

TEACH^R

After the earthquake: Adult reflections on adolescent experiences of a natural disaster

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Abstract

This 'living memory' study (Smith, 2018, p. 78) investigated the perceived psychoemotional experiences of four senior high school students at one Christian school during and after the February 22, 2011, Christchurch New Zealand earthquake. The literature revealed that children and adolescents might be impacted socially, emotionally and academically by earthquakes, resulting in mental health issues ranging from post-traumatic stress disorder to post-traumatic growth in the victims. Using a qualitative case study and narrative inquiry approach, participants were interviewed seven years after the earthquake. Responses were qualitatively analysed, and coded allowing for the emergence of an Earthquake Impact Profile (EIP) for each respondent. These profiles revealed several mitigating factors that helped the participants personally cope with the stress immediately after the earthquake struck, and in the following months and years.

Introduction: *kia kaha* (stay strong)

This study had a nested twofold purpose: firstly to investigate the perceived psycho-emotional reactions of four senior high school students at one Christian school during and after the February 22, 2011,

Christchurch New Zealand earthquake (hereafter referred to as the Christchurch earthquake): secondly, to use this qualitative data set to develop a set of Earthquake Impact Profiles (EIPs) for each participant in order to coalesce the "shared brokenness and reassemblage of the rhizomic reach of trauma" (Smith, 2018, p. 78).

Three questions were developed in order to guide and frame this study.

1. What support did the students access post-disaster and how did this impact them?
2. What were the self-identified psychoemotional impacts on the students?
3. What was the self-identified academic impact on each of the students?

Kia kaha (stay strong) became a popular phrase after the 6.3 magnitude Christchurch earthquake that killed 185 people (O'Connor & Takahashi, 2014; Shepherd, McBride & Lovelock, 2017). As Du Plessis, Sutherland, Gordon and Gibson (2015) found, this cultural, phraseology *kia kaha* became a symbol of resilience and hope for people experiencing the destruction of their city. Embracing the metaphoric intent of these words, school communities, at least outwardly, seemed to pull together and combine forces to help rebuild their damaged schools (Ormandy, 2014). For weeks after the earthquake, schools were without power and water while some had buildings that needed to be torn down. Others had broken windows and

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resources that littered their classrooms (Ormandy, 2014; Havell, 2012). This impacted both the mental wellbeing of the teachers and the students. As indicated *kia kaha* was the phrase used to remind earthquake victims that regrowth and strength are within them, and that while the journey is long, there can be an end (Barrer, 2012). However, is there ever a psychoemotional end to tragedies such as the Christchurch earthquake? While clearly implying the jury is still out regarding this point, Ruti (2014) believes “our personalities always carry the nostalgic trace of our losses” (p. 40).

Seven years after the Christchurch earthquake, this qualitative study investigated four young adults’ retrospective memories of life immediately after the earthquake and its ongoing repercussions. All four were senior high school students in one Christian school at the time of the earthquake. The rationale for choosing an in-depth ‘living memory’ (Smith, 2018) method for the study of the immediate and long term effects on adolescents was threefold. First, the primary researcher had a particular interest in the earthquake, having survived it. Second, following on from this ‘lived experience’ (Clandinin & Connelly, 2000), it became clear that the literature pertaining to how natural disasters impact adolescents was limited compared to studies that explore the impact on adults. As adolescence can be a period of ambiguity, a time of life when identity and world view are being shaped and in particular wellbeing aspects such as resilience are formed, this area of research needs expanding. Third, there are few post-earthquake studies where an adolescent experience is ideationally developed and then critically examined through recall and reflection.

Review of the literature: *kōrure* (to change)

The distress caused by natural disasters impacts millions of people globally every year. Natural disasters disrupt daily life, demolish infrastructure and can result in injury, displacement and death (Falcone & Detty, 2015). In unique ways not fully understood, this aftermath disruption of morbidity and mortality are mitigated by geography, climate, structural and political resources, and socioeconomic status (Kahn, 2005). As highlighted by newscasts and social media the very old, the very young, and those in lower socioeconomic classes are typically framed as experiencing the worse outcomes from a natural disaster (Falcone & Detty, 2015).

Major earthquakes are one of the most devastating of natural disasters (Khatri, Tran, Baral & Fisher, 2018). Mutch (2015) explains the uniqueness of earthquakes as follows.

What differentiates earthquakes from other disasters

is that they are unpredictable and uncontrollable. They are elusive, in the sense that the causes are hard to see but the effects are highly visible. There is no warning and no set endpoint. On-going aftershocks continue to cause physical and psychoemotional damage long after the initial event. (p. 39)

Impacts of earthquakes on wellbeing

There are three broad areas where earthquakes impact humans: physical impacts, societal impacts and psychoemotional impacts. Physical impacts involve everything from minor injuries through more serious injuries to death, all of which may occur swiftly (Bartels & VanRooyen, 2012). These injuries may be life changing both in the short and long term. In Christchurch, 185 people died and 7171 were injured (Potter, Becker, Johnston & Rossiter, 2015), straining the health care services. Societal impacts are characterised by a loss of infrastructure, destruction of community and workspaces and a changing landscape wrought by geological process. Impacts of the 2011 Christchurch earthquake included land level changes, liquefaction, increased risk of flooding, rock falls, landslides, and air and water quality issues, along with contaminated land (Potter, Becker, Johnston & Rossiter, 2015). Added to this was the uncertainty of ongoing aftershocks.

While the physical and societal impacts of earthquakes are devastating, even those individuals who may be physically unscathed can experience negative psychoemotional reactions. It is in this area that the majority of post-earthquake research has taken place (Silwal, Dybdahl, Chudal, Sourander & Lien, 2018). It is becoming increasingly clear that natural disasters negatively affect the mental wellbeing of adults, adolescents and children in the months and years after the disaster. Post-earthquake impacts on children and adolescents have been observed to vary greatly, ranging along a continuum from post-traumatic stress disorder (PTSD) to post-traumatic growth (PTG) (Bartels & VanRooyen, 2012; Dyregrov, Yule & Olf, 2018; Brown et al., 2017; Kar, 2009; Mutch and Garwith, 2014; Tang, Liu, Liu, Xue & Zhang, 2014).

Post-traumatic stress disorder

Clearly, post-traumatic stress disorder (hereafter termed PTSD) has the greatest research focus, revealing that the negative psychoemotional reaction children experience in the wake of an earthquake is a web of anxiety which includes intense feelings of nervousness, fear and sometimes anger (Kar, 2009). Unless treated, this may result in depression or other mental health disturbances (Kar, 2009). As mentioned previously, earthquakes can have long-term consequences for survivors (Arnberg, Johannesson & Michel, 2013; Khatri et al., 2018;

“
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Mutch, 2015; Neria, Nandi & Galea, 2008; Sezgin & Punamaki, 2012). Furthermore, exposure to earthquake-related traumatic events increases the risk of psychoemotional disorders, including PTSD. While these conditions are devastating enough, Bonanno, Brewin, Kaniasty and Greca (2010) have also linked PTSD to compromised academic achievement.

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Post-traumatic growth
Despite the weight of evidence revealing the negative mental health impact of natural disasters, there is another form of impact which is less discussed. It would appear that not all who experience natural disasters suffer long-term negative psychoemotional impacts. Post Traumatic Growth (hereafter termed PTG) is evident in some individuals who have experienced trauma (Bernstein & Pfefferbaum, 2018), where PTG manifests as improved change in an individual's personal life after exposure to a traumatic event (Bernstein & Pfefferbaum, 2018; Janoff-Bulman, 2004; Tedeschi & Calhoun, 2014). PTG appears to have the characteristics of resilience and includes the idea of bouncing back; however, in this case bouncing back to a higher level of wellbeing than before the trauma occurred (Winstanley, Hepi & Wood, 2015). Thus, this PTG wellbeing aspect includes feeling more capable and stronger which leads to greater confidence, strengthening of relationships and developing a better outlook on life. Calhoun and Tedeschi (2014) have identified five possible PTG growth domains which include “personal strength, new possibilities, relating to others, appreciation of life, and spiritual change” (p. 5). Combined, these factors may contribute to PTG over a period of time up to nearly two decades (Bernstein & Pfefferbaum, 2018; Meyerson, Grant, Carter & Kilmer 2011; Cryder, Kilmer, Tedeschi & Calhoun, 2006). Few of these studies have been directly linked to adolescents (Bernstein & Pfefferbaum, 2018; Cryder et al., 2006).

Mitigating factors on post-trauma wellbeing
The literature reveals several mitigating aspects related to post-trauma wellbeing which include the quality of social connections (Fergusson, Boden, Horwood & Mulder, 2015; Powell & Thompson, 2016; Revenson & Lepore, 2012), personality, dispositional optimism (Scheier & Carver, 1985), and the nature of the immediate social environment (Revenson & Lepore, 2012). In specific terms, Terranova, Boxer and Morris (2009) found that secure and safe family support minimises the risk of PTSD in children.

While there is a developing set of research data describing the process of mitigation in the previous findings, an interesting core thread appears to have arisen in the school based work of Bateman and

Danby (2013) who found that “story-telling sequences help both children and teachers to recover from their traumatic experiences” (2013, p. 6). Linked to the findings of the need for social support, storying gives both a voice to the victims and a community with which to share their anxiety (Mutch & Gawith, 2014). Prior to this, Leek Openshaw (2011) came to a similar conclusion, and added that creative expression through journaling, art and music were also valid ways for students to process their emotions. Long and Wong (2012) concur, but, indicated that children also need connections beyond school to the wider community and their families. It would appear that these aspects in tandem with social support assist students in the development of resilience after a traumatic event and can contribute to a lower rate of PTSD symptoms (La Greca, Silverman, Vernberg & Prinstein, 1996).

Pockets of research after the Christchurch earthquake identified the belief system of individuals as a mitigating factor in trauma. For some, the earthquake heightened spiritual thinking and they found comfort and potential answers in their faith (Sullivan & Wong, 2011; Peres, Moreira-Almeida, Nasello & Koenig, 2007). Similarly, data related to other earthquakes reveal that belief systems “can serve as a source of resilience and strength during a disaster and in its aftermath” (Furman et al., 2016, p. 75). Furthermore, individuals who connect to a belief system post-disaster are less at risk for developing a negative mental health disorder such as PTSD (Blanc, Rahill, Laconi, Mouchenik, 2016; Jakovljević et al., 2012).

While post-trauma psychoemotional and related issues in the aftermath of earthquakes are the topic of widespread investigation, there is still scope to explore this topic in the context of the experiences of adolescents looking back at an experience in which they were involved.

Research design: akoranga (learning)

The overarching paradigm for this research project was qualitative, under which a bricolage of case study (Yin, 2014) and narrative inquiry was interwoven (Clandinin & Connolly, 2000). This methodology was deemed to be optimal in understanding the whole experience of the earthquake (Flick, 2014; Van Manen, 2016), allowing deeply personal and tacit richness and raw expression of the participants' lived experience, and 'living memories' (Clandinin & Connolly, 2000; Smith, 2018) to be captured. As Barbour (2014) posits, there can be no 'objective' singular truth in traumatic events as each individual has their own reality and validates their experiences. The stories that they share have the potential to educate the self and

others, including researchers who aim to understand the personal response to a traumatic event, and the context that surrounds the event (Webster & Mertova, 2007). This choice of method allows for flexibility and fluidity while venturing into new territories of understanding and knowledge (Minichiello & Kottler, 2009).

Participation in this project was based on a purposeful sample of students who met the criteria of being senior students at a designated Christian school in Christchurch during the 2011 earthquake. All were at school when the earthquake struck. Anonymity, confidentiality and freedom of participation were ensured with ethics approval for the research. Three participants were female, and one was male.

Data were gathered through semi-structured interviews. This allowed a unique negotiation between the researcher and the participant as stories were told, retold and reaffirmed (Webster & Mertova, 2007; King & Horrocks, 2010). The analysis followed a modified grounded theory approach which allowed a small sample size (Charmaz, 2014; Glasser, 1998; Birks & Mills, 2013). The interviews were transcribed and coded through three levels (Charmaz, 2014) and from this process themes emerged which formed the basis of three Earthquake Impact Profiles (EIPs) for each participant. The EIPs were then used to respond to the research questions.

Results: kōrero pono (honest narrative)

Individual participant EIPs have been reported using tables which take the form of a shaded analysis matrix, supported by participant comments that provide rich data. Data has been reported in three distinct areas to facilitate comparisons encompassing all the data, and to form responses to the research questions.

Question One: Mitigating support networks

What support did the students access post-disaster and how did this impact them?

Table 1 provides an overview of the support networks the participants relied on post-earthquake. Each participant’s responses have been represented in the form of a shaded matrix to visually present the extent to which they relied on the identified support networks.

In this investigation, family and friends featured as a support network for all the participants, especially in the initial, traumatic days following the earthquake. *“I remember that I never wanted to go anywhere without my mum, like, I resorted back to (it) being a child...I didn’t want to be alone”* (A, ♀). This participant also relied heavily on her grandparents who lived with them at the time.

The support of the community was equally highly valued, with mention of neighbourhood support. *“When we got home from the earthquake... someone had already made soup... so they gave out soup to everyone which was really nice”* (B, ♀). Participant D (♀) noted that while they were shoveling silt, *“one lady dropped off some muffins,”* yet none of the participants identified their school specifically as a support network (See Table 1). Reflective comments indicated that participants felt their school could have done more to support them in the weeks and months after the earthquake. In retrospect, the participants felt they would have benefited from access to an independent counsellor: *“I don’t think there was any ... counselling services open to us”* (A, ♀), *“I do think that they should have made a bigger effort to get a counsellor,”* and *“It probably would have been good to have talked about it”* (B, ♀). Although the school

“ none of the participants identified their school specifically as a support network ”

Table 1: Participant EIPs for support networks

Support Network	Participant A ♀	Participant B ♀	Participant C ♂	Participant D ♀
Friends and Family	Dark Blue	Light Green	Dark Blue	Dark Blue
Community	Dark Blue	Dark Blue	Dark Blue	Light Green
Belief System	Dark Blue	Light Green	Dark Blue	Light Green
Involvement in service	Light Green	Participant left Christchurch	Light Green	Dark Blue

Key ■ Participant viewed support network as very important ■ Participant viewed support network as somewhat important ■ Participant made no reference to this support network

did have its own counsellor, who tried to encourage and support, the participants felt the service offered was inadequate for the number of students. They also felt a need for group sessions where they could discuss the impact of the earthquake on themselves and others. One participant commented that he didn't "really remember having any conversations with people or sitting down and processing what it was like, or anything like that in any way" (C, ♂). One participant also felt that after they returned to school, "I think the culture was to, like, ignore it (B, ♀) and act like everything was totally normal" (B, ♀). In retrospect, Participant A remembered thinking at the time, "Are you for real; there was an earthquake!" (A, ♀). Considering these responses, it appears it was the wider community (media; national and local government; churches and associations; local neighbourhoods and individuals) beyond the school that was more significant in supporting these students than their school community.

All participants relied to a certain extent on their belief system to support them post-earthquake, though this had its challenges as indicated by the following comments.

It was hard to continue my positive look on life with the Lord on my side. It just, it was really hard ... I started to see slowly what the Lord had really done for us ... it was a slow thing ... I started to really praise God when I finally got out and saw what had happened. (A, ♀)

One participant asked, "Why was it that person's time to die and not mine?" (B, ♀), while another commented, "It may have even strengthened my relationship with God... in a little bit of in a way" (C, ♂). One participant felt that "spiritually it was really wholesome for me to get the opportunity [to serve], even though it was really sad" (D, ♀).

Involvement in service featured in the interviews of three participants, with one participant speaking very favourably of the support she felt when engaged in helping her community. The fourth participant (See Table 1) was sent to another city to stay with friends so did not join in community service projects. Of the participants who stayed and helped, this comment sums up the impact of service on their own wellbeing.

I think there is something particular about helping others that just makes you feel more human, which sounds really weird but it really makes you feel more complete and whole when you're doing something for someone else and not expecting a return or anything for that service (D, ♀).

All those interviewed felt that family and friends, the wider community, their belief system and community service offered support during the post-earthquake days. There was less agreement on the

role that their school played as a support structure.

Question Two: Psychoemotional reactions

What were the self-identified psychoemotional impacts on the students?

Table 2 provides an overview of the self-identified psychoemotional impacts on the participants immediately after the earthquake and in the months and years following it. The first three items relate to PTG and the remaining five elements are identified in the literature as relating to PTSD.

Collectively, the participants identified three psychoemotional reactions that moved them towards PTG. Resilience was an emerging characteristic in the interviews with all four participants indicating moderate to high impact on this trait, as indicated by this comment.

I think it's brought closure in a more positive way in my life because seeing the city go through something so terrible and then seeing it come out afterwards and what it's like now and what it's going to be in the future has kind of just made the situation less upsetting and more hopeful (D, ♀).

Self-reliance was also evident with one participant feeling that "it was me just supporting myself, and that's not because other people didn't want to but it was just because I didn't really, you know, I didn't really ask for help" (B, ♀). The participant who was formally diagnosed with PTSD (A, ♀), however, claimed little or no self-reliance. All participants remember comparing their reactions at the time to others in similar situations, "and when I looked around, I saw people who were struggling much more outwardly than I was. So if people asked if I was all right, I would have just said I was fine" (C, ♂). This participant is still living with reactions to sounds and movement and retrospectively feels that "maybe if I had processed earlier [it] may have been able to help with that" (C, ♂). All participants recognised some PTG as a positive outcome of their earthquake experience.

Between them, the participants identified a total of four psychoemotional reactions that moved them towards PSTD (See Table 2). Each participant was impacted in unique ways by their 'reactioning' to different extents, so forming personal profiles. After the event, three participants identified that suppressing their emotions had impacted them, although they did not recognise this at the time. One participant acknowledged, "I was always one of those kids that kept things to themselves and didn't like to talk about things that you're struggling with and things

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Table 2: Participant EIPs for self-identified psychoemotional reactions

Self-identified psychoemotional reaction	Participant A ♀	Participant B ♀	Participant C ♂	Participant D ♀
Self-identified psychoemotional reactions related to PTG				
Resilience	High	Moderate	Moderate	High
Self-reliance	Low	High	Moderate	Moderate
Comparison to others	Moderate	Moderate	High	High
Self-identified psychoemotional reactions related to PTSD				
Suppression	Moderate	High	High	High
Worry/anxiety	High	High	High	Low
Fear	High	Moderate	Moderate	Low
Anger	Low	Moderate	Low	Moderate

Key ■ Participant self-identified as high impact reaction ■ Participant self-identified as moderate impact reaction ■ Participant self-identified as no to low impact reaction

“Most participants experienced high impact worry/anxiety ... moderate to high fear ... but only two ... experienced anger”

that you're going through" (B, ♀).

Most participants experienced high impact worry/anxiety (but not D), moderate to high fear (but not D), but only two (B and D) experienced anger and then only with moderate impact. One said of aftershocks, "there's that anxiety builds up ... where it's like, is this going to get worse?" (C, ♂). Another admitted, "I got too scared even to go to the toilet by myself" (A, C). Along with fear came anger. "I think I reacted with anger weirdly enough, and it has made me a bit anxious to go out by myself" (B, ♀). Participant A (♀) was the only person who acknowledged experiencing PTSD, and who was formally diagnosed. Words and phrases used by this participant confirmed this diagnosis. "Never wanted to go anywhere ... didn't want to be alone ... too scared ... what if something happened ... too terrified ... I was really anxious and panicky for a while... I would wake up with uncontrollable shakes" (A, ♀).

In summary, each participant self-identified a range of psychoemotional reactions which varied in intensity and duration and worked to move them either towards PTG or PTSD. The level of psychoemotional reaction, suggests three (A, B, C) experienced PTSD related reactions overall, and

only D experienced PTG as a dominant outcome. No obvious relationship between Support Networks and Self-identified Psychoemotional Responses is apparent, though D reported a lower importance for networks and the lowest emotional impact. The lower negative emotional impact for D is potentially associated with higher PTG and the uniquely higher valuing of involvement in service networks.

Question Three: Impact on education

What was the self-identified academic impact on each of the students?

Table 3 indicates the varying impact on each individual's perceived academic achievement post-earthquake.

Individual comments reveal a variety of responses to the self-identified impact on the respondents' academic performance and refer to the modifications allowed for final year students. One student felt her last year of high school was "really hard". She didn't pass and commented, "I felt like I had been robbed" (A ♀), although she also admitted that she "struggled" before the earthquake.

In contrast, another participant didn't think it "impacted my grades or anything, it just, it was like another burden to carry... . It was disruptive" (B ♀). Participant C remembers "being completely over it" [school], and further offered that, "Now that I look back at it ... it must have impacted me because I don't actually recall much of my final year of being at school" (C ♂). The least academic progress impact was reported by B and D. Overall both valued networks less and indicated high to moderate self reliance. For the most part, the degree of impact on schooling aligned with each participant's perceived PTSD associated psychoemotional impact of the earthquake, participant B, however, being an exception. No relationship between impact on academic progress and overall valuing of support networks was apparent.

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Discussion: tūhuratanga (discovery, revelation)

In answering the research questions, three areas contributed to each participant's Earthquake Impact Profile (EIP)—mitigating support networks, self-identified psychoemotional reactions and self-identified academic performance. Participants identified the mitigating role of support networks on their psychoemotional reactions, which, in turn, may have contributed to their perceptions of academic performance in 2011 and beyond.

Mitigating support networks

All four participants recognised the influence of multiple mitigating support networks, in three unique combinations. The finding that friends and family offer very important support for adolescents post-earthquake agrees with studies that parental input makes a difference to how children deal with trauma (Long & Wong, 2012; Silwal et al, 2018). As the participants' stories were tracked in this study, it became apparent that a wide network of family and friends assisted adjustment to post-earthquake life. Participant A's family and friends' support network consisted primarily of her mother and grandparents, and in retrospect she felt that having others in her support group would have helped her cope better. Community was also a very important mitigator

for all participants and potentially included school and church communities amongst the broader elements of community. This concurs with Terranova et al. (2009), who posit that social support is the most important factor in mitigating PTSD. It was noted; however, that the recollections of organisational school support were of weaker influence. Lack of independent counselling services; limited opportunities for sharing and storytelling; and a reluctance to discuss the situation or listen to questions pertaining to faith were noted. On reflection, the participants felt they would have coped better if some of these strategies had been implemented. On the other hand, participants claimed school friends provided strong support for each other. Given the lack of warning when the earthquake struck, and the ongoing confusion in the following weeks, the school community was most likely doing the best it could to support both students and staff under very difficult circumstances.

Related to social support but emerging clearly as a separate support network in its own right, was involvement in community service. Three participants were actively involved in service. Involvement in service potentially strengthened community connections, self-identity and spirituality, and also reassured the participants as they helped restore the city. One participant highly valued her community service, while two others considered it to be somewhat important (See Table 1). Although community involvement has been studied in the context of natural disasters, most studies revolve around the benefits for infrastructure (Lawther, 2009), or motivation of volunteers (Barraket, Keast, Newton, Walters & James, 2013). Community service as a support network for emotional recovery is scant within the literature, although service has been identified by Leek Openshaw (2011) as a helpful post-trauma strategy. For the students involved, the opportunity to serve others provided purposeful activity which helped them cope to varying degrees. Community service as a support network is an area that deserves further consideration.

Support networks often overlapped, with participants finding this helpful. Sometimes

Table 3: Participant EIPs for self-identified academic progress post-earthquake

	Participant A ♀	Participant B ♀	Participant C ♂	Participant D ♀
Self-identified Academic Impact	High impact	No impact	Low impact	No impact

Key ■ High impact ■ Low impact ■ No impact

family members joined together in serving the community within community organisations and church congregations, a three way union that adds an additional dimension of service to the findings of Benson et al. (2015) and Sullivan and Wong (2012), that belief systems help provide comfort and community. While the belief systems provided very important to somewhat important comfort, and theological answers to why the earthquake happened, in some cases they also raised challenging questions for the participants to work through.

Most participants considered mitigating support networks as very important to them, with Participant D rating service involvement as very important, while the other two participants who became involved rated this network as somewhat important.

Self-identified psychoemotional reactions

Self-identified psychoemotional reactions covered everything from resilience to anger forming individualised participant profiles (see Table 2). Resilience and self-reliance which are contributors to PTG were attributed by participants to their support networks that provided social belonging and emotional support post-earthquake through family and church activities, including food distribution and cleanup, a prior finding within the literature (Fergusson et al., 2015). Self-reliance is a personality factor that can play a major role in the development of resilience as identified by Scheier and Carver (1985) contributing to PTG. This may explain participants attributing lower (moderate) impact to Self-reliance than both Resilience and capacity to compare personal need to that of others.

A reaction that is not apparent in the literature relates to how the participants compared themselves to others, and then acted accordingly. It may be that this is an adolescent trait, but it has implications as at least one of the participants (C ♂) felt he could have dealt with some issues that still bother him, if he had accepted help when it was offered, instead of seeing others worse off and refusing the help offered. Altruism expressed then, had a negative impact.

Suppression (a potential contributor to PTSD) was another coping mechanism that was recognised of high impact when reflecting during interviews, but not one that was always apparent during the event. On participant “*found it easier to go for counselling*” at her tertiary institution after schooling, and remembers “*that was a hard year too*” (A ♀). Participants felt that counselling, storytelling and sharing could have helped (Bateman & Dandy, 2013), but did not mention journaling, art and music activities as promoted by Leek Openshaw (2011).

All participants remembered experiencing worry/

anxiety, fear (moderate impacts) and/or anger (lower impact) in the days and weeks following the earthquake. This cluster of emotions is related with fear prompting worry or anxiety, and anger emerging as a result of worry or anxiety. There were high levels of worry, anxiety, fear and suppression that affected some of the the participants both short and long term. This is a finding supported by Neria et al. (2008) and Arnberg et al. (2013) who both identified that victims of natural disasters could experience impacts for six or more years after the event. While all could be assigned moderate overall impacts, only participant A was formally diagnosed with PTSD and anxiety. Her mitigating support structures though strongly recognised, were more restricted, and combined with predispositions influenced both her psychoemotional reactions profile (low PTG, high PTSD), and highly impacted academic progress. This supports the position of Powell and Thompson (2016) who found that smaller social support networks can contribute to a higher likelihood of PTSD. All participants identified that their support network could have included a professional counsellor or psychologist who had no affiliation with the school they attended. They all felt that this would have helped lessen the intensity and duration of their negative psychoemotional reactions and allowed them to share their stories and receive professional advice on how to move forward after the earthquake.

Impact on education

A range of psychoemotional reactions pushed the participants either toward PTG or PTSD and this effected their academic progress. It is important to note that the New Zealand government put measures in place for final year students to allow an aggregate score based on their performance pre-earthquake. One participant viewed this “*as improving my chances of getting a pretty good grade,*” at the same time admitting that “*it [the earthquake] was pretty disruptive*” (B ♀). This alleviated some stress about completing their final year of schooling. The only participant who was formally diagnosed with PTSD also felt severely impacted academically, a finding consistent with Bonanno et al. (2010). All other participants in this study experienced no to low impacts that only affected their academic outcomes for a short amount of time. This reflected their wider support networks which helped PTG and alleviated a strong negative psychoemotional reaction in all three of these other participants but most clearly in D, the participant attributing greatest importance to involvement in serving others.

As PTSD is more likely to adversely affect academic achievement and delay a return to normal functioning, this study highlights the importance of

“*The only participant who was formally diagnosed with PTSD also felt severely impacted academically, ... other participants ... experienced no to low impacts ... for a short amount of time*”

adequate support structures for the adolescents in this study. Though all valued support networks similarly as important, the actual adequacy and predispositions differentiated outcomes. In this study, support networks including community service, moved the senior high school students towards PTG and consequently fulfilled and happy lives after the earthquake. This was most apparent for participant D.

Recommendations

Although it is recognised that the data collected from four participants in one shared experience cannot be generalised, the collective data analysed in this study can be clustered into four recommendations. As the participants all attended one Christian school, the recommendations focus on the role of Christian schools that may find themselves dealing with the after-effects of an earthquake or other natural disasters.

The participants in this study recommend that schools intentionally act as a support to complement other support networks by:

1. creating opportunities for students to explore, in multiple ways, the relationship between their faith and their situation;
2. creating opportunities for involvement in age appropriate community service;
3. facilitating access to an independent psychologist or counsellor for all students post-earthquake, and furthermore, encouraging students to participate in either individual or group counselling; and
4. providing a nurturing environment for students and staff members where stories and experiences can be shared.

Conclusion: whakatepe (to finish off, conclude)

This qualitative investigation which analysed adult recollections of four adolescent experiences during and after the 2011 Christchurch earthquake resulted in four unique EIPs. It identified the role of support networks, including involvement in community service, in helping the four participants cope with the aftermath of this disaster. The support networks served to ground the students in reality and helped to ameliorate the psychoemotional reactions of resilience, self-reliance and diminish more negative psychoemotional reactions. Flowing on from the psychoemotional reactions, a varied impact on academic achievement was found, ranging from no impact to high impact. Negative psychoemotional reactions with a limited support network resulted in a high negative impact on education and minimal or more positive psychoemotional reactions coupled with strong support systems resulted in low to no academic impact. This study, although limited in

its scope, reminds Christian schools to include intentional planning and service provision within formulated disaster and critical incident policies to most effectively integrate with, and complement, other social support networks protecting student wellbeing. **TEACH**

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“support networks including community service, moved the senior high school students towards PTG and consequently fulfilled and happy lives after the earthquake.”

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