# The limits of resilience: A discussion of resilience from the perspectives of critical disaster studies

*Shinya Uekusa*[1, 2],
*Steve Matthewman*[3]

[1] Department of Sociology and Anthropology, University of Canterbury, New Zealand.

[2] School of Psychology, Massey University, New Zealand.

[3] Department of Sociology, University of Auckland, New Zealand.



**Author correspondence:**
Shinya Uekusa
Department of Sociology and Anthropology,
University of Canterbury,
Christchurch,
New Zealand.
Email: shinya.uekusa@gmail.com

URL: http://trauma.massey.ac.nz/issues/2022-3/AJDTS_26_3_Uekusa.pdf

## Abstract

*Mechanistic and scientific approaches to resilience assume that there is a "tipping point" at which a system can no longer absorb adversity; after this point, it is liable to collapse. Some of these perspectives, particularly those stemming from ecology and psychology, recognise that individuals and communities cannot be perpetually resilient without limits. While the resilience paradigm has been imported into the social sciences, the limits to resilience have often been disregarded. This leads to an overestimation of "human resourcefulness" within the resilience paradigm. In policy discourse, practice, and research, resilience seems to be treated as a "limitless" and human quality in which individuals and communities can effectively cope with any hazard at any time, for as long as they want and with any people. We critique these assumptions with reference to the recovery case in Ōtautahi Christchurch, Aotearoa New Zealand following the 2010-11 Canterbury earthquake sequence. We discuss the limits to resilience and reconceptualise resilience thinking for disaster risk reduction and sustainable recovery and development.*

**Keywords:** *Canterbury earthquake sequence, critical disaster studies, disaster risk reduction, disaster theory, limits of resilience, resilience, social capital, sustainable recovery*

Mechanistic, scientific, and interdisciplinary approaches to resilience have not only enriched resilience thinking in disaster research but also clouded its conceptualisation (Alexander, 2013). When resilience thinking was adapted to social sciences from various disciplines such as ecology, engineering, and psychology, the notion of the "limits of resilience" was somewhat disregarded. In some of these perspectives, particularly those stemming from ecology and psychology, there is a "tipping point" at which systems can no longer bend and absorb adversity and may collapse. As Manyena (2006) describes, in the current resilience paradigm in disaster research, "resilience is arguably about people's capacity far beyond the minimum of being able to cope" (p.438). Particularly drawing upon ecological and psychological perspectives, individuals and communities cannot be perpetually resilient to disasters – which may be triggered by natural or human-induced hazards – without limits. While tipping points may be contextual and variable, they typically manifest post-disaster as civic withdrawal, increased community distrust, decline in social activities, out-migration, fatigue, depressive symptoms, trauma, mental health issues, substance abuse, domestic violence, suicides, lonely deaths, and other psychological and social issues (e.g., Bonanno et al., 2010). This is particularly evident in residents of Ōtautahi Christchurch (Ōtautahi hereafter) in Aotearoa New Zealand who have gone through multiple disasters, including: major earthquakes (2010, 2011, and 2016), major floods (2014, 2017, and 2021), the 2017 Port Hills wildfire, the 2019 terrorist attack and, as with the rest of the world, the current COVID-19 pandemic. While physical infrastructure and the built environment can be rebuilt more sustainably, the current resilience approach does not seem to help people and communities recover from disasters as sustainably as intended.

In policy discourse, practice, and disaster research, resilience seems to be treated as a "limitless" human quality. It is unrealistically conceptualised as a convenient buzzword in disaster risk reduction (DRR), adaptation to climate change, and sustainable development strategies that individuals and communities can be resilient at any time, for as much and as long as they want and with any people. This popular concept has been heavily criticised for various reasons including the lack of clarity (Alexander, 2013; Manyena, 2006; Tierney, 2014), the

incommensurability of resilience (Chandler & Reid, 2016; Olsson et al., 2015), the tendency to disregard the issue of social vulnerability to disasters (O'Brien et al., 2006; Uekusa, 2018), and the neoliberalisation of resilience (Chandler & Reid, 2016). However, even these critiques have not properly addressed the issue of the limits of resilience, excepting a few social scientists who included "resilience thresholds" in their frameworks (e.g., Folke et al., 2011; Payne et al., 2019; Resilience Alliance, 2007; Wilson, 2012). Nonetheless, their works are not theoretically and empirically informed. Thus, it is critical to ask a further conceptual question: is it realistic and practical to theorise resilience as a "limitless" human and community quality? If so, how much and how long in reality do individuals need to be resilient and "endure", and how many layers of resilience do communities have to develop if community resilience refers to both built environment and people? We all need to remember that people in the first place aspire to be outside the disaster-prone areas, instead of being stuck and given the label of being "resilient" (Manyena, 2006). How then should this notion be included in a more realistic and practical conceptualisation of community resilience?

Referring to the case of Ōtautahi recovery in Aotearoa New Zealand, resilience theories need to carefully consider the fact that, while the city is physically recovering from the 2010-2011 Canterbury earthquake sequence (details of the sequence and subsequent damage are available elsewhere, e.g., Potter et al., 2015), residents have experienced and need to deal with the *wave* of (sometimes related) adversities. These include the disasters mentioned above, pre-disaster social problems, limited economic growth, working-age population exodus, mental health crises (i.e., heightened depression, substance abuse, and domestic violence), river and groundwater pollution, and sea-level rise. Following the 2010-2011 major urban disaster, people in Ōtautahi have generally shown remarkable resilience and exemplary social recovery as described in many research studies and international media reports (see for example Crowley & Elliott, 2012); however, such resilience is not pre-planned, engineered, politically enhanced, or limitless. Some of Ōtautahi's residents, particularly those who are more socially vulnerable and have taken longer to get back on their feet (such as the poor, the elderly, migrants, and refugees), have appeared to be "resilient" simply because they had no other options than withstanding the series of disasters and on-going social issues. Without healthy and sustainable recovery of all affected people, the very idea of community and built environment resilience may be an unattainable blueprint.

While experiencing varying degrees and speed of recovery and resilience, residents in the affected areas in Ōtautahi do not cease to cope with challenges. Thus, unlike built environment resilience, human resilience can be understood as a normative function of human adaptation to cultural, economic, environmental, ideological, political, and social changes and challenges (Masten, 2001) even though how well people adapt to such changes and challenges depends on the resources they possess and/or are able to access (Uekusa, 2018; Ungar, 2011). Have those in Ōtautahi, for instance, had any opportunities to stop (or take a "break" from) being resilient? Considering varying personal circumstances, some people in a disaster-affected community need to endure or be resilient more than others or for a more prolonged period of time, which again reflects the amount and types of resources they possess and to which they have access (Uekusa, 2018). It is unsurprising that some disaster survivors, especially the socially isolated and vulnerable such as older adults, experience heightened economic, mental health, political, and social challenges, often resulting in severe psychological distress and, in the worst cases, suicides and lonely deaths (Allen et al., 2018; Bonanno et al., 2010; Kunii et al., 2016; Orui et al., 2018; Yasumura, 2019). Drawing upon previous empirical research, this paper will explore the limits of resilience and call for further theoretical and empirical discussions. It is hoped that the notion of the limits of resilience will help researchers, practitioners, and policymakers reconceptualise the already troubled resilience thinking for more effective DRR and sustainable recovery and development.

### *The Notion of the Limits of Community Resilience vs. Individual Resilience*

The major criticism of the resilience approach includes: 1) the lack of conceptual clarity and measurement (e.g., what kind of resilience for whom?; Alexander, 2013; Tierney, 2014); 2) the mystification of social agency and human resourcefulness, which disregards the resource-dependent, multidimensional, and contextual nature of resilience (MacKinnon & Derickson, 2013; Robinson & Carson, 2016; Uekusa, 2018); and 3) the tendency that, in combination with a heavy emphasis on social capital, the concept has been used, deliberately or unintentionally, in a way that leads to the neoliberalisation and individualisation of resilience, causing the *responsibilisation* (where someone or

a group is made responsible for a task rather than another, typically an agency or state) of individuals and communities and the reproduction of social inequality (Chandler & Reid, 2016; Vilcan, 2017). These critiques have already provided sufficient reasons for researchers to reconceptualise resilience and its premises (please also refer to Alexander, 2013; Beccari, 2016; Manyena, 2006; Tierney, 2014 for further definitional discussions, criticisms, and existing indices and measurements). However, this reconceptualisation has not yet been realised. As such, the concept has been continually used as a convenient buzzword and translated into unrealistic and less costly political agendas and solutions, which largely depend on communities and their own resources to reduce social vulnerability, develop resilience capacity, and increase sustainability.

Despite the clouded conceptualisations, the multidimensional nature of resilience – described as a set of adaptational capacities – has lately been well conceptualised (e.g., Obrist et al., 2010). Such a composite and multi-layered approach is pragmatic to conduct a holistic assessment of community resilience, which is "the collective ability of a neighbourhood or geographically defined area to deal with stressors and efficiently resume the rhythms of daily life through cooperation following shocks" (Aldrich & Meyer, 2015, p.255). In community contexts, different resilience variables in different dimensions (e.g., built-environment, cultural, economic, environmental, institutional, and social) may compensate for each other (Masterson et al., 2014; Wilson, 2012). A clear example of this is that social capital tends to compensate for the lack of economic, cultural, environmental, institutional, and other forms of resources/resilience, and more durable social capital generally increases community resilience to disasters (Aldrich, 2012; Klinenberg, 2002).

However, aggregating resilience indicators at different dimensions with equal weighting to measure community resilience can be problematic (Tierney, 2014). This is mainly because, in certain contexts, missing just one particular quality such as trust or social capital (as in social dimension of resilience) can cause greater post-traumatic stress disorder (PTSD) and depressive symptoms among disaster survivors (Adeola & Picou, 2014; Bonanno et al., 2010) and a community to lose solidarity and collapse. These mental health issues are typically seen in the wake of contagious diseases such as Ebola and COVID-19 (Rao & Greve, 2018) or technological disasters (Gill & Picou, 1998; Picou et al., 2004). Technological disasters or natural hazard-triggering technological (natech) disasters "occur when breakdowns in technological and bureaucratic organization systems lead to destruction or contamination of the natural and built environment" (Gill & Picou, 1998, p.796). This type of disaster is often more psychologically stressful and the impact on community is more detrimental for various reasons (Picou et al., 2004). Kokorsch and Benediktsson's (2018) study showed that the disappearance of natural resources (i.e., environmental resilience) and decline of the fishery-based local economy (economic resilience) in a fishing village in Iceland triggered the out-migration of residents and declining economic and social services. This led to the dissipation of the fishing community itself and losing community resilience to the gradual environmental changes. Therefore, Payne et al.'s (2019) approach is crucial because their framework integrates the assumption that "communities must have a minimum level of resilience in each dimension to be resilient overall" (p.153). This is important when each dimension of resilience is conceptualised and assessed holistically instead of individually. Lack of resilience in one dimension such as individual-level psychological or natural/economic resilience can undermine resilience and adaptation capacity at other dimensions or community resilience overall (Alexander, 2013; Payne et al., 2019). Thus, multidimensional approaches should not overlook this point because the notion of the limits of resilience thus far does not seem to be properly integrated.

In many of these multidimensional frameworks of community resilience, the wellbeing of individuals in particular is not considered as a critical component. Beccari's (2016) comprehensive review of the existing resilience composite indicators demonstrates the lack of variables measuring the wellbeing of individuals and households; therefore, many existing composite indicators target communities but not households and individuals. It is reasonable to admit the challenge of developing a generalisable composite community resilience model which includes a measurement of individual- and household-level resilience as a contributing factor. Thus, there is a lack of linkage between individual-level resilience indicators (e.g., economic, physical, and mental wellbeing) and meso-/macro-level community resilience indicators with community being the smallest unit of analysis. What can be quite conceptually troubling here is that, despite varying definitions, a "community" is a collective of diverse individuals who are robustly, loosely, or spontaneously connected through shared interests, purposes, identities, and/or geographic proximities (Neal, 2012), which cause different degrees

and types of community members' social connectedness. Hence, community resilience in disasters can be highly affected by individual-level psychological resilience, demographic characteristics, personal circumstances, and other micro-level social factors (Lee et al., 2018; Masterson et al., 2014).

While demographic characteristics of community (e.g., age distribution, average income, racial composition, political affiliation, and religious views) are easier to quantify in a statistical model, it is nearly impossible to include psychological resilience and personal circumstances into a linear theoretical model to assess community resilience. However, Lyons et al. (2016) note that there is a strong relationship between individual resilience and collective resilience even though there is a lack of efforts to link psychological and sociological approaches. Hence, in addition to the standardised community resilience variables, the conceptualisation of community resilience would need to include the notion of the well-established link between community resilience and the mental health and wellbeing of residents (Adeola & Picou, 2014; Lee et al., 2018).

While there can be some community members who may experience job loss, other disruptions in daily life, severe stress, and limited resilience more than others, communities as collectives will most likely survive and recover from disasters. Individual-level struggles and endurance tend to be overlooked or even justified for collective good. If a relatively high proportion of community members severely struggle from heightened distress, fatigue, antagonism, and limited psychological resilience, logically the community may lose its function and its collective resilience. If a disaster, especially technological disaster or contagious disease such as COVID-19, causes excess environmental, economic, psychological, political, and social damages including community antagonism, community resilience is less likely, regardless of other dimensions of resilience (Lee et al., 2018; Picou et al., 2004; Rao & Greve, 2018). Indeed, in response to a disaster, some residents who are capable may simply out-migrate from their community; consequently, after a community reaches a tipping point in one dimension of resilience and starts losing its residents and functions, it can simply cease to exist (see Kokorsch & Benediktsson, 2018, for their case study of Icelandic coastal communities).

The dynamic nature of community itself needs to be better understood. While individual resilience remains high following the February 2011 Christchurch earthquake, functional communities have been lost due to "the forced and voluntary haemorrhaging of neighbours forced to leave as their houses have been demolished or zoned 'red'" (Wilson, 2013, p.209). Communities are dynamic and, even in non-disaster situations, community members move in and out for various reasons, depending on varying resource availability (Thiri, 2017). For example, refugee groups in Ōtautahi who were further traumatised by the Canterbury earthquake sequence (and later the 2019 Christchurch Mosque attacks) and left Ōtautahi for other cities in Aotearoa or Australia through their (transnational) ethnic networks (Emhail, 2019; Marlowe, 2015) because *they could not (or did not want to) take it anymore*. Out-migration from disaster affected communities has been quite normal as disasters are a significant "push" factor of migration (Adams-Hutcheson, 2015; Wilson, 2013). Ōtautahi initially lost 70,000 residents to other cities following the 2011 Christchurch earthquake due to uninhabitable housing, reduced economic and social services, and fear of aftershocks. When a substantial number of community residents leave (excepting the case of mass dislocation), there is little or no community left to try to increase collective resilience. If remaining residents are particularly socially vulnerable groups such as older people, it is logical that strong community resilience may not be expected.

Despite its importance, only a handful of the existing research on disaster resilience has addressed the conceptual issue of "resilience thresholds" (see, e.g., Folke et al., 2011; Resilience Alliance, 2007; Wilson, 2012). These studies, some implicitly, address that individuals and communities cannot be perpetually resilient without limits. A simple logic to suggest here is that there may be a point beyond which community resilience slows down or becomes no longer available (Olsson et al., 2015). Wilson (2012) explains that, in ecology, "resilience thresholds and tipping points linked to any form of disturbance will be associated with an inability of a community to recreate the original state before the traditional rupture, with the possible inability to implement a period of readjustment and recovery" (p.69). However, empirical evidence from social science research is insufficient to inform and add such a theoretical notion to the conceptualisation of community resilience. To emphasise the point, if we take psychological and ecological perspectives, it is evident that the community resilience curve should have the potential "break down". However, most resilience frameworks seem to assume that (existing and emergent) community groups can be resilient at any time, for as much and as long as

they want, and with any community members. To our knowledge, these theoretical notions are unfortunately not empirically informed by existing disaster research. Revisiting the engineering, ecological, and psychological approaches to resilience and their major features and premises can be critical in exploring and incorporating the notion of these limits into resilience thinking for more effective and practical use in future research and practice.

### *Engineering and Ecological Perspectives: The (Eco) Systems Cannot Bend, Absorb, or Transform Forever*

Along with many other disciplinary origins, resilience thinking stems from physics (Gordon, 1978) and ecology (Holling, 1973), so it is understandable that engineering and ecological approaches have had a prominent role in conceptualising disaster resilience. In engineering and physics, resilience simply refers to the "capacity of a material to absorb energy when it is deformed elastically and then, upon unloading to have the energy recovered" (Callister & Rethwisch, 2012, p.216; see also Gordon, 1978). For this school of thought, after crossing the tipping point, there is no "bounce back". The object simply collapses. However, as social scientists later adapted the resilience concept from ecology, there was a shift in the focus from "resistance to change" to "adaptation and transformative capacities" (Berkes, 2007; Norris et al., 2009). Therefore, in an ecological perspective, resilience thresholds differ from engineering ones as the tipping point is relative and dynamic instead of static and absolute. In ecology, resilience refers to "a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations and state variables" (Holling, 1973, p.14). In this sense, when the ecosystem approaches a tipping point, the system generally "transforms" but may not necessarily "die down".

Ecosystems are often capable of absorbing a variety of disruption (e.g., climate change, natural hazards, pollutions, and other anthropogenic disruptions) and transforming themselves to adapt (Holling, 1973; Groffman et al., 2006). The Ōtautahi residential red zone is the abandoned former residential area in Ōtautahi which, due to liquefaction and increased flood risk, is uninhabitable and community rebuild is deemed impossible. This area is nearly twice the size of New York's Central Park and over the last decade has been transforming back to a swamp; the ecosystem has moved on after 10,000 human residents left the area (see Mitchell et al., 2019 for more details on the transformation). There is a very basic assumption in this approach that, unlike community, the ecosystem does not usually die, it keeps transforming until it reaches the absolute limit at which the system cannot absorb the drivers (Holling, 1973, p.7). Thus, the idea of "bounce forward" or "sustainability", instead of "bounce back", stems from such an ecological idea that communities have adaptive and enduring capacities in response to the external shocks and stress and (sometimes related) internal changes (Payne et al., 2019). As the earth system is dynamic, some changes are always expected after the system reaches the resilience tipping point (Moore, 2018). However, when cumulative stressors pass ecological resilience limits, recovery can be limited and ecosystem services can be degraded (Thrush et al., 2009). In some contexts, an ecological threshold exists and can be described as "the point at which the ecosystem loses its capacity to recover, or at which its resilience and integrity are lost" (Thompson, 2011, p.27).

When ecological resilience was expanded to include infrastructure, communities, and individuals and adopted to social sciences, researchers, practitioners, and policymakers alike somewhat disregarded the linkage between the earth, built environment, and social systems in the conceptualisation of community resilience (Folke et al., 2010; Mayer, 2019). Healthy ecosystems and environmental capital are critical components of a community, especially in less urbanised regions where local economy relies on the extraction and exploitation of natural resources. This was described in Kokorsch and Benediktsson's (2018) research in the Icelandic fishing villages. Moreover, Wilson's (2012) example of submerged farming and fishing villages in the Pacific and Indian Ocean due to climate change and sea-level rise shows an extreme form of loss of community resilience after the surrounding ecosystem crosses the ecological tipping point. Collective relocation and resettlement supported by transnational governmental efforts are underway in these locations, so the displaced residents can still be viewed as remarkably resilient while their "community" might have lost their identity and major functions and will never return to its original state. Further to consider in this particular case, while the displaced are viewed as resilient, they probably did not want to be resilient if they had the option not to be.

In response to environmental disruptions induced by natural hazards (including climate change) or human activities, whether gradual or rapid, the surrounding ecosystem keeps ecologically transforming until it reaches the tipping point. Community resilience, however, may approach multiple tipping points when

resilience in different dimensions such as economic and ecological is no longer available. The physical community might disappear while individual-level resilience may remain high, or vice versa can be true. This demonstrates why a multidimensional approach is beneficial in the conceptualisation and assessment of community resilience. Community and individual resilience is embedded in the wider ecosystem, built environment, and socioeconomic system. It is problematic that individual-level psychological resilience is still excluded from such meso or macro multidimensional approaches, as ecological approaches do not necessarily take micro perspectives to focus on the individual (species) as a unit of analysis in an assessment of the wider ecosystem.

### *Psychological Perspectives: A Tipping Point at which Human Beings Cannot "Endure" Anymore*

Instead of putting exclusive analytical focus on individuals, our intention in this article is to take the critical perspectives, particularly using a sociological theory of "sociological imagination". This emphasises the convergence and puts more effort into synthesising macro, meso, and micro perspectives to increase our ability to look beyond individuals' personal circumstances to larger social forces (Mills, 1959). In disaster research, it is critical to recognise that larger social forces, including disasters themselves, have impacts on the wellbeing of individuals which affects the way communities experience, respond to, and cope with disasters. Indeed, there is clear merit in integrating the notion of the limits of psychological resilience into a radical reinterpretation and further problematisation of resilience thinking.

Like the ecological approach, adaptation is the main focus in (child) psychology. As Frerks et al. (2011) note, resilience in development psychology refers to an individual's adaptive capacity to respond to stress. Psychological resilience is defined as "the process of effectively negotiating, adapting to, or managing significant sources of stress or trauma" (Windle, 2011, p.163) or "the ability to maintain mental health equilibrium in the presence of external shocks" (Zahran et al., 2011, p.1108). Examples of this approach and empirical evidence in psychological research are plentiful and useful for disaster researchers to consider the alternative or more nuanced conceptualisation of resilience for future research. This approach assumes that resilience is not a limitless human quality because adaptation to stress and external shocks depends on cognitive, situational, and sociocultural factors (Fletcher & Sarkar, 2013); thus, tipping points are dynamic, relative, and contextual.

Bonanno et al. (2010) stress that disasters unfortunately cause large-scale loss of life and livelihoods, so disaster researchers need to understand that "the death of a close friend or relation results in intense sadness, dysphoria, and intrusive preoccupation with the lost loved one as well as transient cognitive disorganization, health problems, and impaired role functioning" (p.6). Although Bonanno et al. (2010) argue that there is no significant increase in suicides following major disasters, it is undeniable that, in long-term recovery, suicidal ideation and substance abuse may increase. For example, Yasumura (2019) found that following the 2011 Great East Japan earthquake and tsunami ("Tohoku disaster" hereafter) the suicide rate decreased during the "honeymoon" disaster phase. The "honeymoon" disaster phase typically lasts a few weeks, during which "[m]edia attention, free medical aid, free food and shelter, VIP visits to the camp, administrations' sympathy, compensation package, rehabilitation promises provides immense sense of relief and faith in survivors that their community will be restored in no time and their loss will be accounted through monetary benefits" (Math et al., 2015, p.263). However, 3 years after the disaster (typically known as the "disillusionment" phase), the suicide rate eventually increased and exceeded the pre-disaster level.

Norris et al.'s (2009) psychopathological analysis of disaster victims based on longitudinal quantitative data shows the possible tendency of psychological resilience to sharply increase after disaster but start to decrease after a certain time. There were (small) groups of people who experienced "chronic dysfunction", implying that, while most people in the study coped well with the traumatic events, some experienced chronic PTSD and showed limited resilience (see also Kukihira et al., 2014). Kukihara et al. (2014) argue, based on their quantitative analysis, that the 2011 Tohoku disaster survivors endured the traumatic events relatively well but exhibited significant symptoms of depression and PTSD. Thus, through a psychological lens, both people's (short-term) remarkable resilience and (long-term) increased vulnerability are theoretically and empirically evident.

Despite the lack of empirical research, news media has reported that "chronic toxic stress" and other mental health issues (including related domestic violence, substance abuse, and suicides) increased in post-earthquake Ōtautahi (Beaglehole et al., 2019; Blundell, 2018; Hayward, 2013; Hayward, 2018; McClure, 2016; Rowney et al., 2014). While the mental health of the

Ōtautahi population was expected to recover after 5 years, as of 2016 "mental health problems [were] mounting in almost every measurable area" (McClure, 2016, para.1). Consequently, Blundell (2018) reported that mental health service professionals in Ōtautahi have been devastated due to the record-high demands. The city is physically "building back better" as a future, sustainable, and resilient city, while Ōtautahi's mental health crisis, which can be a manifestation of the limits of community resilience, has not been properly investigated. Indeed, it is unsurprising that, as Adams-Hutcheson (2015, p.136) and Wilson (2013, p.211) note, a series of major events in Ōtautahi dented residents' psychological resilience; consequently, approximately 70,000 residents decided to out-migrate from Ōtautahi to geologically more stable regions in Aotearoa New Zealand. Ōtautahi recovery and resilience following the 2010-2011 events has been portrayed as exemplary and remarkable by international media (Crowley & Elliott, 2012), yet, probably due to the delayed recovery and waves of disasters, potential effects of the recent mental health crisis on community resilience have been understudied. Although disaster-related severe stress may not directly cause the loss of community resilience, it clearly provides an important point to consider. Indeed, previous research findings revealed that, following Hurricane Katrina and the Deepwater Horizon oil spill in the Gulf Coast, higher rates of depression and anxiety were significantly associated with lower community resilience (Lee et al., 2019). Again, technological disasters and contagious diseases like Ebola and COVID-19 cause community distrust, civic withdrawal, increased stress, and mental health issues among community residents, thereby developing "corrosive communities" and weakening the bonds of social integration, instead of developing resilient communities (Picou et al., 2004; Rao & Greve, 2018).

What can be misleading is that, although some individuals in remarkably resilient communities in the wake of disasters may experience severe distress and other psychological issues, the *majority* of people do not give up coping with disaster-related and pre-existing difficulties and will keep adapting to the new normal. In fact, it could *increase* their resiliency; those who are exposed to adversities can "earn" strength, particularly psychological, to cope with future adversities (Masten et al., 1990). Although resilience is resource-dependent, the socially vulnerable – typically those with limited resources – can still develop strong resiliency by "earning strength" (McIntosh, 2007; Uekusa & Matthewman, 2017) as they deal and cope with various forms of social oppression ranging from poverty, racism, and violence to lack of resources on a daily basis – so-called "everyday disasters" (Matthewman, 2015).

Uekusa and Matthewman (2017) provide not only a theoretical argument but also an empirical example that (im)migrants and refugees, who had been exposed to previous disasters and earned strength, demonstrated somewhat unsurprising resilience to the Ōtautahi and Tohoku disasters. The oppressed, such as the poor and racial minorities, earn strength by going through everyday difficulties and social inequalities (McIntosh, 2007). A critical implication here is that the socially vulnerable may develop higher reference points – psychological thresholds for what actually counts as a difficulty – and therefore can withstand future adversities (Uekusa & Matthewman, 2017). This is evident in Pulvirenti and Mason's (2011) psychological study; refugee women developed resilience by surviving violence and social injustices. Roy et al. (2007) also found that their study respondents who had previously attempted to commit suicide showed significantly more psychological resilience than those who had never attempted to commit suicide. However, the earned strength of such socially vulnerable people can further mystify human resourcefulness and adaptation capacity to the new normal if its sources and potential limits are not properly analysed. While the whole community shows general resilience, such remarkable resilience can make some invisible, possibly a small number of more vulnerable people who struggle to withstand and cope with everyday hardships, let alone disasters.

We do not intend to convince disaster researchers to overemphasise psychological and individual resilience; rather, we need to build upon how psychological approaches to resilience can inform disaster researchers. As such, there is another reason to stop mystifying human resourcefulness and adaptation capacity; highly distressed and traumatised communities can remain resilient and may develop their higher reference points at the cost of individuals, some of whom may be reaching resilience tipping point(s). If resilience thinking keeps overgeneralising and mystifying human adaptation and endurance capacity, individual-level struggles are overlooked as "their problems" until psychological and social symptoms become severe enough as a community-level issue.

### *Community Resilience and Social Capital: Obscuring Individual-level Challenges to be Part of Resilience Building*

Our discussion here does not necessarily suggest that we simply include individual-level psychological resilience indicators into resilience frameworks. Indeed, despite the importance of emphasising a psychological approach, we have no intention of *individualising* resilience. It is the opposite. We intend to address such an important issue that, while individuals are responsibilised to be self-efficient, sustainable, and resilient, multidimensional and holistic community resilience approaches tend to obscure the issues of individual-level social vulnerability and ignore personal circumstances in disasters. In other words, excluding the notion of the limits of resilience from the conceptualisation of community resilience can further entrench the neoliberalisation of resilience and the responsibilisation of communities and, especially, individuals. The following section examines how the current integration of a social capital approach further obscures the limits of resilience and mystifies human resourcefulness in the conceptualisation of community resilience.

One of the main reasons that individual resilience is often overlooked in community resilience is due to an assumption that *as a collective, we can all withstand and cope with it*. Social capital is a critical concept in resilience approaches, often providing explanations for positive post-disaster outcomes (Aldrich, 2012; Mayer, 2019), yet it can create a serious issue if misinterpreted. Despite the importance of critically assessing community resilience in relation to people's mental wellbeing and psychological resilience, community spirit, solidarity, engagement, and resource sharing, typically observed during the "honeymoon" phase, often distract our attention from personal-level vulnerability and challenges. This is mainly because people develop shared psychosocial identities – resulting in unique disaster phenomenon called "emergency togetherness" – and are more likely to look after each other (Bonanno et al., 2010; Drury et al., 2019). Such a shared psychosocial identity in disasters and emergencies – *everyone is in the same boat* – can encourage civic engagement and mutual help and thus increase individual psychological resilience. We often witness the emergence and stories of disaster improvisation, mutual help, and altruism in the wake of disasters; this unique disaster phenomenon, often called *communitas,* has long been well-documented in disaster sociology (Matthewman & Uekusa, 2021). Shared psychosocial identity in emergencies can facilitate remarkable community resilience (Drury et al., 2019), but this tends to obscure the barriers and challenges that more vulnerable individuals face. We thus tend to overlook the excluded and isolated and their personal circumstances, particularly shaped by pre-existing social inequalities. The further identification of barriers and enablers for emergency togetherness (what others may call "disaster communitas" [Jencson, 2001; Matthewman, 2015; Matthewman & Uekusa, 2021], "disaster social capital" [Uekusa et al., 2020], "extraordinary communities" [Solnit, 2009], or "therapeutic communities" [Barton, 1969]) is beyond the scope of this paper, yet it is highly recommended to empirically and theoretically explore why such unique solidarity and resource-sharing in the wake of disasters may or may not emerge (see Matthewman & Uekusa, 2021).

When a disaster strikes, people selflessly help others, the hungry are fed, enemies help each other, resources are shared, and people become "resourceful" (Matthewman, 2015; Solnit, 2009). However, isolated individuals face heightened challenges to get by in disasters as they hypothetically receive less support than better-connected ones. Cases in point include: a disproportionally higher fatality rate among poor African American elders living alone in North Lawndale during the Chicago heat wave (Klinenberg, 2002); more "lonely deaths" among middle-aged men living alone after the 1995 Great Hanshin-Awaji earthquake (Nukada, 1999); and the rate of excess deaths from COVID-19 in the U.S. was higher among communities with weaker social capital (Fraser et al., 2021). Hikichi et al. (2018) also found that, following the 2011 Tohoku disaster, elderly survivors with stronger social capital tended to suffer less from cognitive disabilities than the socially isolated ones. Overall, many studies clearly show that social capital (also termed "social infrastructure" [Klinenberg, 2002, 2018]) is a critical source of community and psychological resilience (Hikichi et al., 2018). Therefore, it makes perfect sense to enhance people's social capital and civic engagement as a resilience promotion and DRR strategy. However, can their social capital capacity be mechanistically engineered, or can individuals be responsible for increasing their networking capacity? Like resilience, social capital is also contextual, multidimensional, and resource dependent. Instead of responsibilising individuals to enhance their social capital capacity, research needs to critically examine how some social structural factors help or hinder people's social capital capacities in disaster contexts. This is another area that needs further research.

We have no intention of overly criticising the current social capital approach. Overall, it has been positive that, as MacKinnon and Derickson (2013) note, "[t]he recent upsurge of interest in community resilience is not only a product of the 'top-down' strategies of government, but also of the 'bottom-up' activities of a wide variety of community-groups and environmental campaigns" (p.257). Zebrowski and Sage (2019) also note that "the idea of 'community resilience' signalled a shift from the traditional focus on the individual and household preparedness to the role of social networks in assisting response and recovery efforts" (p.64). However, what current critics of resilience warn is that overemphasising social capital and community resilience tends to responsibilise communities for being resilient without providing proper power and resources (Peck & Tickell, 2002). As U.S. American sociologist Alejandro Portes (1998, p.3) noted, social capital, just like resilience, is a convenient concept for researchers, practitioners, and policymakers alike to come up with inexpensive, non-economic solutions to major social problems. Ignoring the limits of resilience simply facilitates the interpretation of resilience in such a way that everyone is affected equally and can collectively cope with the disasters at any time, for as long and as much as they want, and with any people. If a community appears to be resilient, the message the community members send and receive among themselves is that they are all supposed to be resilient and not to complain about their personal circumstances in disasters because *they are all in the same boat*. We cannot overlook the fact that communities as coherent collectives have withstood and recovered from historical disasters; however, in reality, people are affected by disasters differently due to differential social vulnerability and capacity to respond. Even psychological resilience is highly associated with social status (e.g., following Hurricane Katrina and Rita, more devastating psychological effects were seen among the socially vulnerable such as African Americans, the poor, and single mothers; Zahran et al., 2011).

### *Further Theoretical and Practical Considerations for the Limits of Community Resilience*

When the level of an individual's stress and community distress crosses the tipping point, communities may collapse. So far, using interdisciplinary perspectives, we have tried to simplify this logic for the purpose of raising the inherent issues. As individual and community resilience is contextual and resource dependent, the tipping point should not be conceptualised as absolute. It is a dynamic and blurred point which may go higher or lower depending on the complex interaction of various adaptive capacities and multiple contributing factors. The theoretical notion that collective capacity for adaptation can reach a tipping point and decrease should be further examined, incorporating empirical evidence and synthesising the abovementioned critical perspectives.

There are different sources and manifestations of resilience in different times and spaces, so we should not emphasise unidimensional resilience and we need more holistic and flexible resilience theories. As discussed in previous sections, "community" resilience in disasters already assumes built-in support systems such that individuals help each other to cope with mental and emotional strains. This is why durable social capital is a crucial part of community resilience (Uekusa, 2018). However, as Bourdieu (1986) would argue, social capital in disaster contexts depends on other forms of capital and contextual factors. Uekusa and Matthewman (2017) argue that the socially disadvantaged had earned strength by coping with everyday disasters which became a critical resource, particularly manifested as social capital, for resilience to the 2010-2011 Canterbury and Tohoku disasters. However, for some of these residents with refugee backgrounds in Canterbury who had already gone through civil wars, displacement, poverty, and other forms of social oppression, these disasters were simply additional trauma that they did not want to deal with anymore and so they moved away from the affected areas. Thus, resilience could be understood as human nature, yet it is contextual, resource-dependent, and unpredictable even though durable social capital is often helpful as recently seen during the COVID-19 pandemic. Manyena (2006) argues that "[i]ndividuals, communities or nations have a degree of resilience, which can be defined in terms of their primary survival values or assets – life, livelihoods and culture" (p.439), and, without any adaptational capacities and resources, adaptation to adverse circumstances is less likely (e.g., Jedd, 2019; Kokorsch & Benediktsson, 2018). Even in ecosystems, "thresholds exist for populations of individual species and for individual processes within ecosystems, and ultimately for the ecosystems themselves" (Thompson, 2011, p.27).

Community resilience limits can be relatively higher if community members collectively cope with disasters. Those affected by disaster may be resilient for a certain period of time but may reach a point at which they cannot take it anymore and they "break", gradually or quickly decreasing their resilience. The resilience curve may have the potential break down or tipping

point. The logic here – that resilience can increase as adversity increases but only until it reaches the tipping point – can help disaster researchers to re-consider the concept of resilience. There is a hypothetical correlation between the level of disaster victims' mental wellbeing and the level of community altruism. The resilience tipping point is dynamic and likely to coincide with the end of the honeymoon disaster phase and during the disillusionment phase. In other words, when the level of community cohesion and public confidence is high, the level of resilience can generally increase. Indeed, during the initial lockdown period in response to the COVID-19 pandemic in 2020, we witnessed remarkable global resilience and some positives coming out of this adversity (Monbiot, 2020), but this did not seem to continue for a long time. We soon saw evidence of the limits to resilience ideas and discourse. As noted, this becomes more evident in technological and epidemic disasters in which community cohesion and resilience are less likely to emerge and residents often experience increased stress and mental health issues (McCormick et al., 2015; Palinkas et al., 1993). Then, as we see in Ōtautahi, what happens to long-term community resilience and recovery when stress is compounded by further disasters?

The obvious challenge here, in addition to a lack of empirical research, is the incommensurability of community resilience, unlike psychological studies which may focus on measurable factors such as stress, trauma, or mental health service access rates to capture the ups and downs of individuals' and groups' resilience in disasters. Indeed, in 2016, 5 years after the devastating earthquake in Ōtautahi, news media reported that mental health service providers were at breaking point (McLennan, 2016). We immediately wondered how much longer Ōtautahi residents need to endure and be resilient while the recovery governance took time to develop the recovery plans. In 2021, the situation had not improved much; rather, the 2019 terrorist attacks and the COVID-19 global pandemic have required residents to be more resilient and for longer. Following the initial COVID-19 lockdown in 2020, Harris (2020) reported that Ōtautahi, "the city of resilience", needed to embrace the tiresome burden of the resilience tag again: "The moniker that was once a badge of pride has now grown tiresome, a wearying arm around the shoulders that no-one wants anymore" (para.1). The recovery dilemma is widely discussed in the disaster recovery governance literature, referring to the conundrum of speed versus deliberation in disaster recovery (Olshansky, 2006). More democratic recovery processes take longer but rebuilding too quickly and randomly imposes massive long-term costs and risks on society (e.g., 2005 Hurricane Katrina). However, we argue that, as seen in Ōtautahi, recovery to *build back better but slower* assumes the residents' limitless resilience capacity to withstand and adapt to the waves of adversities. It is important, especially for practitioners and policymakers involved in recovery governance, to understand that there are people in the disaster-affected communities who might not have the option of not being (or taking a break from being) resilient. It is not uncommon for residents to sometimes exhibit burnout as they need to remain resilient in the face of perpetual crises (Donoghue & Edmiston, 2020).

## Discussion and Conclusion

While what we present in this paper may not be novel, it has made a few simple but important points to consider for future research. It is likely that, in the wake of rapid or slow onset adversities due to natural hazards or human-induced events such as the current COVID-19 pandemic, human beings will not usually give up adapting to the new normal due to our collective as well as individual adaptation capacities. However, this does not mean that individuals and communities can be perpetually resilient or endure for as much as and as long as they want, with any people. Appropriate support is needed, and underlying issues such as resource scarcity and social inequality need to be properly addressed (Uekusa, 2018).

As argued in this research, disregarding the limits of resilience is another way of mystifying the power of social capital, human resourcefulness, and adaptation capacity in order to justify the neoliberalisation of resilience and responsibilisation of communities and individuals (Chandler & Reid, 2016; Vilcan, 2017). Many critics have already warned that both resilience thinking and social capital approaches in disaster research and practice tend to overemphasise social agency and to be used as a convenient concept for policymakers to seek less costly, non-economic solutions to disaster damages and social problems in general (Chandler & Reid, 2016; Portes, 1998; Tierney, 2014). The term resilience should be used to respect and admire the communities and individuals who coped with and recovered from disasters. However, our point is that people cope because that is what they do, and most people persist with adapting to changes and challenges. Again, does this necessarily mean that they are resilient?

Psychological indicators of individual responses to disasters are difficult to include in community resilience

frameworks, yet it is clear that community-focused, deductive, and quantitative approaches disregard personal circumstances and proportionally small groups. Many empirical models such as the Baseline Resilience Indicators for Communities (BRIC) by Cutter and colleagues (2010) are available in disaster research but suffer from the limitations of deductive approaches. Furthermore, we assume that the lack of notion of the limits of resilience is due in part to the opportunistic nature of disaster research and the reliance on convenience sampling (Bonanno et al., 2014). Disaster researchers could look more at *failure* cases, in which people experienced or showed a significant sign of fatigue, limits of endurance, or collapse of communities. Even if the wellbeing of the majority of community members is high, those who may reach the tipping point should not be ignored. As the community members in many case studies remind us, there is a need for all experiences of disasters and recovery to be present and heard, not just those that reinforce a positive message of resilience without limits.

## Acknowledgements

The authors would like to thank the two anonymous reviewers, the journal editorial team, and the managing editor, Dr. Lauren Vinnell.

## Conflict of Interest

The authors declare no conflict of interest.

## Notes on contributors

Shinya Uekusa is a Lecturer in Sociology at the University of Canterbury, currently working on a HRC funded research project on the impacts of the COVID-19 pandemic on informal caregivers in Aotearoa New Zealand. His main research interest is in social vulnerability and resilience to disasters and climate change, focusing on the social disadvantaged such as immigrants, refugees, and linguistic minorities. Steve Matthewman is a Professor in Sociology at the University of Auckland. His last book on disasters was *Disasters, Risks and Revelation: Making Sense of Our Times* (2015). His current research project is a three-year Royal Society of New Zealand-funded work “Power Politics: Electricity and Sustainability in Post-Disaster Ōtautahi (Christchurch)”. The broad focus of this research is on how we build sustainability into the city. The narrow focus is on the place of renewable energy in this process.

## References

Adams-Hutcheson, G. (2015). Voices from the margins of recovery: Relocated Cantabrians in Waikato. *Kōtuitui: New Zealand Journal of Social Sciences Online, 10*(2), 135-134. https://doi.org/10.1080/1177083X.2015.1068184

Adeola, F.O., & Picou, J.S. (2014). Social capital and the mental health impacts of Hurricane Katrina: Assessing long-term patterns of psychosocial distress. *International Journal of Mass Emergencies and Disasters, 32*(1), 121-156.

Aldrich, D.P. (2012). *Building resilience: Social capital in post-disaster recovery*. University of Chicago Press.

Aldrich, D.P., & Meyer, M.A. (2015). Social capital and community resilience. *American Behavioral Scientist, 59*(2), 254-269. https://doi.org/10.1177/0002764214550299

Alexander, D.E. (2013). Resilience and disaster risk reduction: An etymological journey. *Natural Hazards and Earth System Sciences, 13*, 2707–2716. https:/doi.org/ 10.5194/nhess-13-2707-2013

Allen, J., Brown, L.M., Alpass, F.M., & Stephens, C.V. (2018). Longitudinal health and disaster impact in older New Zealand adults in the 2010-2011 Canterbury earthquake series. *Journal of Gerontological Social Work, 61*(7), 701-718. https://doi.org/10.1080/01634372.2018.1494073

Barton, A.H. (1969). *Communities in disasters: A sociological analysis of collective stress situations.* Doubleday.

Beaglehole, B., Mulder, R.T., Moden, J.M., & Bell, C.J. (2019). A systematic review of the psychological impacts of the Canterbury earthquakes on mental health. *Australian and New Zealand Journal of Public Health,* 43, 274-280. https://doi.org/10.1111/1753-6405.12894

Beccari, B. (2016). A comparative analysis of disaster risk, vulnerability and resilience composite indicators. *PLoS Currents Disasters, 14*(8). https://doi.org/10.1371/currents.dis.453df025e34b682e9737f95070f9b970

Berkes, F. (2007). Understanding uncertainty and reducing vulnerability: Lessons from resilience thinking. *Natural Hazards, 41*, 283-295. https://doi.org/10.1007/s11069-006-9036-7

Blundell, S. (2018, May 3). *How the Christchurch earthquakes devastated mental-health services.* Noted. www.noted.co.nz/currently/social-issues/how-christchurch-earthquakes-devastated-mental-health/

Bonanno, G.A., Brewin, C.R., Kaniasty, K., & La Greca, A.M. (2010). Weighing the cost of disaster: Consequences, risks and resilience in individuals, families and communities. *Psychological Science in the Public Interest, 11*(1), 1-49. https://doi.org/10.1177/1529100610387086

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (ed.), *Handbook of theory for the sociology of education* (pp. 241–258). Greenwood Press.

Callister, W.D., & Rethwisch, D.G. (2012). *Fundamentals of materials science and engineering – An integrated approach.* John Wiley and Sons.

Chandler, D., & Reid, J. (2016). *The neoliberal subject: Resilience, adaptation and vulnerability.* Rowman & Littlefield International Ltd.

Crowley, K., & Elliott, J.R. (2012). Earthquake disasters and resilience in the global North: Lessons from New Zealand and Japan. *Geographical Journal, 178*(3), 208-215. https://10.1111/j.1457-4959.2011.00453.x

Cutter, S.L., Burton, C.G., & Emrich, C.T. (2010). Disaster resilience indicators for benchmarking baseline conditions.

*Journal of Homeland Security and Emergency Management, 7*(1), 1-22. https://doi.org/10.2202/1547-7355.1732

Donoghue, M., & Edmiston, D. (2020). Gritty citizens? Exploring the logic and limits of resilience in UK social policy during times of socio-material insecurity. *Critical Social Policy, 40*(1), 7–29. https://doi.org/10.1177/0261018319825547

Drury, J., Carter, H., Cocking, C., Ntontis, E., Guven, S.T., & Amlôt, R. (2019). Facilitating collective psychosocial resilience in the public in emergencies: Twelve recommendations based on the social identity approach. *Frontiers in Public Health, 7*(141), 1-21. https://doi.org/10.3389/fpubh.2019.00141

Emhail, I. (2019, March 24). *Refugees anxious after Christchurch terror attacks*. RNZ. www.rnz.co.nz/news/national/385452/refugees-anxious-after-christchurch-terror-attacks

Fletcher, D., & Sarkar, M. (2013). Psychological resilience: A review and critique of definitions, concepts, and theory. *European Psychologist, 18*(1), 12-23. https://doi.org/10.1027/1016-9040/a000124

Folke, C., Jansson, A., Rockström, J., Olsson, P., Carpenter, S.R., Chapin, F.S. III, Crépin, A.S., Daily, G., Danell, K., Ebbesson, J., Elmqvist, T., Galaz, V., Moberg, F., Nilsson, M., Osterblom, H., Ostrom, E., Persson, A., Peterson, G., Polasky, S., … Westley F (2011). Reconnecting to the biosphere. *Ambio, 40*(7), 719-738. https://doi.org/10.1007%2Fs13280-011-0184-y

Fraser, T., Aldrich, D.P., & Page-Tan, C. (2021). Bowling alone or distancing together? The role of social capital in excess death rates from COVID19. *Social Science & Medicine, 284*, 114241. https://doi.org/10.1016/j.socscimed.2021.114241

Frerks, G., Warner, J., & Weijs, B. (2011). The politics of vulnerability and resilience. *Ambiente & Sociedade, 14*(2), 105–122. https://doi.org/10.1590/S1414-753X2011000200008

Gill, D.A., & Picou, S.J. (1998). Technological disaster and chronic community stress. *Society and Natural Resources, 11*, 795-815. https://doi.org/10.1080/08941929809381119

Gordon, J.E. (1978). *Structures.* Penguin Books.

Groffman, P.M., Baron, J.S., Blett, T., Gold, A.J., Goodman, I., Gunderson, L.H., Levinson, B.M., Palmer, M.A., Paerl, H.W., Peterson, G.D., Poff, N.L., Rejeski, D.W., Reynolds, D.W., Turner, M.G., Weathers, K.C., & Wiens, J. (2006). Ecological thresholds: The key to successful environmental management or an important concept with no practical application? *Ecosystems, 9*, 1-13. https://doi.org/10.1007/s10021-003-0142-z

Harris, D. (2020, April 9). *Coronavirus: Christchurch must again embrace tiresome 'city of resilience' tag*. Stuff. www.stuff.co.nz/business/120953901/coronavirus-city-of-resilience--how-christchurch-will-rise-yet-again-from-tragedy

Hayward, B. (2013). Rethinking resilience: Reflections on the earthquakes in Christchurch, New Zealand, 2010 and 2011. *Ecology and Society, 18*(4), 37. http://doi.org/10.5751/ES-05947-180437

Hayward, M. (2018, February 22). *Seven years on: Seven challenges for post-quake Christchurch.* Stuff. www.stuff.co.nz/the-press/business/the-rebuild/101478063/seven-years-on-seven-challenges-for-postquake-christchurch

Hikichi, H., Aida, J., Matsuyama, Y., Tsuboya, T., Kondo, K., & Kawachi, I. (2018). Community-level social capital and cognitive decline after a natural disaster: A natural experiment from the 2011 Great East Japan earthquake and tsunami. *Social Science and Medicine, 257*, 111981. https://doi.org/10.1016/j.socscimed.2018.09.057

Holling, C.S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics, 4*, 1–23. https://doi.org/10.1146/annurev.es.04.110173.000245

Jedd, T.M. (2019). The limits of resilience in US community responses to recent drought events. *Community Development, 50*(2), 141-159. https://doi.org/10.1080/15575330.2019.1574850

Jencson, L. (2001). Disastrous rites: Liminality and communitas in a flood crisis. *Anthropology and Humanism, 26*(1), 46-58. https://doi.org/10.1525/ahu.2001.26.1.46

Klinenberg, E. (2002). *Heat wave: A social autopsy of disaster in Chicago.* University of Chicago Press.

Klinenberg, E. (2018). *Palaces for the people: How social infrastructure can help fight inequality, polarization, and the decline of civic life.* Broadway Books.

Kokorsch, M., & Benediktsson, K. (2018). Where have all the people gone? The limits of resilience in coastal communities. *Norwegian Journal of Geography, 72*(2), 97-114. https://doi.org/10.1080/00291951.2018.1450289

Kukihira, H., Yamawaki, N., Uchiyama, K., Arai, S., & Horikawa, E. (2014). Trauma, depression, and resilience of earthquake/tsunami/nuclear disaster survivors of Hirono, Fukushima, Japan. *Psychiatry and Clinical Neurosciences, 68*(7), 524-533. https://doi.org/10.1111/pcn.12159

Kunii, Y., Suzuki, Y., Shiga, T., Yabe, H., Yasumura, S., Maeda, M., Niwa, S., Otsuru, A., Mashiko, H., & Abe, M. (2016). Severe psychological distress of evacuees in evacuation zone caused by the Fukushima Daiichi Nuclear Power Plant accident: The Fukushima Health Management Survey. *PLoS One, 11*(7), 1-15. https://doi.org/10.1371/journal.pone.0158821

Lee, J., Blackmon, B.J., Cochran, D.M., Kar, B., Rehner, T.A., & Gunnell, M.S. (2018). Community resilience, psychological resilience, and depressive symptoms: An examination of the Mississippi Gulf Coast 10 years after Hurricane Katrina and 5 years after the Deepwater Horizon oil spill. *Disaster Medicine and Public Health Preparedness, 12*(2), 241-248. https://doi.org/10.1017/dmp.2017.61

Lyons, A., Fletcher, G., & Bariola, E. (2016). Assessing the well-being benefits of belonging to resilient groups and communities: Development and testing of the Fletcher-Lyons Collective Resilience Scale (FLCRS). *Group Dynamics: Theory, Research and Practice, 20*(2), 65-77. https://doi.org/10.1037/gdn0000041

MacKinnon, D., & Derickson, K.D. (2014). From resilience to resourcefulness: A critique of resilience policy and activism. *Progress in Human Geography, 37*(2), 253-270. https://doi.org/10.1177/0309132512454775

Manyena, S.B. (2006). The concept of resilience revisited. *Disasters, 30*, 433-450. https://doi.org/10.1111/j.0361-3666.2006.00331.x

Marlowe, J. (2015). Belonging and disaster recovery: Refugee-background communities and the Canterbury earthquakes. *British Journal of Social Work, 45*(1), i188-i204. https://doi.org/10.1093/bjsw/bcv090

Masten, A.S. (2001). Ordinary magic: Resilient processes in development. *American Psychologist, 56*(3), 227–238. https://doi.org/10.1037/0003-066X.56.3.227

Masten A.S., Best, K., & Garmezy, N. (1990). Resilience and development: Contributions from the study of children who overcome adversity. *Development and Psychopathology,* 2, 425–444. https://doi.org/10.1017/S0954579400005812

Masterson, J.H., Peacock, W.G., Van Zandt, S.S., Grover, H., Schwarz, L.F., & Cooper Jr., J.T. (2014). *Planning for community resilience.* Island Press.

Math, S.B., Nirmala, M.C., Moirangthem, S., & Kumar, N.C. (2015). Disaster management: Mental health perspective. *Indian Journal of Psychological Medicine, 37*(3), 261-271. https://doi.org/10.4103/0253-7176.162915

Matthewman, S. (2015). *Disasters, risks and revelation: Making sense of our times.* Palgrave Macmillan.

Matthewman, S., & Uekusa, S. (2021). Theorizing disaster communitas. *Theory and Society, 50*, 965-984. https://doi.org/10.1007/s11186-021-09442-4

Mayer, B. (2019). A review of the literature on community resilience and disaster recovery. *Current Environmental Health Reports, 6*, 167-173. https://doi.org/10.1007/s40572-019-00239-3

McClure, T. (2016, August 13). *Christchurch dilemmas: Christchurch's mental health crisis*. Stuff. www.stuff.co.nz/national/health/83124349/christchurch-dilemmas-christchurchs-mental-health-crisis

McCormick, L.C., Tajeu, G.S., & Klapow, J. (2015). Mental health consequences of chemical and radiological emergencies. *Emergency Medicine Clinics of North America, 33*, 197-211.

McIntosh, P. (2007). White privilege: Unpacking the invisible knapsack. In M. L. Anderson & P.H. Collins (Eds.), *Race, class and gender: An anthropology* (6th ed., pp.98-102). Thomson Wadsworth.

McLennan, E. (2016, June 2). Christchurch mental health services at 'breaking point'. *New Zealand Herald*. www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11649597

Mills, C.W. (1959). *The sociological imagination.* Oxford University Press.

Mitchell, C., McGregor, I., & Williams, A. (2019, September). Red to green: The evolution of a city's abandoned acres. *Stuff*. https://interactives.stuff.co.nz/2019/09/christchurch-red-zone-to-green/

Monbiot, G. (2020, March 31). The horror films got it wrong. This virus has turned us into caring neighbours. *The Guardian.* www.theguardian.com/commentisfree/2020/mar/31/virus-neighbours-covid-19

Moore, J.C. (2018). Predicting tipping points in complex environmental systems. *PNAS, 115*(4), 635-636. https://doi.org/10.1073/pnas.1721206115

Neal, Z.P. (2012). Community. *Oxford Bibliographies, 115*(4), 635-636. https://doi.org/10.1093/OBO/9780199756384-0080

Norris, F.H., Tracy, M., & Galea, S. (2009). Looking for resilience: Understanding the longitudinal trajectories of response to stress. *Social Science and Medicine, 68*, 2190-2198. https://doi.org/10.1016/j.socscimed.2009.03.043

Nukada, I. (1999). *Kodokushi (Lonely Deaths): Human recovery in the affected areas in Kobe* (translation ours). Tokyo: Iwanami Shoten.

O'Brien, G., O'Keefe, P., Rose, J., & Wisner, B. (2006). Climate change and disaster management. *Disasters, 30*, 64–80. https://doi.org/10.1111/j.1467-9523.2006.00307.x

Obrist, B., Pfeiffer, C., & Henley, R. (2010). Multi-layered social resilience: A new approach in mitigation research. *Progress in Development Studies, 10*, 283–293. https://doi.org/10.1177/146499340901000402

Olshansky, R.B. (2006). Planning after Hurricane Katrina. *Journal of American Planning Association, 72*(2), 147-153. https://doi.org/10.1080/01944360608976735

Olsson, L., Jerneck, A., Thoren, H., Persson, J., & O'Byrne, D. (2015). Why resilience is unappealing to social science: Theoretical and empirical investigations of the scientific use of resilience. *Science Advances, 1*(4), e1400217. https://doi.org/10.1126/sciadv.1400217

Orui, M., Suzuki, Y., Maeda, M., & Yasumura, S. (2018). Suicide rates in evacuation areas after the Fukushima Daiichi Nuclear Disaster: A 5-year follow-up study in Fukushima Prefecture. *Crisis: The Journal of Crisis Intervention and Suicide Prevention, 39*(5), 353-363. https://doi.org/10.1027/0227-5910/a000509

Palinkas, L.A., Downs, M.A., Petterson, J.S., & Russell, J. (1993). Social, cultural and psychological impacts of the Exxon Valdez Oil Spill. *Human Organization, 52*(1), 1-13. https://doi.org/10.17730/humo.52.1.162688w475154m34

Payne, P.R., Kaye-Blake, W.H., Stirrat, K.A., Ellison, R.A., Smith, M.J., & Brown, M. (2019). Identifying resilience dimensions and thresholds: Evidence from four rural communities in New Zealand. *Resilience: International Policies, Practices and Discourses, 7*(2), 149-171. https://doi.org/10.1080/21693293.2018.1545339

Peck, J., & Tickell, A. (2002). Neoliberalising space. *Antipode, 34*, 380-404. https://doi.org/10.1111/1467-8330.00247

Picou, S.J., Marshall, B.K., & Gill, D.A. (2004). Disaster, litigation, and the corrosive community. *Social Forces, 82*(4), 1493-1522. https://doi.org/10.1353/sof.2004.0091

Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology, 24*, 1-24. https://doi.org/10.1146/annurev.soc.24.1.1

Potter, S.H., Becker, J., Johnston, D.M., & Rossiter, K.P. (2015). An overview of the impacts of the 2010–2011 Canterbury earthquakes. *International Journal of Disaster Risk Reduction, 14*(1), 6–14. https://doi.org/10.1016/j.ijdrr.2015.01.014

Pulvirenti, M., & Mason, G. (2011). Resilience and survival: Refugee women and violence. *Current Issues in Criminal Justice, 23*, 37-52. https://doi.org/10.1080/10345329.2011.12035908

Rao, H., & Greve, H.R. (2018). Disasters and community resilience: Spanish Flu and the formation of retail cooperatives in Norway. *Academy of Management Journal, 61*(1), 5–25. https://doi.org/10.5465/amj.2016.0054

Resilience Alliance. (2007). *Assessing resilience in social-ecological systems: A practitioner's workbook, Version 1.0.*

Robinson, G.M., & Carson, D.A. (2016). Resilient communities: Transitions, pathways and resourcefulness. *The Geographical Journal, 182*, 114-122. https://doi.org/10.1111/geoj.12144

Rowney, C., Farvid, P., & Sibley, C.G. (2014). 'I laugh and say I have Earthquake Brain!': Resident response to the September 2010 Christchurch Earthquake. *New Zealand Journal of Psychology, 43*(2), 4-13.

Roy, A.I., Sarchiapone, M., & Carli, V. (2007). Low resilience in suicide attempters. *Archives of Suicide Research, 11*(3), 265-269. https://doi.org/10.1080/13811110701403916

Solnit, R. (2009). *A paradise built in hell: The extraordinary communities that arise in disasters.* Viking.

Thiri, M.A. (2017). Social vulnerability and environmental migration: The case of Miyagi Prefecture after the Great East Japan Earthquake. *International Journal of Disaster*

*Risk Reduction, 25*, 212-226. https://doi.org/10.1016/j.ijdrr.2017.08.002

Thompson, I. (2011). Biodiversity, ecosystem thresholds, resilience and forest degradation. *Unasylva, 238*(62), 25-30.

Thrush, S.F., Hewitt, J.E., Dayton, P.K., Coco, G., Luhrer, A.M., Norkko, A., Norkko, J., & Chiantore, M. (2009). Forecasting the limits of resilience: Integrating empirical research with theory. *Proceedings of The Royal Society B, 276*, 3209-3217. https://doi.org/10.1098/rspb.2009.0661

Tierney, K. (2014). *The social roots of risk: Producing disasters, promoting resilience*. Stanford University Press.

Uekusa, S. (2018). Rethinking resilience: Bourdieu's contribution to disaster research. *Resilience: International Policies, Practices and Discourses, 6*(3), 181-195. https://doi.org/10.1080/21693293.2017.1308635

Uekusa, S., & Matthewman, S. (2017). Vulnerable and resilient? Immigrants and refugees in the 2010-2011 Canterbury and Tohoku disasters. *International Journal of Disaster Risk Reductions, 22*, 355-361. https://doi.org/10.1016/j.ijdrr.2017.02.006

Uekusa, S., Matthewman, S., & Lorenz, D.F. (2022). Conceptualizing disaster social capital: What it is, why it matters and how it can be enhanced. *Disasters, 46*(1), 56-79. https://doi.org/10.1111/disa.12470

Ungar, M. (2011). Community resilience for youth and families: Facilitative physical and social capital in contexts of adversity. *Children and Youth Services Review, 33*(9), 1742-1748. https://doi.org/10.1016/j.childyouth.2011.04.027

Vilcan, T. (2017). Articulating resilience in practice: Chains of responsibilization, failure point and political contestation. *Resilience: International Policies, Practices and Discourses, 5*(1), 29-43. https://doi.org/10.1080/21693293.2016.1228157

Wilson, G. (2012). *Community resilience and environmental transitions.* Taylor & Francis.

Wilson, G. (2013). Community resilience, social memory and the post-2010 Christchurch (New Zealand) Earthquakes. *AREA, 45*(2), 207-215. https://doi.org/10.1111/area.12012

Windle, G. (2011). What is resilience? A review and concept analysis. *Reviews in Clinical Gerontology, 21*(2), 152-169. https://doi.org/10.1017/S0959259810000420

Yasumura, S. (2019). The Great East Japan Earthquake, the Fukushima Daiichi Nuclear Power Plant accident, and elderly health. In M. Washino & C. Kiyohara (Eds.), *Health issues and care system for the elderly* (pp.185-196). Springer.

Zahran, S., Peek, L., Snodgrass, J.G., Weiler, S., & Hempel, L. (2011). Economics of disaster risk, social vulnerability, and mental health resilience. *Risk Analysis, 31*(7), 1107-1119. https://doi.org/10.1111/j.1539-6924.2010.01580.x

Zebrowski, C., & Sage, D. (2016). Organising community resilience. In J. Bohland, S. Davoudi, & J.L. Lawrence (Eds.), *The resilience machine* (pp.62-79). Routledge.