Women's voices: Solace and social innovation in the aftermath of the 2010 Christchurch earthquakes

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Abstract

The Canterbury earthquakes and the rebuild are generation-defining events for twenty-first century Aotearoa/New Zealand. This article uses an actor network approach to explore 32 women's narratives of being shaken into dangerous disaster situations and reconstituting themselves to cope in socially innovative ways. The women's stories articulate on-going collective narratives of experiencing disaster and coping with loss in 'resilient' ways. In these women's experiences, coping in disasters is not achieved by talking through the emotional trauma. Instead, coping comes from seeking solace through engagement with one's own and others' personal risk and resourcefulness in ways that feed into the emergence of socially innovative voluntary organisations. These stories offer conceptual insight into the multivalent interconnections between resilience and vulnerabilities and the contested nature of post-disaster recovery in Aotearoa/New Zealand. These women gave voice to living through disasters resiliently in ways that forged new networks of support across collective and personal narratives and broader social goals and aspirations for Aotearoa/New Zealand's future.

Keywords

disaster, narratives, resilience, social innovation, solace, vulnerability, women

Introduction

This paper is about coping in a disaster. It is also about multiple models of resilience and vulnerability and how they relate to each other in academic debate and lived realities of coping. Official responses to the Canterbury earthquakes offered residents help predicated on a model of resilience that sees vulnerability as a hindrance to coping. Local response, or lack of response, to the official help suggests, at the very least, a mismatch between the support offered and what was actually needed, and the potential existence of different coping strategies. Approached through an actor network lens, the mismatch between official responses and their reception articulates the presence of and tensions between multiple assemblages of coping in the aftermath of disaster. Such tensions echo on-going research and unresolved debates in the disaster recovery literature over resilience's relationship to vulnerability. As a strategy to explore these debates in a way that can shed light on the mismatch, this paper examines how a group of socially innovative women narrate their own experiences and understandings of coping through the Canterbury earthquakes.

The first section describes the earthquakes and the mismatch between official coping support and responses to that offer of help. The author reflects upon this mismatch in light of her own experiences of both the earthquake and unexpected forms of coping advice to introduce the study. The second section discusses prevailing formulations of resilience and vulnerability in the literature to explain why an actor network theory approach was taken. The third section applies this strategy to a set of narratives of coping through the earthquakes. A model of coping is developed based on a distinctive articulation of the relationship between resilience

and vulnerability that helps explain the mismatch between official coping support and local responses to them.

The Canterbury earthquakes of 2010–2012

An earthquake in itself is not a disaster, it is merely a geological hazard that 'turns into a disaster by its *social effects*' (Guggenheim, 2014, p. 3). Dissected by several fault lines, Aotearoa/New Zealand is one of the most geologically active countries in the world. Its well-known seismic proclivity turned into a disaster early on the morning of September 4, 2010 when a hidden fault ruptured near Darfield, a rural Canterbury town in the South Island of Aotearoa/New Zealand. At magnitude (mag) 7.1[1], it was the most damaging earthquake since the 1931 mag 7.8 earthquake in Hawke's Bay and triggered 'a state of national emergency with large-scale military-led rescue and recovery operations' premised on a command and control institutional response (Wilson, 2013, p. 209). While no-one was killed in the Darfield quake, it heralded the beginning of a rare series of over 12,000 earthquakes, peaking in four seismic effects that combined to produce 'unusually strong ground-shaking in February 2011's mag 6.3 aftershock' (GNS Science, 2011) that hit the central city of Christchurch at lunchtime on February 22. Though smaller in magnitude, this earthquake had the world's highest ground velocity recorded, and many homes, businesses and infrastructures (vertical and horizontal) were crumpled (GNS Science, 2011). The city's population of over 300,000 struggled to get out of collapsed buildings; to contact family, friends and workmates; and to get to safety as tremors continued to roll through, each one as threatening as the last. The February collapses killed a reported 185 people[2], and hundreds more were badly injured by falling rubble and masonry (Claridge & McManus, 2015).

Within three weeks of the February 22, 2011 earthquake, I received a personal letter from an elderly relative, written on the 70th anniversary of the Clydebank Blitz of March 13 and 14, 1941. (For an account of the Clydebank Blitz, see McLeod, 2011.) Sitting in my sporadically trembling home, I read of a terrified 16-year-old's night spent running from falling incendiaries, fleeing hit buildings and clambering over rubble- and fire-blocked streets to reach her brother and parents mere hours before it all began again. As she recalled that 'we thought it was Armageddon', my hair stood on end. Her 86-year-old hand had precisely captured an atmosphere of fear and endurance that I instantly recognised. This retired teacher compressed seven decades of coping into four brief snippets of advice:

> So, Lesson 1 – become involved in seeing what you can do to overcome the problems. Lesson 2 – personally help others to overcome their problems. Lesson 3 – again become involved in the restorative work that ensues from disasters. Lesson 4 – realise that you will always be subject to the fear of a recurrence, but fear is nature's way of putting an individual on alert. It will be amazing how time will be an ingredient of coping … concentrate on accepting that the earthquake has emphasised stress, but keeping very active in mind and body acts as an antidote. My thoughts are with you and all those in New Zealand who have recently encountered a shattering experience. As Phoenix rose from the ashes, so too will you all. With much love… (E. Mackie, personal communication, 2011).

My aunt's story of coping arrived as early official recovery efforts were seen to fail. Beyond dealing with the actual physical risks and dangers, one of the key government strategies was to flood the city with grief and trauma counsellors. Dubbed 'The Flying Squad' (Miles, 2012), numerous certified counsellors arrived within the first days in Christchurch to do door-to-door triage assessments of the local population's emotional and psychological health. Within 2 weeks, many counsellors had left the city because they were idle. Apparently, the people of Christchurch were not interested in talking out their troubles with certified counsellors from elsewhere.

The unexpected local response to the Flying Squad and the pedagogical narrative from my relative got me thinking about what coping meant as I, alongside my colleagues, got on with the responsibilities of shepherding a cohort of university students through their various courses under the most unusual of circumstances, teaching in the car parks in large marquees that stank of cat urine and sweat and at times of fear, as aftershocks made the projector shiver and us all squirm and square ourselves over ensuing weeks that became months. We offered inventive ways to support exhausted students as their new living circumstances took hold and bit hard into their lives, as the demand for essay and exam performances continued unabated. The harsh realities of on-going exhaustion likewise drained our own capacities to research amongst the ever-shifting sands of an institution in flux. It was like working in the tidal range. Every 12 hours, it was washed away and had to be redone. Reflecting back, my body reminds me of having no energy or motivation to go out and research what was happening in our midst, because I was using what I had, to do what was required in new ways.

Frequently lauded for determination and resilience by no less than the Prime Minister (the Right Honourable John Key) and the United Kingdom's Prince William (One News, 2014), the vast majority of Cantabrians were (and still are) constantly told they're coping. At the same time, media reports, ordinary residents and researchers have queried what this coping means as efforts to rescue, repair, rebuild and recover strain (Eleven, 2013; Hayward, 2013; McCrone, 2015; McManus, Johnston, & Glavovich, 2015; van Heugten, 2014; Wilson, 2013). The question of what it means to cope in the aftermath of a disaster is the departure point for this paper.

The Women's Voices study

The clear disjuncture between national official and local coping strategies embodied in the lack of uptake of the Flying Squad, the pedagogical narrative I was sent by my aunt, and my own sense of what coping had to involve, spurred a curiosity about how other women saw themselves as coping. This curiosity led me to the Women's Voices oral history collection (Canterbury Earthquake Digital Archive [CEISMIC], 2012b). The Women's Voices project was conceived in July 2011 by members of the National Council of Women (NCW) to 'undertake its own research study into the effects of the earthquakes on local women' in recognition that 'men and women often occupy different spaces in disasters' (Gordon, 2013, pp. 415-416). What the NCW noticed in the early weeks after the earthquakes was that the work of women in the city 'appeared invisible' (Gordon, 2013, p. 416). The NCW were responding to a well-known aspect of disasters, which is that as an organising category of society 'gender comes into play across all dimensions of disaster prevention, response, and recovery', and through the organising effects of gender hierarchies, women and men experience disasters differently (Enarson, 2014, p. 37). This invisibility is seen as one of the effects of the gendered representation of women and men in popular culture, news reporting, institutional organisational response to, and theorisation on, disasters (CEISMIC, 2012a; Enarson, 2012; Houghton, 2009). As 'women's voices bring the underside of disaster to life' (Enarson, 2012, p. 18), the NCW's response was to initiate a life-histories project and generate 'an archive of stories of women of different ages, with different life experiences, from different parts of city'. This collection of narratives would be publicly accessible, available to future researchers, and a resource about the Canterbury quakes and their effects on people (Du Plessis, 2012, p. 1). As a women's organisation, the NCW was giving post-disaster support in ways that would further document that 'in many post-disaster recovery situations, women have been active in rebuilding their communities … and that they

outnumber men in the leadership and membership of emergent grass-roots groups working disaster issues' (Yonder, Akcar, & Gopalan, 2009, p. 190).

The project's aims were as follows:

> to understand women's experiences of the earthquakes through their own eyes, and in the context of their life experiences. The role of the researchers would be to lead the participant through her life story using a narrative approach. The interviews were in three parts: early life and before the earthquakes, the earthquakes (there were four major events, taken one by one) and life after the earthquakes. (Gordon, 2013, p. 416)

The Women's Voices project research design and methods were forged in a challenging post-disaster context of a 6-month social research embargo[3] and scarce research funds (Lee, 2014). Local women social scientists volunteered their time and expertise to interview women in their networks about their earthquake experiences. A small amount of funding supported the interview transcriptions and data collation. A key aspect of the project was rendering the women's accounts into a publicly available digital archive. This involved a two-stage ethical consent process. The first consent form indicated their agreement to be interviewed and recorded. The second consent form specified 'what could be archived and the conditions under which this archive material could be used' (Du Plessis, 2012, p. 8).

The first tranche of 32 interviews was conducted in November 2011 and focussed on women's formal and informal contributions to the well-being of families, neighbourhoods and communities since September 4, 2010. The interviews took place either in the women's homes or the homes of the interviewer, at the University of Canterbury or in available community rooms round the city, and more rarely in the women's workplaces (Du Plessis, 2012)[4]. Because of the networking technique used, the women interviewed in the first round tended to be 'relatively well-resourced professional women, with a pākehā (European White) bias' (Gordon, 2013, p. 417). These women had significant involvement in the initiation of socially innovative projects that responded to perceived needs in the immediate disaster aftermath. As would be expected, they recount experiences firmly shaped by their contextual positioning as women with social and economic resources (Gordon, Sutherland, Du Plessis, & Gibson, 2014). While the amount and profile of interviews is not statistically representative, and so none of the findings can be generalised across Aotearoa/New Zealand, they are still valuable because of the insights they bring to academic debate about what it means to cope post-disaster and disaster planning more generally.

This article is based on a secondary analysis of the first 32 interview transcripts, as it was not possible to 'produce a data set of comparable quality because of lack of time and resources' (Bryman, 2008, p. 295). All the content of each transcript was coded, covering the three parts of the interview. The software programme ATLAS TI was used to develop descriptive then explanatory codes and themes as a means of exploring the women's meaning-making associated with the broad concepts of coping, resilience and vulnerability. Given space restrictions, the analysis is presented through indicative quotes. As I am interested in what it meant to cope for these women, the analysis used actor network theory (ANT) as a theoretically informed lens that could pay attention to the connections between the official responses, their reflections on their experiences of the earthquake, and their accounts of coping.

Coping as a contested terrain in disaster studies

As a multi-disciplinary field, disaster studies span a panoply of debates, discussions and concerns that encompass land and social sciences, planning and policy (Paton & Johnston, 2015). While impossible to do justice to the field, there is an enduring concern with the definitions of and connections between risk, vulnerability and hazard that underpin social

science discussions of resilience. Resilience is seen to have originated in either engineering, ecology or psychology, and while it has spread outside its original disciplinary fields, the concept of resilience, particularly when it is associated with cindynics (hazard research) 'etymologically, refers to the idea of rebound' (Reghezza-Zitt, Rufat, Djament-Tran, LeBlanc, & Lhomme, 2012, p. 3). At a categorical level, resilience means to be able to withstand and/ or embrace the dreaded combination of the risks of hazards happening in ways that intersect with vulnerabilities, be they structural (Maskrey, 1989) and/or social (Enarson, 2007). It is generally accepted that resilience in some way refers to getting through damage, disruption and disaster. Debates on whether resilience is an outcome, a property or a process tend to cleave along research community lines that in turn apply the term to all manner of structural and non-structural (human) systems and expand it across topographical and temporal scales (Michael, 2014).

Guggenheim conceptualises the social science approach to disasters in terms of what kind of problem they pose – 'the first trend is to conceptualize disasters as ruptures and thus inherently *political* and second to conceive of them as *not* within society but still an object of sociology' (Guggenheim, 2014, p. 3). Two central movements in the sociology of disasters have consequently emerged. One is focussed on explaining stability and what holds society together. The other 'uses rupture to learn about the composition of the world' and in relation to disasters, pose questions about 'who should be allowed to re-compose the world and how' (Guggenheim 2014, p. 4). The social sciences community of disasters studies bring resilience, vulnerability, hazard and risk together in specific ways.

My examination followed the latter as I adopted an actor network approach drawn from Latour (1996, 2002) and Law (1991) to make sense of the disjuncture between official offers and responses to those offers, and of themes in the women's narratives associated with resilience, vulnerability, coping and their role in instigating socially innovative disaster responses. An ANT formulation of resilience and vulnerability would see them as emerging from actor networks, and that there would be multiple actor networks in contestation with each other. This approach therefore goes some way to explain the disjuncture between official and local approaches to coping. At the same time, as ANT analyses foreground non-human/human networks in the elaboration of their accounts, they also frame actants' agency as emergent with the understanding that people are 'nodes' that are significant translation points. This analytical approach offered a productive strategy to gain insight into the formation of coping, resilience and vulnerability.

Social capital and intersectional analyses dominate social science accounts of coping. They also pervade Aotearoa/New Zealand's Civil Defence & Emergency Management (CDEM) framework. While each formulates the relationship between resilience and vulnerability in specific ways, outlined below, ultimately, as both perspectives understand resilience as a property of pre-existing social networks, and as both approaches presume rather than explain social networks, neither can fully address what it means to cope in a post-disaster context.

Social capital dominates social science disaster research. A social capital approach to coping, resilience and vulnerability conceptualises the relationship between risk, hazard, resilience and vulnerability in terms of social networks. Aldrich, a leader in social capital approaches to disaster recovery, notes that 'the negative effects of disasters are concentrated in the most socially vulnerable populations, which include the poor, minority groups, women and the elderly' (Aldrich, 2011, p. 596). In this formulation, vulnerability is attributed to a lack of, or diminished resilience which is defined in terms of social capital, where resilience is the ability to call upon pre-existing social networks: 'the speed and effectiveness of the process of recovery to levels of trust and social capital – that is the resources available to individuals

through their social networks' (Aldrich, 2011, p. 598). Social capital is seen as playing an important role in disaster recovery and is 'defined as a function of trust, social norms, participation and network' (Nakagawa & Shaw, 2004, p. 5). Individuals and communities are seen to recover better, quicker and more effectively if they have 'good' social capital. In terms of the recovery process, 'the role of community leaders has been prominent in utilizing social capital in the recovery process, and facilitating collective-decision making' (Nakagawa & Shaw 2004, p. 5).

Social capital explanations of resilience and vulnerability are self-limiting. Summarised by Tzanakis (2013) and Haynes (2009), social capital is a contested concept and means different things to different social scientists. This is compounded by it being a misleading metaphor: social capital refers to networks and trust, whereas capital, originating in economics, draws on concepts of extension in time, an intended sacrifice for deferred benefit and alienability. Haynes notes that none of these properties are at work in notions of trust and relationships among people (Haynes, 2009, p. 4). Borrowed from economics, 'capital' is a concept that is not grounded in the social, and when used for social terrain it becomes a reductionist category that is an aspiration that tends to be used as an explanatory theory. According to Haynes, social capital is a tautology (using itself to explain its own existence). Social capital also is not always positive, though it is presumed to be in the literature – 'three key factors affording social capital – source of social control, source of family support, source of benefits through related networks – can each be reinterpreted as hindrances to effective decision making through imposing obligations, implying restrictions, or exclusion, and entailing unintended consequences and uncertainty' (Haynes, 2009, p. 14). Added to these limitations, social capital cannot be measured or examined directly. It can only be 'measured' by proxy. Aldrich's (2011) and Chamlee-Wright & Storr's (2011) studies use repopulation statistics and collective narratives, respectively.

While this approach offers an argument for explaining cohesion and lack of change in the long run, the problem is that social capital as a concept cannot explain emergent social innovation without recourse to pre-existing coping capacities, which remain a 'black-box', i.e. social capital as an already existing accepted fact that underpins subsequent theories about, for instance, social innovation or resilience (Latour, 1987, p. 4). In a social capital approach, resilience is in a complex inverse relationship to vulnerability. The core problem for using a social capital frame to interpret and analyse the Women's Voices narratives is that, while pre-existing networks of relations would have contributed to the women's social innovation, they do not fully explain the emergence of these social innovations beyond saying that they are examples of social capital in action. Furthermore, a social capital approach could only explain the lack of response to official coping support by referencing possible alternative social networks, but would not generate any insight into either the political dimensions of official responses, or what forms of coping these alternative networks may be generating.

Intersectionality is a primary analytic tool for theorising identity and oppression and has been widely used to generate gender-sensitive analysis of disasters and resilience (Enarson, 1998, 2012, 2014; Enarson & Morrow, 1998; Fordham, 1999; Fothergill, 1998; Yonder et al., 2009). Focussed on the intersection of hierarchical organising principles of society through lived experiences, it is 'the notion that subjectivity is constituted by mutually reinforcing vectors of race, gender, class, and sexuality, [and] has emerged as the primary theoretical tool designed to combat feminist hierarchy, hegemony, and exclusivity' (Nash, 2008, p. 2). As an analytical strategy, it subverts binaries in the service of theorising identity in a more complex fashion so as to enable the robust analysis of cultural sites that implicate sites of oppression and theorise the intersections of, for example, race and gender as social processes.

An intersectional approach frames resilience and vulnerability in a particular kind of relationship where vulnerabilities are regarded as pre-existing social conditions that make it hard to cope when particular needs unfold (where these needs emerge out of particular hazard events such as a flood, earthquakes, etc.). In this formulation, resilience and vulnerability are not in a mutually exclusive, binary relationship. Vulnerabilities are 'underlying conditions' that have particular compounding/cascading effects when they combine with disaster-induced needs (such as food, water and shelter) to shape particular experiences (Enarson, 2007, p. 259). Intersections of already existing social processes such as racism and patriarchy shape the experiences in situ. So vulnerabilities are increased risks in relation to hazards. While they are closely intertwined, vulnerability does not mean lack of resilience. They are discreet concepts that attest to intersecting social processes. When looked at closely, examples of an intersectional analysis of disaster situations suggest that, ultimately, resilience takes the form of social capital, i.e. they are approached as forms of social networks that can counter vulnerability. An example of this implicit social capital can be seen in the discussion of how two impoverished communities coped with a killer heatwave, where neighbourhoods with low community connections had high death rates compared with equally impoverished communities that had more 'sociability' (Enarson, 2007, p. 262).

Questions remain over whether an intersectional approach describes or explains women's oppression, and there are unresolved paradoxes, such as the fact that, while intersectional approaches identify particular intersections as 'symbiotic, cosynthetic, multidimensional, and interconnected, and that these all underpin the constitution of identity, it neglects to describe the ways in which privilege and oppression intersect and inform each other's experiences' (Nash, 2008, p. 11). An intersectional approach to resilience and vulnerability in relation to community leadership does draw attention to the constitution of identity in and through experiences of disaster. It would see a complex relation where resilience, or the capacity to cope, is impacted by intersecting underlying conditions (vulnerabilities), such as inequalities. While social vulnerability is not inevitably synonymous with lack of resilience, they are in a close, symbiotic relationship that does draw on aspects of social connectedness associated with social capital (Enarson, 2007, p. 263). Although useful for describing consequences and drawing attention to the constitution of identity through the experiential, an intersectional analysis approach fails to address emergent organisations without recourse to the notion of pre-existing social capital and all the black-box limits a social capital approach entails.

Despite their conceptual limitations, these approaches inform existing disaster management protocols in Aotearoa/New Zealand. From this perspective, preparing for disasters is about minimising the risks that are associated with the effects of disasters. For example, the risk of failed potable water supplies is minimised by strategies that ask people to store drinking water, basic hygiene requirements and food to last for a few days. These strategies are understood to bolster resilience. Mitigating risk is achieved by preparing for it; preparing for it involves taking a risk-averse approach to disaster management and can be seen in the '4 Rs' approach (reduction, readiness, response and recovery) of the Aotearoa/New Zealand CDEM integrated approach to disaster management (Ministry of Civil Defence & Emergency Management [CDEM], 2005a):

> Reduction: Identifying and analysing long-term risks to human life and property from hazards; taking steps to eliminate these risks if practicable, and, if not, reducing the magnitude of their impact and the likelihood of their occurring.
> Readiness: Developing operational systems and capabilities before a civil defence emergency happens; including self-help and response programmes for the general public, and specific programmes for emergency services, lifeline utilities and other agencies.

Response: Actions taken immediately before, during or directly after a civil defence emergency to save lives and protect property, and to help communities recover.
Recovery: The coordinated efforts and processes to bring about the immediate, medium-term and long-term holistic regeneration of a community following a civil defence emergency.

In terms of understanding vulnerability through a risk approach, those who are vulnerable are so because they are at higher risk of being adversely affected by the effects of the disaster. This way of approaching vulnerability implies a deficit understanding: to be vulnerable is problematic because it implies that high levels of risk bring with them an increasing likelihood of incapacitation, which must be managed accordingly, by reducing vulnerability through building resilience. Resilience and vulnerability then shake down into countervailing concepts that are connected together through complex social capital interchanges. Being resilient and responding to disasters involves diffusing the snowballing combination of existing vulnerabilities and new needs. This is done through the 'regeneration of a community' whose social connections have broken down or are at risk of breaking down. The Aotearoa/New Zealand *Template for group recovery report* list of 'Property visits, Community Meetings/public meetings, Community events/street parties, Council open days, Radio and print advertisements regarding assistance available, Information about school/education facilities closures/issues and rates relief (if relevant)' (CDEM, n.d.) reveals that community recovery is imagined and organised through group recovery managers appointed by Civil Defence who rely on a psycho-social model of resilience and recovery. Recovery and maintenance of resilience is closely tied to psychological models of narrative recuperation, where talking about a trauma is key to both fostering resilience to and recovering from trauma, as it is presumed that talking about trauma fosters reintegration of the thinking, feeling and acting parts of oneself that get split apart when under severe duress (Kuntz, Naswall, & Bockett, 2013). Since disasters are radical changes in context, needs escalate existing vulnerabilities and are likely to deplete resilience. The domination of clinical intervention in response strategies has been challenged over the last 20 years and is based, at the very least, on the ineffectiveness (Bourassa, 2009) of its 'individualised and mechanised models of stress and coping' (Cox, Long, Jones, & Handler, 2008, p. 470). The CDEM approach to coping and resilience assumes that those experiencing disasters are potentially disempowered because of the inevitable trauma of their experiences. The concept of resilience plays a central role in CDEM. This follows a global trend where, in the last decade, resilience has emerged as a guiding principle for urban development and disaster risk management. Aotearoa/New Zealand's prevailing disaster support and recovery strategy emphasises talking-based trauma counselling as a way to recuperate and rehabilitate traumatised individuals and groups, and the Canterbury population was designated as a traumatised group by dint of having earthquake experiences. This was evidenced in the government's response of sending out trauma-trained counsellors.

The question of how to address emergent networks in a way that is attuned to both the disjuncture between official and unofficial approaches to coping and the emergent character of coping can be effectively addressed by an ANT analytical approach. Growing in popularity in disaster studies (Easthope & Mort, 2014; Grove, 2013), 'the analytical project of ANT is to investigate how certain entities (called "actants") become related to other actants and how in certain cases, this process leads to the establishment of relatively durable and extended actor-networks' (Blok & Jensen, 2011, p. 167). A constructivist approach, ANT is a form of socio-technical analysis that focuses on the relations of all kinds of materials, actors, and things. Such 'assemblages refer to heterogeneous set of bodies, actions, desires, plans, statements, and laws that form 'provisional contingent wholes', apparent unities always on the verge of dissolution' (Grove, 2013, p. 571).

In terms of the sociological theorisation of disaster management, ANT's attention is on how recovery is shaped up through the production of actants and artefacts (Tironi, Rodriguez-Giralt, & Guggenheim, 2014). Accordingly, Brewer, Aiobheann & von Meding (2013, p. 81) argue that 'it may be beneficial to … use ANT to unravel the complex interplay between individuals and communities affected by disasters, and their governmental and non-governmental aid providers … to illuminate vulnerability reduction/community resilience failures' (and successes). As a bio-politics, a multiplicity of conflictual relations get shaped up through assembling technologies of recovery (Easthope & Mort, 2014).

Actants are constantly reforming networks, and by so doing, position themselves in different and changing roles. ANT argues that power, domination, and structure are processes resulting from actor-network relationships, rather than given systems attributes (Law, 1992). For the same reason, resilience is considered a process within an actor-network perspective (Dwiartama & Rosin, 2014, p. 3).

ANT pays attention to translation (problematisation, *interessement*, enrolment) to analyse the configuration of new networks, where 'the concept of translation refers to a process of organization and transformation of elements, by which actors try to overcome differences, misunderstandings, incoherence, and resistance' (Ponti, 2012). As this analytical perspective approaches resilience as a process and focuses on the relationships in which actants participate and how these are used to influence the shape of a network of related relationships, this means that ANT offers a way into examining the 'black box' of emergent social networks (Latour, 1987, p. 4). Guggenheim outlines three prominent ways that ANT scholars approach politics as producing disasters. First, through the way that states use a state of emergency to impose new bio-politics; second, through practices that shift focus to the risk of and protection from future disaster and are not so much studies of disasters as material events, but studies of how disasters produce effects before they even happen. The centre of analysis becomes 'the *imagination* of the disaster and the *consequences* various actors derive from these imaginations' (Guggenheim, 2014, p. 10). The third approach analyses politics as (producing) a disaster. 'While the first two approaches take politics as answering actual or eventual disasters, politics as disaster assumes that the disaster is an effect of political decisions' (Guggenheim, 2014, p. 10).

In this view, resilience and vulnerability are political terms that answer actual or eventual disasters as they are terms that attempt to produce effects – the consequences are that the construction of resilience and vulnerability are a mode of shaping up the world through the constellations of networks that these terms instigate. This would mean that resilience and vulnerability are emergent in and through the activation of struggle between different actor networks. In terms of the Canterbury earthquakes, the official response of sending counsellors was predicated on a particular way of imagining risk, and the elaboration of practices designed to enable particular kinds of inter-relations between actants that would bolster resilience in the face of existing vulnerabilities and compounding, hazard-induced needs. Official responses were an activation of a particular, pre-planned actor network that would spread to produce the desired effect of technologies of resilience as recovery (Easthope & Mort, 2014). The disjuncture between what was rolled out and local responses suggests the presence of alternative networks of coping and recovery. While these have already been identified by other researchers (Du Plessis, Sutherland, Gordon, & Gibson, in press), as attention has not yet been paid to how resilience and vulnerability are conceptualised and interrelated, this is the focus for the current analysis of these new alternative networks of coping.

The mobilisation of new translations was traced through the women's narratives. In terms of coping, the women's narratives do not follow the official psychosocial model of resilience that focuses on talking. Their coping is done through solace. Solace is most commonly associated

with adjustments and transitions of grief. Its 'defining characteristic is the sense of soothing. The word means to comfort, to alleviate sorrow or distress. It is that which brings pleasure, enjoyment, or delight in the face of hopelessness and despair' (Klass, 1992, p. 157). Solace is also a socially symbolic affair. When adjusting to change and loss, a person is

> confronted with loss and change at many different levels, and the world may become an unrecognisable place that has to be newly explored and adjusted to. The symbolic realm plays a significant role in these adjustments, because it is in this realm that already existing cultural prescribed meanings and symbols provide some sense of security in a time of flux. (McManus, 2013, p. 126)

This means that adjusting to loss involves exploring new worlds, and one's new place in a different world, and doing so in ways that both draw on existing meanings and symbols and formulate them anew. Solace is an apt term for the meaning-making the women articulated in their narratives.

Making sense of disaster: Hazard, risk, resilience and vulnerability

The women involved in the first tranche of interviews instigated socially innovative responses to perceived needs post-earthquake. Specific reference is made to the 'Farmy Army' (Farmy Army, 2011), the 'Christchurch Baking Army' (Christchurch Baking Army, 2011), the 'Student Volunteer Army' (University of Canterbury Student Volunteer Army, 2010) and 'Gap Filler' (Gap Filler, 2011). All of these networks emerged in the aftermath of the disaster. Each represents a specific and novel mobilisation of new networks between individuals, structures, objects and processes of coping in a post-disaster situation. Their activities echo Solnit's (2009) theme of ordinary people rising to the occasion in unexpected ways in extraordinary circumstances to respond to perceived needs and gaps in support and provision post-disaster. These women were responding to perceived gaps in the existing CDEM framework that drove the official reaction to the disaster (CDEM, 2005b, 2005c). As Winkworth, Healy, Woodward & Camilleri (2009) point out, the imperfect fit between official disaster planning and effective disaster response is a longstanding theme in the literature. Added to that, as Solnit and others point out, leadership and government response to disasters are seen to regularly fall short of meeting people's post-disaster needs and not uncommonly exacerbate negative consequences of disasters (Bullard & Wright, 2012; Sobel & Leeson, 2006; Solnit, 2009; Takeda & Helms, 2006).

When governments do evaluate their disaster leadership performances, they commonly acknowledge that while connecting to communities is a priority, there are multiple and complex challenges to achieving this (Eriksen & Gill, 2010). The lack of uptake of the Flying Squad is a case in point. One of the identified issues is that officials and communities seem unable to recognise themselves and each other in emergency planning and preparation models. For instance, plans for recovery work with specific models of community and community leaders in mind that do not always and consistently match existing communities and community leaders (Brogt, Grimshaw, & Baird, 2015; Phibbs, Kenney, & Solomon, 2015). The attempt to respond to this mismatch is evident in the shift in focus toward community engagement in Aotearoa/New Zealand's CDEM framework (CDEM, 2005b, 2005c, 2015a, 2015b). At the same time as governments and agencies struggle to effectively connect with their communities in disaster preparedness and post-disaster response, many of those who have instigated community initiatives are not recognised as community leaders because their social innovations are emergent and fall outside of the existing Civil Defence imaginary (Maidment, Tudor, Campbell, & Whittacker, 2015).

The interconnected concepts of hazard, risk, resilience and vulnerability underpin any definition of coping. This means that they are the key to understanding both the women's accounts of how they coped and the missed connections between their own and official coping strategies. The configurations of resilience and vulnerability in social capital and intersectional approaches underpin the CDEM and frame resilience and vulnerability in more or less complex countervailing relationships, while ANT poses them as productive, emergent nodes and competing actor networks through which new technologies emerge in situ. ANT understands resilience and its relationship to vulnerability as emergent.

The narratives

While the domination of clinical intervention in response strategies has been challenged over the last 20 years (based, at the very least, on the ineffectiveness [Bourassa, 2009] of its 'individualised and mechanised models of stress and coping' [Cox et al., 2008, p. 470]), the CDEM uses a model of recovery and maintenance of resilience that is based on psychological models of narrative recuperation, where talking about a trauma is key to both fostering resilience to and recovering from trauma. This is based on a 'deficit' understanding of grief and loss, where individuals are automatically assumed to be potentially in need of coping support to help them 'confront personal feelings, consequences of earlier insecure attachments, or a lack of healthy personal resources' (Hooyman & Kramer, 2008, p. 65). From this perspective, talking about trauma fosters reintegration of the thinking, feeling and acting parts of oneself that get split apart when under severe duress (Kuntz et al., 2013). This approach is seen in the immediate response to send in counsellors to help people cope by offering them opportunities to talk out their troubles in a professionally supported context.

When the women reflected on how they coped, it was not through sharing experiences of their suffering. These women found such pathways to coping inappropriate. The first extract explains that talking about it really was not a useful option given their circumstances. The way Jacqui[5] discusses the lack of talking may give some insight into why the vast majority of Christchurch residents did not avail themselves of the Flying Squad support. This form of support did not square with how they understood their experiences in relation to other people's capacity to appreciate and engage with them. Those who could understand were sick of it, those who wanted to help (e.g. visiting psychologists) were seen to not have the depth of experience necessary to be able to connect at any meaningful level of sharing an understanding of, or being able to realistically alleviate, the on-going experiences. In short, the kind of coping help offered could not resolve the inconsistencies between their need for support and the availability of support. Using ANT terminology, they could not become enrolled in the psych-social model of coping mobilised through the official support networks:

> It's really hard to explain to people who don't live in Christchurch … I have these little stock answers that I give to people … you know, "it's been rough but we're getting on with it". It's bloody miserable actually. It's very hard to describe to people what it's like living in this warzone. That's what it feels like, a warzone"… "Unless you're living here, it's very hard to describe what it's like. And my friends who don't live in Christchurch, they don't want to know … And you can't discuss it with people in Christchurch, because they're sick of talking about it (Jacqui).

A solace translation resolves the inconsistencies between present and past identities more effectively than dominant assemblages of finding coherence through talking do.

While talking about it wasn't the avenue to coping for these women, they still did achieve a sense of coping. When the women reflected on how they did cope, their narratives were underpinned by a shared pattern of experiencing a turning point in their reactions and responses

to the event that marked a shift toward comfort and a sense of hope in the future in the face of despair. Through recognising themselves as vulnerable, these women became able to respond to their situations with newly articulated senses of self that propelled their response strategies, which are the points of departure for the emergent recovery networks they instigated. In the following extract, Alex recounts being in the central city at 12.51 p.m., February 22, 2011:

> And then we got in the car, drove round the corner, and the earthquake hit. We were in the car, in the central lane; there was the turning lane here, and the other lane here going the other way. And buildings on both sides of the road just collapsed and cars in this lane were completely totalled. There was a van behind us, which was instantly crushed by this massive concrete beam, and it had people in it. We had bricks and dust and stuff all over us. My sister turned off the car, and we called out, and we tried to help the people in the van behind us. Three of them got out safely, and one of them unfortunately died … It was just chaos.

Alex's narrative moves to reflections on getting through the first few weeks. In it, she emphasises crises in who she was as a person, how she saw herself and what she did. These crises, following the logic of transformative learning, articulate a deep shift in the basic premises of thought, feelings and actions:

> I spent a couple of weeks just baking, everyone felt that we just wanted to do something to help … I've never been into baking much but I think, 'cause suddenly you're stuck at home, I had no employment, our social life had been confined to just being at friends' houses and stuff, so I really got into cooking … I guess I went into autopilot, and I was like I have to do something to help, I'm unemployed, what can I do … I threw myself into that.

Embedded in Alex's narrative is an acknowledgement of her sense of personal vulnerability: the obvious life-threatening danger she had been in, but also the significant loss of aspects of her identity as a self-employed fashion designer and contract designer for two existing city companies. The fashion line that she and her sister had been working on was at a 'dead end':

> I was stuck in the city … and the people working on the project had moved overseas. … Looking at the whole situation, I thought I can either let this be a negative or I can use it as an opportunity. And I thought, what are my skills, what is my training and how can I use that to move forward?'

At the same time, her narrative shows a review of her existing and new options, as old networks of employment and skill (fashion designer) are now non-existent and are replaced. Already existent skills (cooking) get elevated and serve as a nodal point through which she connected with other people. A new synthesis of connections through making a Facebook event page and a website – 'If you're in Christchurch and can't help with the Volunteer Army, why not do some baking? Or hold a bake sale for the good people of Christchurch in your own cities'. She 'knew' that physical labour wasn't suited for her, but baking was her forte. Her plan was simple – 'why not invite some of her friends over and start baking for the Welfare Centres and Volunteers all over Christchurch? Gather whatever that is left in their pantries and bake something simple yet nourishing for the volunteers and people that were displaced'. Alex instigated the Christchurch Baking Army (Christchurch Baking Army, 2011).

We gain insight from Alex that expressing what she was feeling was not part of how she experienced herself coping. Instead of talking about her trauma, she translated the disarray and disturbance, the *problematisation*, through a rearticulation of what she knew about herself. Acknowledging her already existing self-identity narrative ('what are my skills, what is my training and how can I use that to move forward?'), she drew upon her skills and knowledge base rather than an up-welling of emotions (one presumes, of fear, feeling overwhelmed, upset-ness, loss) to make sense of her coping strategy. She used her multiple vulnerabilities and put them to service as a vehicle for self-reflection and self-examination of her own existing resources and vulnerabilities and how they could come into play in a very different context for new ends in the form of the Christchurch Baking Army. Her Facebook page and call out

articulates the problematisation necessary for the emergence of a new actor network – the problem being her lack of 'silt-shifting skills' and the direct need to feed the volunteers and displaced. *Interessement* (acceptance of the view of the problem) as a matter of using existing baking and cooking skills in people with time on their hands quickly became *enrolments* through the new Facebook connected network of bakers, distributors, hungry volunteers and displaced residents. The non-human actors of physical and processual tools (like laptops, mixers, vehicles and ovens), strategies and materials (like recipes, flour, sugar, eggs and fridges) stitched together with human actors to become emergent coping networks.

As CDEM's psychosocial model of coping failed to effectively mobilise the Canterbury population into the trauma-based coping assemblage, alternative assemblages began to materialise. Instead of personal reintegration through narrating trauma, solace and social innovation became the new obligatory passage points that would resolve the problem of coping post-disaster. Helen interprets her experiences as not only her source of help but also the wellspring for her capacity to help others. On the afternoon of February 22, as media reports unfolded, Helen's attention was focused on the Pine Gould Corporation (PGC) building. It housed their accounting firm. 'I knew the PGC building was in trouble and our accountants were in there – they are Ashburton-based – and our accountant from Ashburton comes up one day a week, on a Tuesday, and it was that day, and he was killed'. That night, reunited with Peter (her husband) back at the farm at Swannanoa, Helen started cooking. 'I think I made big bacon and egg pies and fruit cake and goodness knows what and I took the first batch of baking to the Rangiora Welfare Centre'. At first, Helen had wanted to go in to the city to help, too. However, she realised that although she was highly competent, her family and farm were her priority. She also knew she stood little chance of being allowed into the disaster zone:

> As a 60-year-old woman, you've got to weigh things up. You know jolly well the guys will look at you and say "what the heck can she do, anyway?" and where your uses are better (served). Are you better getting some food ready?

Helen went on to set up the catering co-ordination for the Farmy Army that brought supplies and cooked food to people for months after:

> Years of living in the high country had weathered me for a rugged existence and I was able to cope with working day after day at full stretch. My husband and daughter were also involved in the Farmy Army's emergency effort … the long days left me very tired, but not stressed, and I tried not to take the worries to bed.

What this extract highlights in relation to building new networks is that it shows how Helen was resolving inconsistencies between needs (for food to be distributed) and availability (she could organise to source and distribute the food, and be a new organising node between local food-producing networks and new networks of people unable to feed themselves because of, for instance, lack of power, water, transport or money). In that process of resolving gaps, Helen was socially innovating. As she was effectively mobilising and materialising the Farmy Army, she was crystallising an alternative technology of coping in a post-disaster situation.

While the next extract from Coralie tells of how she saw herself as vulnerable and overwhelmed, it also suggests that these feelings did not propel her towards a state of disempowered victimhood. Instead, they were the source of her innovative response to the situation she found herself in. Coralie talked about how she was in shock after the February earthquake hit, knowing how close she had come to dying and how in an instant everything had changed. 'One moment I would be crying, the next moment I would be fine'. Coralie mentioned that when she went to Wellington, 'it was good to get away', but strange to be away from Christchurch. 'When I saw *I love Christchurch* posters I burst into tears.' And when she sat in Cuba St Mall (a shopping area in downtown Wellington), unable to make decisions, she

felt like she was invisible. She said that the whole time she was aware of the architecture, and 'all these beautiful old buildings that we don't have anymore'. They came home the following Wednesday or Thursday. They came home because she 'felt like I had to go home and help'. Coralie says that it took her two weeks to 'snap out of it' and start work on the Gap Filler project with two friends:

> Vacant spaces, vacant buildings are a reality of any city, it's just part of the life cycle, so I would like … would love to see that become something, that becomes what we do in Christchurch; when there is a vacant space we let someone else use it until it gets developed or rented again, we don't waste space, cause kiwis … don't chuck stuff out, you don't waste it, you reuse it. That's why people have so much junk around their houses; one day I might use that. I think we are not a wasteful people, so I feel like this is an extension of that national psyche.

Coralie's extract emphasises the emergent properties networks, literally filling material gaps in the city as a means to offer a model of coping.

Social innovation translation resolves the inconsistencies between need (what is required) and availability (who organises to source and provide the needed things – be they food, silt digging or filling gaps) from government-provided Civil Defence networks to new social networks such as the Farmy Army, the Baking Army and the Student Army. As new connections are forming, actants are constituted anew. Genevieve feels a new confidence in her own abilities. She has learnt that 'Nothing is impossible and that anything is possible'. Prior to the quakes she said, 'I struggled with my own self esteem'. Even when others praised her she 'never really believed it':

> [But the quakes] have taught me to reflect on actually who am I trying to prove to and why am I trying to prove it? … The only person that I need to prove to is myself, and if I can't do that then I'm not going to be able to be the person that I can be for my husband and my children and the work I do here. So I guess it's taught me to be a strong woman leader.

This confidence has positive outcomes in both her family and her workplace. With her children, she is working on 'having a really close relationship with them; trying to understand them and see what's important to them, and trying to shape up their personalities'. Whereas she was previously 'a control freak', this year she has 'stepped back and realized, no, these guys need to learn it. As quite often as parents we take over'. At work, Genevieve has focused on supporting her staff. Recently, her staff acknowledged her leadership and the way that accommodates them as working mothers. As a working mother in her earlier career, Genevieve 'didn't feel very supported around being a mother and being able to leave [work]', so she enjoys being able to offer her staff flexibility and understanding. She reflects, 'We will be more effective to our Pacific communities if we're in a position that we feel happy with who we are'.

In this reflection, Genevieve talks of bringing changes into her life and others around her, changes that have been recognised and rewarded as empowering. Her self-perceived strength as a woman leader came from acknowledging her vulnerability in her lack of self-esteem and inability to control when she could leave work. Genevieve's reformulation of how she understands herself as a person can be read as an emergent outcome of the ways in which different actants came together and were able to effectively 'translate' – the problem, for Genevieve, was how she saw herself; she was able to rework that through pulling together different aspects in novel ways, to become a 'node' in an actor network focussed on enabling herself and other staff to do things differently – such as leave work to attend to family or Earthquake Commission (EQC) matters. Genevieve achieves solace adjusting to her losses and in the process instigates novel approaches and networks of support.

Each narrative shows that the process of translation frames solace and social innovation as a new successful 'passage point' that resolves the problem of coping. How these women

understood their journey to coping, how they came to socially innovate, and how they understood the reformulation of themselves (and of which the social innovation is an outcome) sheds insight into the meaning-making for these individual women – it directly stems from their vulnerabilities. The relationship between resilience and vulnerability that these women were activating can be seen as a co-constituting one. It is through struggling with inability and incapacitation in previously existing actor networks that new ones are formed and new nodes emerge through novel syntheses of human and non-human technologies.

When the narratives are synthesised, a broader, collective narrative of women coping emerges, one where resilience plays a co-constitutive role in relation to vulnerability. Each node – the Farmy Army, the Student Volunteer Army, the Bakers Army, Gap Filler – shows in different ways the process of translation that frame solace and social innovation as new passage points resolving the broad problem of coping. The emphasis is on embracing their risky contexts and using them as springboards as they recognised their own risk (Alex), assessed it (Helen), responded to it (Coralie) and demonstrated new selves (Genevieve). Each woman experienced risky environments and each took risks with their lives, physically, emotionally, and professionally. They took the chance to bring their own talents to bear on pressing community needs such as distributing food, supporting management through crisis, regenerating urban spaces, and empowering mothers in the workforce. In summary, how they handled their vulnerability and risk was to transform their sense of helplessness (Helen), invisibility (Coralie), loss of control (Alex), and lack of self-esteem (Genevieve) with a newly crystallised technology of coping. While articulations of gendered social roles still inform these women's experiences, engaging with, rather than avoiding, risks and vulnerabilities lies at the centre of their sense and networks of coping and resilience. They produce resilience through finding solace and solace through social innovation.

Coping as resilience, resilience as solace, solace as social innovation

The Women's Voices narratives focus on one specific dimension of experience, as opposed to life-story narratives, and so what can be inferred from them is limited. However, as women relate how they understand their disaster experiences in terms of how they see themselves, the particular meanings made of these experiences become available for analysis (Cox et al., 2008). It also becomes possible to offer new testimonies to bring 'new voices and previously untold stories into conversations on topics about which these voices provide invaluable witness, critique and alternative narratives' (Maynes, Pierce, & Laslett, 2008, p. 7). These narratives, centred on marginalised voices, can be used as 'sources of counter narratives to undermine misleading generalisations, correct commonly misused analytical categories, or refute historical claims based on other types of evidence or other modes of inquiry' (Maynes et al., 2008, p. 8).

Analysing narratives of coping reveal that the women coped by engaging with risk and vulnerability, rather than avoiding it. Also, their modes of engaging with risk and vulnerability were not to focus on talking of the trauma. Rather, their acknowledgement, assessment, response and decision-making about their vulnerabilities were the wellspring of their coping with the loss of their identities, possessions and livelihoods and their contribution to on-going recovery in the city and region.

Each narrative demonstrates two dynamics at work – an arc of personal transformation and an arc of merging of individual experience and collective activity that culminate in an

acknowledged sense of hope in the future that comes directly through their frightening experiences and subsequent reflection on their losses. In other words, these women found social innovation as a source of solace, and solace as a source of resilience.

Following the four dimensions required to make this translation happen, the gap between government roll-out of counsellors and local uptake speaks to a disjuncture between, or failure of, a fully effective translation to shape up new relations between a number of actors. It could be argued that what happened was the elaboration of new, emergent, unexpected response and resilience networks in those sites of need. Adopting an ANT approach to examining the women's transcripts meant paying attention to the components of translation present in their accounts as evidence of crystallising constellations of coping. The narratives were a means to gain insight into how resilience and vulnerability interrelate in and through these network-building nodes of emergent socially innovative initiatives.

In terms of this paper, ANT was used to approach the dissonance between formal and informal responses to coping support as evidence of the existence of multiple assemblages of coping in post-disaster contexts. When faced with gaps in support, residents had to rethink, renegotiate and recalibrate their coping relations and associated objects, structures and processes. What transpired in the Canterbury context is that the dominant assembly framed through a psychosocial model of coping, itself based on an intersectionally inflected social capital approach to resilience and vulnerability, was articulated through the objects, structures and processes of the CDEM model. These women's narratives revealed the emergence of alternative assemblages of coping. These alternative networks begin to materialise in the break from the models of coping embedded in the CDEM network – these official networks failed to enrol the Canterbury population into their network of coping. The network's articulation of coping is based on regaining personal and social stability and reintegration through a psycho-social model of resilience, and it is evident in the government's response of sending out trauma-trained counsellors. As such, the Flying Squad, alongside the CDEM processes and protocols, were actants that brought together a particular 'construction of technologies and truths' about coping post-disaster (Star, 1991, p. 28). However, the multiplicity of networks of coping became evident as Canterbury residents turned away from these dominant networks and proceeded to engage in alternative ways of coping. Solace and social innovation were the new alternative translations that reconciled the contraries and inconsistencies freshly revealed by the new needs generated in the earthquake.

Conclusion

The Christchurch earthquakes were the world's third most costly event of 2011, with total costs of up to $NZ30 billion (Lambert, 2013; Munich, 2012). While women have done much of the day-to-day work in families, neighbourhoods and communities, in the rush to save, restore, demolish, rebuild and run Christchurch in a context of prevailing gender hierarchies, women's stories of coping have arguably faded into the background. This paper combined insights from gender-sensitive ANT to examine 32 earthquake accounts drawn from the Women's Voices archive.

The narratives of coping offered an alternative formulation of resilience and vulnerability to official constructions that inform mainstream articulations of resilience and the model of coping that underpins Aotearoa/New Zealand's national disaster and recovery strategy. The analysis offers insight into coping as emergent networks of solace and social innovation, predicated on co-constituting relationships between resilience and vulnerabilities. It is hoped that this

insight can feed new knowledge into living through disasters resiliently and therefore what can constitute useful pre-emptive approaches and in-the-fray disaster support. Women talking with women about how they coped and what they did and what they think about what they did reveals a profound personal understanding of the connections between individual and personal narratives and broader social narratives as both sources of and vessels for transformative lives not neatly captured in the prevailing assemblage of resilience.

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