unsure

If you answered no or unsure, please give a brief reason why:

What region of New Zealand do you currently live in?

- Northland
- Auckland
- Waikato
- Bay of Plenty
- Gisborne
- Hawke's Bay
- Taranaki
- Whanganui - Manawatu
- Wellington
- Nelson - Tasman
- Marlborough
- West Coast
- Canterbury
- Otago
- Southland

Stress events

Listed below are a number of difficult or stressful things that sometimes happen to people.

For each event check one or more of the boxes to the right to indicate that:

- (a) it happened to you personally;
- (b) you witnessed it happen to someone else;
- (c) you learned about it happening to a close family member or close friend;
- (d) you were exposed to it as part of your job (for example, paramedic, police, military, or other first responder);
- (e) you're not sure if it fits; or
- (f) it doesn't apply to you.

You can select either under 18 years old, or 18 and over, to indicate how old you were when you experienced the event. You can select both if you have experienced that event during both time frames.

	Events						Age of experience	
	Happened to me	Witnessed it	Learned about it	Part of my job	Not sure	Doesn't apply	Under 18	18 or older
Natural disaster (for example, flood, hurricane, tornado, earthquake)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire or explosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation accident (for example, car accident, boat accident, train wreck, plane crash)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serious accident at work, home, or during recreational activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exposure to toxic substance (for example, dangerous chemicals, radiation)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Listed below are a number of difficult or stressful things that sometimes happen to people.

For each event check one or more of the boxes to the right to indicate that:

What region of New Zealand do you currently live in?

- Northland
- Auckland
- Waikato
- Bay of Plenty
- Gisborne
- Hawke's Bay
- Taranaki
- Whanganui - Manawatu
- Wellington
- Nelson - Tasman
- Marlborough
- West Coast
- Canterbury
- Otago
- Southland

Stress events

Listed below are a number of difficult or stressful things that sometimes happen to people.

For each event check one or more of the boxes to the right to indicate that:

- (a) it happened to you personally;
- (b) you witnessed it happen to someone else;
- (c) you learned about it happening to a close family member or close friend;
- (d) you were exposed to it as part of your job (for example, paramedic, police, military, or other first responder);
- (e) you're not sure if it fits; or
- (f) it doesn't apply to you.

You can select either under 18 years old, or 18 and over, to indicate how old you were when you experienced the event. You can select both if you have experienced that event during both time frames.

	Events						Age of experience	
	Happened to me	Witnessed it	Learned about it	Part of my job	Not sure	Doesn't apply	Under 18	18 or older
Natural disaster (for example, flood, hurricane, tornado, earthquake)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire or explosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation accident (for example, car accident, boat accident, train wreck, plane crash)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serious accident at work, home, or during recreational activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exposure to toxic substance (for example, dangerous chemicals, radiation)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Listed below are a number of difficult or stressful things that sometimes happen to people.

For each event check one or more of the boxes to the right to indicate that:

- (a) it happened to you personally;
- (b) you witnessed it happen to someone else;
- (c) you learned about it happening to a close family member or close friend;
- (d) you were exposed to it as part of your job (for example, paramedic, police, military, or other first responder);
- (e) you're not sure if it fits; or
- (f) it doesn't apply to you.

You can select either under 18 years old, or 18 and over, to indicate how old you were when you experienced the event. You can select both if you have experienced that event during both time frames.

	Events						Age of experience	
	Happened to me	Witnessed it	Learned about it	Part of my job	Not sure	Doesn't apply	Under 18	18 or older
Other unwanted or uncomfortable sexual experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Combat or exposure to a war-zone (in the military or as a civilian)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Life-threatening illness or injury	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Happened to me	Witnessed it	Learned about it	Part of my job	Not sure	Doesn't apply	Under 18	18 or older
Severe human suffering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sudden violent death (for example, homicide, suicide)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sudden accidental death	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serious injury, harm, or death you caused to someone else	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>

Listed below are a number of difficult or stressful things that sometimes happen to people. The items below are related to surf lifesaving events.

For each event check one or more of the boxes to the right to indicate that:

- (a) it happened to you personally;
- (b) you witnessed it happen to someone else;
- (c) you learned about it happening to a close family member or close friend;
- (d) you were exposed to it as part of your job (for example, paramedic, police, military, or other first responder);
- (e) you're not sure if it fits; or
- (f) it doesn't apply to you.

You can select either under 18 years old, or 18 and over, to indicate how old you were when you experienced the event. You can select both if you have experienced that event during both time frames.

	Events						Age of experience	
	Happened to me	Witnessed it	Learned about it	Part of my job	Not sure	Doesn't apply	Under 18	18 or older
Successful search for missing people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unsuccessful search for missing people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Body retrieval	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Successful resuscitation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unsuccessful resuscitation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Happened to me	Witnessed it	Learned about it	Part of my job	Not sure	Doesn't apply	Under 18	18 or older
Complex and/or life threatening rescue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Complex and/or life threatening medical event	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Events						Age of experience	
	Happened to me	Witnessed it	Learned about it	Part of my job	Not sure	Doesn't apply	Under 18	18 or older
Traumatic injury requiring medical attention (for example, exposed wound)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Any other very stressful event or experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>

Stress level

Below is a list of problems that people sometimes have in response to a very stressful experience. Keeping your worst event in mind, please read each problem carefully and then select one of the choices to the right to indicate how much you have been bothered by that problem in the past month.

In the past month, how much were you bothered by:

	Not at all	A little bit	Moderately	Quite a bit	Extremely
Repeated, disturbing, and unwanted memories of the stressful experience?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Repeated, disturbing dreams of the stressful experience?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling very upset when something reminded you of the stressful experience?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoiding memories, thoughts, or feelings related to the stressful experience?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble remembering important parts of the stressful experience?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blaming yourself or someone else for the stressful experience or what happened after it?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Below is a list of problems that people sometimes have in response to a very stressful experience. Keeping your worst event in mind, please read each problem carefully and then select one of the choices to the right to indicate how much you have been bothered by that problem in the past month.

In the past month, how much were you bothered by:

	Not at all	A little bit	Moderately	Quite a bit	Extremely
Having strong negative feelings such as fear, horror, anger, guilt, or shame?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loss of interest in activities that you used to enjoy?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling distant or cut off from other people?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Not at all	A little bit	Moderately	Quite a bit	Extremely
Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Irritable behavior, angry outbursts, or acting aggressively?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taking too many risks or doing things that could cause you harm?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being "super alert" or watchful or on guard?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling jumpy or easily startled?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having difficulty concentrating?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble falling or staying asleep?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Life Changes

Indicate for each of the statements below the degree to which this change occurred in your life as a result of the crisis/disaster, using the following scale.

- I did not experience this change as a result of my crisis.
- I experienced this change to a very small degree as a result of my crisis.
- I experienced this change to a small degree as a result of my crisis.
- I experienced this change to a moderate degree as a result of my crisis.
- I experienced this change to a great degree as a result of my crisis.
- I experienced this change to a very great degree as a result of my crisis.

	I did not experience this change my crisis	I experienced this change to a very small degree	I experienced this change to a small degree	I experienced this change to a moderate degree	I experienced this change to a great degree	I experienced this change to a very great degree
I changed my priorities about what is important in life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a greater appreciation for the value of my own life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to do better things with my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a better understanding of spiritual matters.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a greater sense of closeness with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I established a new path for my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know better that I can handle difficulties.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a stronger religious faith.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I discovered that I'm stronger than I thought I was.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I learned a great deal about how wonderful people are.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Stress Support

These are questions about the sorts of support that you may receive from different people. For each question which follows, please select the choice that applies for you for each support group.

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

	Very little	A little	Some	A lot	A great deal	Not applicable
A Significant other (e.g. spouse/closest friend)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family/Whanau/Friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surf Lifesaving Peers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very little	A little	Some	A lot	A great deal	Not applicable
Patrol Captain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peer Support Worker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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

	Very little	A little	Some	A lot	A great deal	Not applicable
A Significant other (e.g. spouse/closest friend)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family/Whanau/Friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surf Lifesaving Peers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patrol Captain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peer Support Worker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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

	Very little	A little	Some	A lot	A great deal	Not applicable
A Significant other (e.g. spouse/closest friend)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family/Whanau/Friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surf Lifesaving Peers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patrol Captain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peer Support Worker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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

	Very little	A little	Some	A lot	A great deal	Not applicable
A Significant other (e.g. spouse/closest friend)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Family/Whanau/Friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surf Lifesaving Peers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patrol Captain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peer Support Worker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Coping Solutions

Please indicate how true each of these statements are to you.

	Not true at all	Hardly true	Moderately true	Exactly true
I can always manage to solve difficult problems if I try hard enough.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If someone opposes me, I can find the means and ways to get what I want.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy for me to stick to my aims and accomplish my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am confident that I could deal efficiently with unexpected events.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thanks to my resourcefulness, I know how to handle unforeseen situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can solve most problems if I invest the necessary effort.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can remain calm when facing difficulties because I can rely on my coping abilities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am confronted with a problem, I can usually find several solutions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I am in trouble, I can usually think of a solution.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can usually handle whatever comes my way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End

Thank you for your time and consideration in this survey. If you experience any distress after completing this survey you can talk to your GP, a registered psychologist or counsellor. There will be a cost for these services. Alternatively you can call Youthline (0800376633 – Free Text 234) or Anxiety New Zealand Trust (0800 ANXIETY) toll free.

If you would like to go into the draw to win one of 10 x \$40 Prezzy Cards and/or get a copy of the study summary once completed, please click on the submit button below to enter a separate anonymous survey page and enter your contact details.