

# Is “Fear Itself” The Only Thing We Have To Fear? Explorations of Psychology in Perceptions of the Vulnerability of Others

James Lewis<sup>1</sup>

Ilan Kelman<sup>2</sup>

Sarah A V Lewis<sup>3</sup>

## <sup>1</sup> James Lewis

Email: [datum@gn.apc.org](mailto:datum@gn.apc.org)  
 Web: <http://datum.gn.apc.org>  
 Phone: +44-1225-891426  
 Post: Datum International, 101 High Street, Marshfield,  
 Chippenham, Wiltshire. SN14 8LT, United Kingdom.

James Lewis' research and writing on the origins and causes of vulnerability to natural hazards extends to social geography, political economy, corruption, island histories, climate change, and interconnections with socio-economic capacity and development.

## <sup>2</sup> Ilan Kelman

Email: [ilan\\_kelman@hotmail.com](mailto:ilan_kelman@hotmail.com)  
 Web: <http://www.ilankelman.org>  
 Phone: +47-2285-8566  
 Fax: +47-2285-8751  
 Post: CICERO (Center for International Climate and  
 Environmental Research - Oslo),  
 P.O. Box 1129, Blindern, Oslo, Norway, N-0318

Ilan Kelman's main research and advocacy work relates to two areas. First, island sustainability, creating and maintaining safer and healthier communities on islands and in other isolated areas. Second, disaster diplomacy, how and why disaster-related activities do and do not reduce conflict and create peace.

## <sup>3</sup> Sarah A V Lewis

mail: [sarah\\_lewis@mac.com](mailto:sarah_lewis@mac.com)  
 Phone: +44-1225-891426  
 Post: 101 High Street, Marshfield, Chippenham, Wiltshire. SN14  
 8LT, United Kingdom.

Sarah Lewis is a retired National Health Service art psychotherapist and researcher. She now works as a trustee with a voluntary community arts therapies project for people of all ages and with mental health difficulties.

© The Author(s) 2011. (Copyright notice)

## Author correspondence:

James Lewis, Datum International, 101 High Street,  
 Marshfield, Chippenham, Wiltshire. SN14 8LT,  
 United Kingdom.  
 Email: [datum@gn.apc.org](mailto:datum@gn.apc.org)

URL: [http://trauma.massey.ac.nz/issues/2011-3/AJDTs\\_2011-3\\_03\\_Lewis.pdf](http://trauma.massey.ac.nz/issues/2011-3/AJDTs_2011-3_03_Lewis.pdf)

## Abstract

*This paper highlights the importance of understanding and exploring some psychological aspects of perceptions of the vulnerability of others that contribute to disasters. Despite decades of research suggesting how to improve, fear and denial of vulnerability are too frequently seen in practice. These points are corroborated through comparative contexts in financial management,*

*industrial disaster, social care, construction, and climate change. Post-disaster publication of independent, comprehensive, and analytical reports explaining why disasters occurred would identify practical steps for countering aspects of fear and denial that contribute to risk and disasters.*

**Keywords:** *fear, denial, psychology, vulnerability*

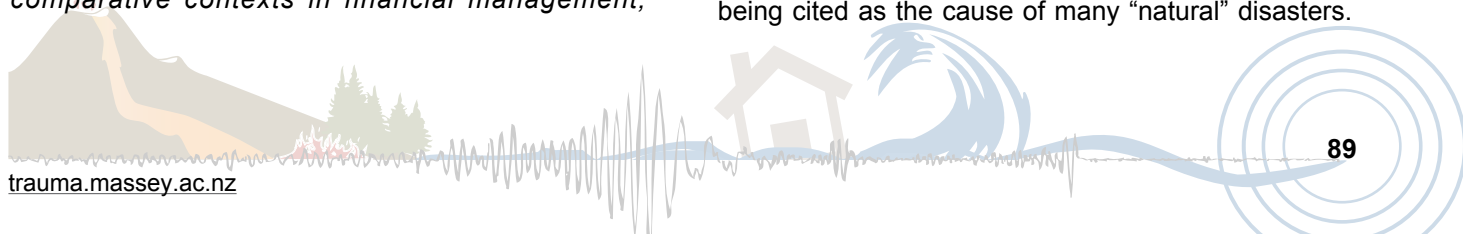
## Introduction

*“The restorations of productivity and reimposing of ‘normal’ relations become the main prescriptions of crisis management, relief and reconstruction. The ability to predict or contain natural processes in a technocratic framework becomes the main goal for disaster prevention. Now, I question whether this recognises some major, indeed the major, ingredient of disaster”* (Hewitt, 1983, p. 29).

Hewitt's (1983) concern is that the major ingredient of disaster is society's vulnerability. Attempts to control natural processes ignore the human element in deciding where and how to live, especially regarding interacting with nature. That is, creating vulnerability to nature is the root cause of disasters. Conversely, controlling nature does not tackle vulnerability and can, in fact, increase it (e.g. Etkin, 1999; Fordham, 1999). More importantly, from Hewitt (1983), one sector within society often decides where and how others should live, thereby creating vulnerability for others without the others having a say.

It can be rare for this major ingredient of vulnerability to be acknowledged and tackled head on by decision makers. That is especially the case within decision structures rooted in a paradigm preferring to blame something else, usually nature, for disasters. Additionally, political advantages accrue when blame can be attributed elsewhere rather than admitting the failures of oneself or one's community in actions that created the vulnerability. In seeking explanations of disasters, has it, in fact, become too easy for external influences to displace internal shortcomings as the causes of vulnerability of oneself or of others?

A contemporary interpretation is climate change being cited as the cause of many “natural” disasters.



Yet tropical cyclones, wildfires, floods, and storms resulted in devastation long before climate change was a concern. Certainly, climate change is affecting all these phenomena, sometimes exacerbating them (IPCC, 2007). Yet they all led to disasters before climate change, so climate change cannot be considered a root cause. Normalised European flood losses, for example, increased from 1970 to 2006 due to societal factors, not due to climate change (Barredo, 2009).

As yet, climate change impacts on major earthquakes are speculation (McKie, 2009). There are linkages with landslides (e.g. Schmidt & Dehn, 2006), volcanoes through sea level rise (Mason et al., 2004), and potentially tsunamis if sea level rises sufficiently to permit tsunamis to travel farther inland. But those natural forces are involved in disasters irrespective of climate change.

Meanwhile, most of the same vulnerability factors that cause disasters are present, irrespective of climate change. It is easy and populist to blame environmental forces that often become 'hazards' or that are significantly affected by humanity, such as climate change. Instead, it would be appropriate to further explore other contributors to disaster causes, namely Hewitt's major ingredient of disaster: vulnerability.

## Vulnerability creation

The dividing off of hazards from their real context of human-environment relations perpetuates the myths of "ordinary life" and "normality" as being hazard-free (Hewitt, 1983). Protected by centralised technocratic functions, it is this approach that eventually leads to the failure and destruction of what is being "protected". Hewitt (1983) instead explains that disasters are characteristic, not accidental features, of the places and societies in which they occur and that risk emanates mainly from decisions and activities made manifest by "ordinary life" (p. 25). Hewitt continues: "What I believe to be definitive of the disasters I have examined is, however, that most of them would not be disasters, and many of the damages would not (indeed do not) occur except as a direct result of characteristic and vulnerable human developments" (p. 27).

Hewitt's (1983) evidence supports research results (e.g. O'Keefe et al., 1976) based upon the assertion that disasters are not natural, but that casualties and losses are caused by humans and human settlements being obliged to accept vulnerable locations or disadvantaged opportunities. Covering the long history of vulnerability

theory, this view reminds us of our pusillanimous attitudes to change. As yet, there is little sign of that view's acceptance, comprehension or practise beyond lip service and some field applications nominally linked to post-disaster assistance. The view has been labelled "radical" for so long because there has been so little application in practice. Why should this be?

One aspect of the radical view is that "...disaster relief has been assumed to be the totality of necessary action for disasters and not to involve any but the department of that designation ...Not only does institutional separation reflect shortcomings in the understanding of the crucial relationship between vulnerability, disasters and development – but it denies the opportunity that integration would offer for strategic development for vulnerability reduction" (Lewis, 1999, p. 132). Separation also impedes opportunity for crucial inter-sectoral and inter-disciplinary understanding and cross-checking required to ensure validity and efficacy on-the-ground of institutionalised policy making.

Until natural hazards are seen as a part of society's contexts, and until society sees itself as part of the environment and not separate from it, with which many traditional and indigenous outlooks concur, the hazards- and relief-focused views of disasters will remain a part of the problem, not a part of its answer. Additionally, "understanding of the causes of vulnerability has not been helped by globalized and institutionalized conceptions of disasters in distant places. Vulnerability is pervasive in local, community, and domestic contexts and our insights into its often invidious processes have to be achieved at similar levels of application" (Lewis, 2007, online).

Consequently, society tends to be more active in creating people's vulnerability (Lewis, 2008a) than it is at reducing it (Lewis, 1999). Perpetrations of "characteristic and vulnerable" development continue. For instance, relatively recent, widespread building on river floodplains across central Europe is alleged to have been a significant cause of flood losses in 2002 (Pearce, 2002). Former wetlands had been drained to provide more sites and rivers with high embankments "channelled" to reduce meanders, inducing sudden surges where, in the past, floodwaters would have been delayed for weeks across the plains. "Greedy mayors" are blamed for destroying forests to provide building land for "holiday homes on the banks of rivers" (Pearce, 2002) and enticing their own populations onto the floodplains (Lewis & Kelman, 2010).

More specifically, in the UK in July 2008, families in Gloucestershire and Hull, whose houses were flooded in July 2007, continued to live in unhealthily overcrowded temporary accommodation such as caravans and mobile homes (Morris, 2008). Extraordinary resilience was displayed by the owners of newly built houses, all with planning permission and bought in good faith, against an inexorable hazard made manifest by decisions beyond their influence and about which they could do nothing. Meanwhile, housing construction on UK flood plains continues against specialist advice to central and local governments (e.g. Werritty, 2006).

The official report of the Gloucestershire and Hull 2007 floods (Pitt, 2008) might be an exception amongst natural hazards reports in aiming to address root causes. Subsequent policy statements based on it may or may not result in action against disaster-causing practises (e.g. CIWEM et al., 2009). The words used here must be careful because similar recommendations were made after previous floods around the UK in 1998 (Bye & Horner, 1998) and 2000 (EA, 2001), yet what has changed with respect to vulnerability?

### Is vulnerability unprecedented?

Vulnerability, the inadequately understood process by which susceptibility of people, infrastructure, communities, and environments accrues (Lewis & Kelman, 2010), appears to be increasing faster than the implementation of disaster risk reduction measures. Physical sciences of natural hazards have contributed extensively to disaster risk reduction and continue to do so. They rarely provide pre-emptive measures against the socio-economic causes of disasters. That requires a focus on vulnerability, for which accurate and realistic perception of the vulnerability of others is required.

As Hewitt (1983), observed, the very fabric of development, productivity and construction is administered in such a way as to bring about causes and sources of vulnerability to natural processes. The act of separating “disaster management” from other sectors of government administrations allows the creation of vulnerability (Lewis, 2008a) to be obscured and losses to be perpetrated by other departments under the name of “development” (Lewis, 1999).

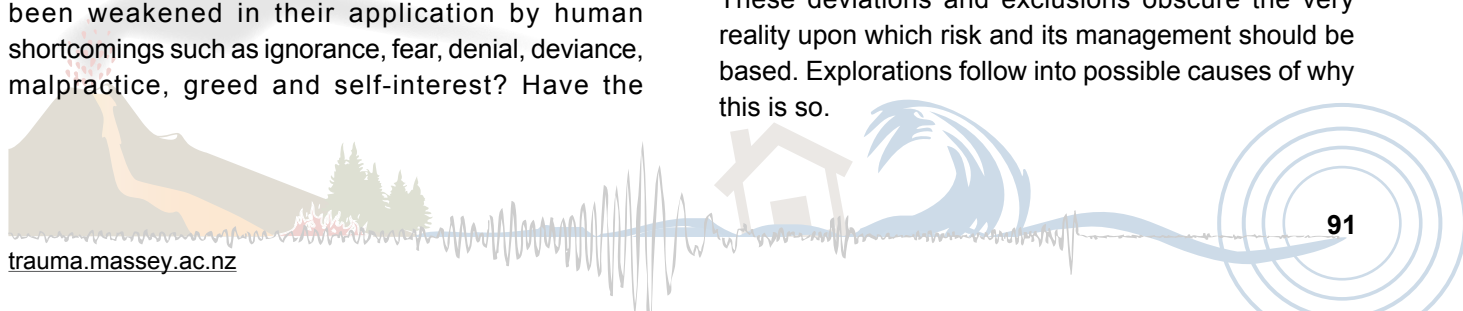
Have “advanced” institutional and technical measures been weakened in their application by human shortcomings such as ignorance, fear, denial, deviance, malpractice, greed and self-interest? Have the

instruments of the technocratic view, that often dominate this discourse, failed as policy? Has inadequacy in their implementation exacerbated the vulnerability they created? More simply, is it that levels of risk and counter-measures have escaped the rigorous consideration that they require and have been made on the basis of over-casual judgements? As Gaillard et al. (2010) note, such judgements can easily blame external forces or ascribe epithets such as “unpreventable”, “accidental”, and “unprecedented” that inappropriately seek to absolve responsibility.

So-called “unprecedented” happenings should be recognised as part of the reality of prevailing risk, since extreme events occur in any society, region or sector of activity. Consider, for example, Hurricane Katrina in New Orleans (2005); earthquake destruction in China (2008) and Haiti (2010); an earthquake and tsunami in Chile (2010); and genocide in Rwanda (1994) and Srebrenica (1995). These are realities seemingly beyond comprehension. Yet China denied investigation into the deaths of schoolchildren in the 2008 earthquake; Chile denied the need for international assistance after the 2010 earthquake and tsunami, just as the USA tried after Hurricane Katrina; and forces unleashed by climate change accrue whilst being denied. None of these extremes was unprecedented. They were excluded from many judgements regarding disaster risk reduction, seemingly due to administrative expediency.

On the one hand, a “*paradigme de l'extrême*” emphasises large magnitude rare events, leading to disasters being considered outside the normal social fabric—even though it is “the normal social fabric” that has induced vulnerability and causes disasters (Gaillard et al., 2010). On the other hand, Chichilnisky (2009ab) determines how humans are insensitive to rare events such as catastrophes, and that the notion of utility and rationality “underestimates our responses to rare events no matter how catastrophic they may be” Chichilnisky (2009a, p. 808). That suggests that utility and rationality are unnatural and contrary to experimental evidence. Even Hewitt (1983) makes an exception of the extreme by his statement that: “There are natural forces and some damages in most disasters that lie beyond all reasonable measures any society could make to avoid them” (Hewitt, 1983, p. 27).

These deviations and exclusions obscure the very reality upon which risk and its management should be based. Explorations follow into possible causes of why this is so.



## Decision-related causes of disasters

Whatever the extent and scale of comprehension and inclusivity within some institutions, susceptibility to what commonly is called “human error” - or “system error”, trying to de-humanise and diffuse responsibility - pervades many institutions. It also pervades the management and administration of humanitarian undertakings but, in reality, the “error” may have resulted from a human condition. Whilst psychological and emotional consequences *among survivors* of disasters have been acknowledged (e.g. Wisner et al., 2004), and those upon children and other disaster survivors now receive active professional response (e.g. Chemtob et al., 2002; Hodgkinson & Stewart, 1998), “human error” in decision making is in need of further examination.

For most organisations in the field, views and opinions concerning the causes and consequences of hazards may vary. Nevertheless, they share one aspect in common: limited visible attention has been given to the possibility of variations in perception and reason as a result of human emotional responses. Guidance, where it is available, is given for the psychological equivalent of a “level playing field” and as if all players conformed to a behavioural “norm”. Such assumption is not realistic; it does not accord with how well people are, or not, how their behaviour may vary, or how psychological variability could be an influence upon their reasoning; nor does it take account of previous experiences.

Reason may not be as pure as most of us think it is or would wish it to be:

...emotions and feelings may not be intruders in the bastion of reason at all: they may be enmeshed in its networks, for worse and for better. The strategies of human reason probably did not develop, in either evolution or any single individual, without the guiding force of the mechanisms of biological regulation, of which emotion and feeling are notable expressions... This does not deny that emotions and feelings can cause havoc in the process of reasoning under some circumstances. Traditional wisdom has told us they can, and recent investigations...reveal the potentially harmful influence of emotional biases (Damasio, 1994 pp. xxii, 245-246).

Crozier et al. (2006) and McClure et al. (2009) provide empirical evidence from residents’ attitudes in Wellington Region, New Zealand to preparing for an earthquake. Both studies found that the framing of

the problem influences people’s reasoning regarding preparedness. Within their sample, McClure et al. (2009) show that people are more likely to prepare when the consequence is framed as possible harm rather than as survival possibilities. Meanwhile, Crozier et al.’s (2006) sample responded more actively to information on earthquake preparedness if they were in a low-hazard zone than in a high-hazard zone—which some might see as being counterintuitive.

As another example, the decision-related causes of the “financial tsunami” (the global financial crisis of 2008-2009), undertaken in depth and detail to an extent rarely experienced following disasters involving natural processes, showed decision making to have been overwhelmed by emotional behaviour (Chapman, 2009). Could it be the case that management in other sectors is similarly susceptible to the influences of personal emotion? Whereas financial management thrives upon a certain level of risk (Bird, 2009), disaster risk reduction decision-making deals with risk but on behalf of others. That occurs to the extent that denial of disastrous reality, or failure in its perception and decision making, could result in serious disaster-related consequences for many people—exactly as the financial tsunami did.

Programmes for disaster risk reduction frequently appear unaware of matters outside their perceived purview (e.g. EU Scenario, 2008) but which often have colossal implications for disaster losses. Land clearance, population displacement and migration, development on flood plains and along coastlines, buildings insecure against high winds and earthquakes, and the causes and reasons for these conditions, all need to be recognised as closely related matters for disaster risk reduction. The magnitude and extent of disasters is created in the contexts of these conditions, as is the magnitude and extent of demands upon post-disaster management.

Post-disaster reports often do not refer to these causative contexts, despite the discussion being well embedded in academic literature (e.g. Hewitt, 1983; Lewis, 1999; Oliver-Smith, 1986; Wisner et al., 2004). Were they to do so, the causes of disasters, as well as their management, would become accessible evidence upon which the reduction of future disasters could be based.

As described earlier, investigative reports are often required by law after many forms of major incidents such

as airplane crashes, industrial fires, and chemical leaks. In these, measures to avoid recurrence are identified. The same standard is not always applied to disasters that continue to be falsely assumed as being “natural”, with the implication that investigation of their causes would be presumptuous. Independent, comprehensive reports would invaluablely combine post-disaster investigations with pre-disaster contexts in which long- and short-term changes in physical and social development have influenced the disaster occurrence in question (e.g. Lewis, 1982, 1991). Reports would also examine the efficacy of crisis management and stresses upon managerial and individual decision making.

Rather than blame disasters on only external influences such as climate change, deities, or nature’s wrath, should matters such as social and economic change, as well as the realities, structures, values, comprehension, and decisions taken in disaster-related work, also be considered and appraised? Do case studies involving natural forces differ from those without any?

## Risk, fear and denial

Institutional identification of risk to others comprises perceptions by individuals of that risk and their consequent decision-making under various stresses. Literature searches suggest that risk management tends mainly to be concerned with collective responses to risk (e.g. Berry, 2004) and how individuals perceive and respond to risk (e.g. Fischhoff, 1995; Krinsky & Golding, 1992). Individual perception of risk to others may not have received the same attention. Despite solid literature providing a foundation in this topic (e.g. McIvor et al., 2009; Paton, 2007; Paton et al., 2008), there remains a need to study more about the practicalities of judgements made under stress—which sometimes differ from what individuals state they would hypothetically do in certain circumstances (e.g. see Sorenson’s, 2000 discussion regarding gaps).

For example, the “disaster psychology” literature focuses heavily on various contexts of disaster aftermaths, with the psychological precursors of disasters sometimes bypassed (although see e.g. McClure et al., 2009; McIvor & Paton, 2007; Paton et al., 2008). Responses by the public, or by sectors of the public, to risk-taking in general or to specific day-to-day risks (e.g. health, food, alcohol, smoking, and HIV/AIDS) are highlighted, but often with less emphasis on individual professionals assessing other individuals “at risk”. Without detracting from the importance of these studies which are insightful

and needed, administrative and emotional pressures upon individuals involved in decision making and consequent risk-taking on behalf of others, may be a priority for focusing future work. Ripley (2008) is an outstanding example of an exceptional study that does so, even if within a single cultural context, thereby setting an important research agenda.

Studies in the psychology of the individual preceded work in collective psychology, in which commonalities or averages of human behaviour became the basis for conclusions relevant to a group or sector. Some collective studies nonetheless concluded that human beings could not be generalised, such as Jung’s (1958) eminent conclusion “that the real picture consists of nothing but exceptions to the rule, and that, in consequence, absolute reality has predominantly the character of *irregularity*” (p. 9; Jung’s italics).

Jung (1958) was concerned to counter *knowledge* of collective statistical science, with *understanding* of the individual: “...the positive advantages of knowledge work specifically to the disadvantages of understanding... judged scientifically, the individual is nothing but a unit which repeats itself ad infinitum...For understanding, on the other hand, it is just the unique individual human being who, when stripped of all those conformities and regularities so dear to the heart of the scientist, is the supreme and only real object of investigation.” (Jung, 1958, p. 11).

Response to situations of risk may vary, therefore, according to individuals’ circumstances and experiences. Examples are genetics and emotions. As Le Doux (1998, p. 137) states “...genes make each of us different from one another and explain at least part of the variability in the way different people act in dangerous and other situations.” Genetic responses themselves may be influenced in innumerable ways by fundamental psychological phenomena which include emotions such as love, hate, anger, joy, shame, guilt, and fear (Gray, 1971) <sup>1</sup>. Any emotion may affect decision-making, but hazards, natural otherwise, may inevitably invoke fear to some degree.

Human susceptibility to the emotion of fear may, in part, be due to hereditary factors and early environment which, in each person, is unique. Fear might occur as a result of limited information; can induce protective passivity (Cohen, 2001); can overwhelm ability to

<sup>1</sup> “Even a casual analysis of the number of ways the concept of fear can be expressed in the English language reveals its importance in our lives: alarm, worry, concern, misgiving, qualm, disquiet, uneasiness, wariness, nervousness, jitteriness, apprehension, anxiety, trepidation, fright, dread, anguish, panic, terror, horror, consternation, distress, unnerved, distraught, threatened, defensive.” (Le Doux, 1998, p. 129).

perceive and to act; and can induce other emotions such as guilt, hope, relief and anger (Gray, 1971). Linked to anger and anxiety, fear can have direct negative influences upon behaviour (Adcock, 1960; Paton, 2003), but the reality of the threat or risk may be denied or disavowed. Conversely, low-level threats can lead to disaster preparedness (e.g. Crozier et al., 2006).

Denial protects from unpleasant reality by refusal to believe that reality. Disavowal tends to accept the significance of a fact or perception, simultaneously playing down that significance, or becomes a basis of blame for why the hazard is indeed “hazardous”. For denial to exist, the threat must first be perceived; inadequacy or failure of perception is myopia (Romero & Kemp, 2007; Jarvis, 2004). Studies of western society and culture that these and most other sources in this article represent, may not be directly applicable to other cultures (e.g. Paradise, 2006; Ryde, 2009).

Psychotic denial may seek scapegoats by acting out, indulging in deliberately wasteful behaviour by reaction, projecting anxiety onto some other unrelated but containable problem by displacement, the shutting out of information by suppression, or holding on to preconceptions in the face of new information as a version of cognitive dissonance (Festinger, 1962). These different forms of denial may not be recognised by the perpetrator (Marshall, 2001).

Cohen (2001, p. 4) notes that “Denial can be individual, personal, psychological and private – or shared, social, collective and organised”. Consequently, denial can be effected by groups and organisations as well as by individuals. Denial has been identified as a response to annihilations, massacres and other major human rights atrocities (Slovic, 2007). To overcome that denial is the objective of major international non-governmental organisations such as Amnesty International and Oxfam (Cohen, 2001).

Chichilnisky (2009a, p. 808) observes that “although they are rare, catastrophes play a special role in our decision making processes...(and that)...Neurologists believe that such events alter cognitive processes and the behaviour that could be otherwise expected.” She continues that the problem lies in the standard definition of rationality, which is narrow and based on testing whether or not we optimise “expected utility...(which)...underestimates our response to rare events....This insensitivity...creates an illusion of ‘irrational behaviour’ since what we anticipate does not agree with what we

observe.” (p. 808). The insensitivity of expected utility to rare events, she argues, and the attendant inability to explain responses to events that invoke fear, are the sources of many failures of rationality “that have been found over the years” (p. 808). Rational behaviour, she concludes, needs to be defined more broadly and more in tune with the way humans really behave. That will come to “a new understanding of rationality consistent with previously unexplained observations about decisions involving rare and catastrophic events, [and] decisions involving fear...” (p. 807).

## Application

It is a small step, therefore, to suggest that denial can apply to perception of risk from natural hazards. An example is a couple who saw the tsunami approaching their Thai beach on 26 December 2004 and took photos rather than trying to escape (BBC News, 2005), possibly because, if they realised what was happening, they denied that they were threatened by the ocean’s strange behaviour. This can also occur in disaster management individuals, departments or organisations.

Political denial is frequently recognisable. For example, referring to the ongoing depression during his inauguration speech of 4 March 1933, President Franklin D. Roosevelt asserted “...the only thing we have to fear is fear itself”. His intention was to overcome “nameless, unreasoning, unjustified terror which paralyses needed efforts to convert retreat into advance” (Guardian, 2007). It may also have been a desire not to appear responsible for unavoidable events, or denial of a reality in which there was indeed very much to be feared. Britain’s refusal to recognise the Armenian massacre of 1915, was not recognised as “genocide denial” until documents were disclosed in November 2009 (Leigh, 2009). The debate continues internationally. Only twenty years after the end of World War I, Prime Minister Chamberlain in September 1938 declared “peace for our time” when, within a year, World War II would commence. Then, in 1940, General (later Field Marshal) Rommel would estimate that “the war would be won in a fortnight” (Gilbert, 2009).

Examples abound from disasters other than war. Proposals were made for at least thirty years to implement an Indian Ocean tsunami warning system, but action was sidelined until the catastrophe of 26 December 2004 after which the Indian Ocean tsunami warning system was operational within 18 months (Kelman, 2006). The government of Florida, USA,

is ignoring the challenges that their coastline will experience due to sea-level rise in order to cater to developers and their short-term profits (Pilkey & Young, 2009). Denial also occurs due to priorities other than that of properly dealing with disasters. India clearly felt that developing nuclear weapons was more important than contributing to a tsunami warning system and is still reluctant to provide some real-time seismic data.

Whatever their context or cause, given that risk by social science definitions is subjective (Adams, 1995), it is clear that emotions must and do affect assessment of risk: "Although we may like to think that our judgements about risk are entirely objective... emotional responses (to events and situations)...could affect not only a person's judgement of risk...but also risk estimates for other types of hazards" (NSF, 2008, online). An examination of how emotions affect risk assessment found that participants exposed to fear held more pessimistic perceptions and were more risk-averse, while those exposed to anger were more risk-seeking (NSF, 2008). In this study, fear in some and anger in others were induced by the same experience and, although gender differences may have been significant, the resulting emotion depended upon the person.

A baseline for the topic has now been established, identifying some gaps in studies and indicating ways forward for closing the gaps. Next, more detailed vignettes are provided of comparative contexts in financial management, industrial disaster, social care, construction and climate change.

## Financial management

Numerous analyses of the 2008-09 "financial tsunami" that caused chaos in London's City, New York's Wall Street and beyond, indicate that, in lending institutions, "...Individuals are often driven more by their own interests in a given situation than by the collective good of the whole. The way that the city rewards its employees enforces this tendency...based on a modest annual salary and an annual bonus that may be a multiple of the salary depending on the organisation's results...The culture prevalent in the City does not tend to encourage excessive prudence" (Bird, 2009, p. 2). A City-pervasive short-term culture worked against its (and others') longer-term interests whereas individuals' short-term risk taking should be monitored for the interests of the organisation (and beyond) in the longer-term.

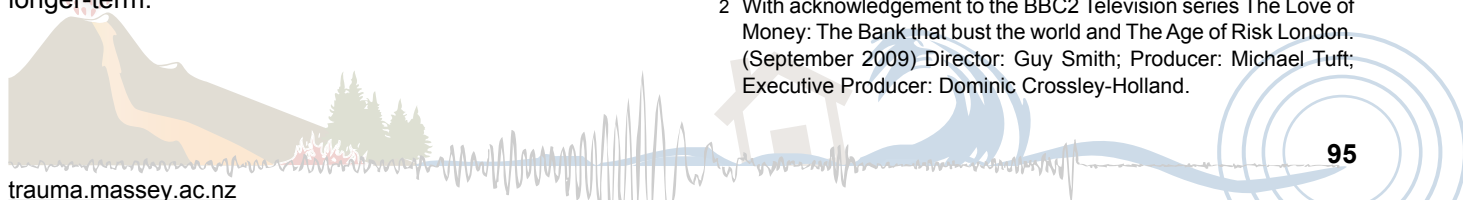
From the 1987 film *Wall Street*, 'Greed is good' became "Wall Street's unofficial motto of the 1980s" (Sorkin, 2009, online). Changed attitudes to financial risk and rapidly expanding financial "bubbles" characterised the boom years before the global crash. Some had warned against the risks, but financial regulation had been relaxed. Low interest rates made "cheap money" available for un-restricted, over-eager lending, by which domestic and commercial debt became common-place. Attitudes to risk changed and a "reckless love of money" by traders ensued, until a chain of events led to large companies collapsing, triggering a world recession of a scale not experienced since 1929. The collapsed company Lehman Brothers' own comment was: "We lost the fear"<sup>2</sup>; that is, the fear that had normally restricted the taking of excessive financial risks. Capitalism had become greed and short-term gain irrespective of long-term pain, losing its innate capacity for caution and self-protection over the long-term.

Fear of risk, of financial uncertainty and of loss of job security triggered behaviour that included a serious lack of reaction during the preceding three years, followed by an equally irrational "absolutely frantic" overreaction. Underlying day-to-day fundamentals were not changed in tune with what was happening in unusually volatile markets. Irrational exuberance as greed, and irrational pessimism as fear, both played their part. Do fear and greed govern the efficiency of The City (Kollewe, 2008)? Fear is rational, but behavioural response to it might not be.

Comprehension of what was happening was obscured, even for financial managers, by the drawing on terminology not in daily use, a form of "denial by obfuscation" not unique to the financial world. "Credit default swaps", "structured investment vehicles", "collateralized debt obligations" and "securitised subprime mortgages" facilitated a passing on of risk that became unidentifiable and "proved far riskier than anticipated" (Anderson, 2009, online). One year later, bankers are reported to be concocting new, similarly unintelligible products such as "life settlements" and "re-remics", signalling a return to "chasing profits with complicated new products" (Anderson, 2009, online) for which others might use simpler terms of "hope, greed and fear" (Wharton, 2009, online).

An assessment of psychological factors in the crisis of confidence that heralded financial collapse noted the

<sup>2</sup> With acknowledgement to the BBC2 Television series *The Love of Money: The Bank that bust the world and The Age of Risk London*. (September 2009) Director: Guy Smith; Producer: Michael Tuft; Executive Producer: Dominic Crossley-Holland.



“mania and over-optimism behind the housing bubble, a lack of self-control by consumers hooked on debt, and the shock and feeling of betrayal...(of those)... who thought they were making safe investments, but now find themselves facing an uncertain future...suffer ‘disaster myopia’ either because they can’t imagine a downturn happening, or they assume the probability of it happening is so low that it isn’t worth worrying about...Myopia may be wilful in that we don’t want to contemplate undesired outcomes” (Wharton, 2009, online). Thus, there is arrogance and over-optimism on the one hand, fear on the other, and myopia in between.

## Industrial fire

“Summerland” was a leisure centre developed by the city corporation of Douglas, the largest town on and capital of the Isle of Man, UK. At the start of the fire that killed 53 people and destroyed the centre in August, 1973:

the staff failed to call the fire brigade promptly, and the elaborate fire-alarm system was not used at all, one of the first warnings of the fire being given by a ship at sea which spotted the blaze on shore. This pattern is not limited to Summerland...(in a)...study of 1,200 fires, one sixth...had become large because of a failure to summon the fire brigade...questions are raised about whether such behaviour occurs because of a fear of sounding an unnecessary alarm, or because of a persistence of the syndrome of denial of danger, a persistence which Wolfenstein (1957) suggests becomes more pathological the nearer the danger looms (Turner, 1978, p. 74).

The official report of the fire differentiated between the issues that presented themselves as the disaster unfolded and those that were revealed in investigation afterwards. As noted, “All of these recommendations (made in a number of accident reports), diverse though they may be, have in common...that they are concerned to deal with the problem which caused the disaster as it is now revealed, and not to deal with the problem as it presented itself to those involved in it before the disaster” (Turner, 1978, p. 74). As one report of a significant fire commented: “It would be unjust not to acknowledge that not every failure which is obvious now would be obvious before the disaster put the structure and the people to the test” (Summerland Fire Commission, 1974).

Should it take 35 years after the event to observe, of a fire that grew larger because numerous people failed to

act, that “to deal with the problem as it presented itself to those involved” had, in reality, been the crucial issue?

Less than a year after the Summerland fire, at Flixborough, near Scunthorpe, UK, 70 people were working on the site of the Nypro chemical plant at the time of the explosion and fire on 1 June 1974. Of those, 28 were killed and the industrial plant was destroyed. Advised procedure in the event of an incident had been for all employees to report to the central control room on the site. Yet all of those who died were in the control room. All of those who survived had headed for the site perimeter, though there were few exits (Westgate, 1975).

Reports of these two cases suggest a failure of authorities to comprehend the potential extremity of “accidents” and limited perception of the serious possibility of “total wipe-out”. Subsequent cases, such as the 1988 Piper Alpha North Sea gas platform explosion or the 2005 Buncefield oil storage explosion will have done little to change this view. Post-disaster reports only sometimes provide explanations or identify preventive measures, failing in many cases to tell everything we need to know (Kletz, 2009). That is despite a wide literature on how to train organisations for disaster-related decision-making (e.g. Paton and Jackson, 2002) that could be applied in practice so that people involved do understand what they need to know and how to ensure that they glean that knowledge.

## Social care: crime by and against children

In the London borough of Haringey in 2007, an 18-month-old boy died from injuries inflicted by his parents and a lodger. Before he was one year old, a head injury and other bruises had been found on the boy and the mother was arrested. Due to physical abuse and neglect, the boy was placed on the child protection register, but he continued to suffer injury and bruising which a hospital doctor failed to examine. The boy died shortly afterwards (Batty, 2009) of his wounds being: “...more than 22 injuries on his body, a fingernail and toenail were missing, having been ripped out in some form of torture, his earlobe was torn and his spine had been fractured by being hyper-extended over his cot or someone’s knee” (Laville, 2009, online). The boy’s mother was jailed indefinitely, her partner was jailed for life and the lodger was given an indeterminate sentence for public protection (Batty, 2009).



Near Doncaster in Yorkshire, in 2009, two brothers aged 10 and 11 at the time “beat, burnt, stabbed, sexually abused and almost killed” (Murray, 2009, online) an 11-year-old boy and his younger nephew. The two accused were both victims and perpetrators of horrific child abuse. The brothers had been raised in circumstances of violence, drugs and neglect, and had been known to the police and to child protection services for some years. The 10-year-old was on police bail and the 11-year-old had been in court four times previously for “acts of violence”. Together, they were infamous for their antisocial behaviour in the community. Social workers were criticised for failing to intervene earlier in the boys’ dysfunctional family (McVeigh, 2009).

Could the backgrounds of poverty and sexual abuse, that characterised each of these two cases of extreme cruelty, have been perceived as warnings of extreme consequences? Possibly. First, only a minority of people who are poor and/or who have been abused end up being abusers. Second, because social services are notoriously under-funded around the world, does this reflect poor understanding of the role of social services? It may not be possible to monitor or intervene in all cases, especially given the long shifts, low salaries and consequent fatigue that many social and health service personnel suffer. Yet given the family histories, social background, sequence of injuries, the placing of the Haringey boy on the “at risk” register and the reportedly 60 home visits by social workers, doctors and police during the final eight months of his life (Doward and Slater, 2009), how could it have been that the extremity of risk in which he was living, and the consequences that led to his death, were not foreseen?

Did fear from lack of experience and of disrupting an established decision making process become a trigger of denial and the reason why perception of potential extremes appears to have been so limited? Would action have exacerbated an already onerous work-load? Is it realistic to assume that years of tertiary education and training will produce social workers, or any other decision maker, sufficiently able to anticipate extreme behaviour and to recognise and act on the potential for such extremes, within their system’s constraints? Social workers are amongst the professionals who are exercised in repeatedly stressful contexts requiring critical decisions directly impacting upon individuals and families at risk. In any profession, assessment of people’s circumstances requires judgement based upon experience perhaps not yet acquired by young

professionals. Can it be relied upon from managers, especially those who have long been removed from field visits? The official reports of these and other serious cases have been published (e.g. Laming Report, 2009).

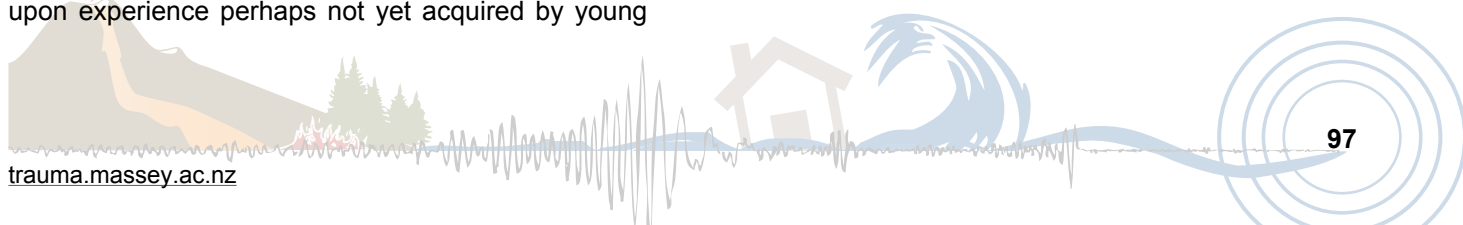
## Construction

That all users would otherwise be at risk from failure of bridges, buildings and other structures is the reason why efforts are applied for all construction to be rigorously and tightly regulated and controlled. Within its regulations, continual pursuit of greater achievement and efficiency, such as in improved earthquake resistance (e.g. Hikone et al., 2009), means advances in structural design based on failures and disasters involving workers and subsequent users. Histories of structural failures have become the foundation upon which subsequent regulations have been formulated. For instance, building codes involving seismic measures were first put into effect in Los Angeles, New Zealand, Japan, and Jamaica after these locations suffered earthquake damage, respectively in 1933, 1931, 1923, and 1907 (e.g. Levy & Salvadori, 1995).

As in other management sectors, failures expose human as well as structural shortcomings. For example, hubris and carelessness in over-optimistic design were exposed by the 1879 collapse of the Tay River Bridge in Scotland that, on its completion in 1878, was the world’s longest bridge (Lewis & Reynolds, 2002).

Optimism and controlled success in construction can be reversed by corruption in construction practice (Ambraseys & Bilham, 2011; Lewis, 2008b) and corruption itself elicits emotions of disgust, contempt and anger (Solberg et al., 2010). Greed and exploitation cause bribes to avoid regulations and inspections, consequent failure of inadequate construction under hazard-induced loading, and development on inappropriate land. Construction examples, such as from earthquakes and floods, are prime cases of the creation of vulnerability, the making of disasters that wait to happen on behalf of greed and denial of consequences or consideration for those who become its victims.

Innumerable official reports have followed construction failures (e.g. Aini et al., 2005; Loughborough University & UMIST, 2003; HSE, 1999). Risk might receive due consideration in such reports, but it is rare to find in-depth discussion of fear or denial.



## Climate change

The number of degrees that temperatures will change and the number of centimetres that seas will rise are the basis for most descriptions of climate change. Some descriptions enlarge upon the consequential collective hazards that will develop, whether accurate or not (e.g. Yamin et al., 2005), or on the global nature of their potential experiential reality (e.g. Vörösmarty et al., 2000). Other reports of meteorological disasters often give climate change as their context, cause, or excuse (e.g. Holmes, 2009).

Information for limiting carbon emissions or for increasing carbon sinks, in order to slow the rate of climate change, is now frequently and widely available. So far, this information has had little effect towards necessarily radical changes to affluent living standards and lifestyles (e.g. Lewis, 2009). Meanwhile “lifestyles” of poverty have no option but to suffer further degradation.

An inherent and pervasive political denial of the reality of climate change goes beyond politicians’ perennial excuse of public alarm and “panic”, and has become consistent opinion (e.g. Marshall, 2001). As the impact of climate change and its warnings intensify (e.g. Stott, 2010), individual and collective denial increases (Lorenzoni & Pidgeon, 2006) to the extent that, we are told: “...there is no leeway for delay or denial any longer.” (Pachauri, 2010, online).

Information on climate-related hazards is hard to find in the *United Kingdom Climate Projection* (DEFRA, 2010). To learn from it about potential coastal flooding, for example, would take considerable time, patience, effort and intuition. Information is shrouded in probabilities, cautions and caveats regarding their interpretation: “Probabilistic climate projections are based on subjective probability, as the probabilities are a measure of the degree to which a particular level of future climate change is consistent with the evidence considered...the evidence comes from historical climate observations, expert judgement and results of considering the outputs from a number of climate models, all with their associated uncertainties.” (DEFRA, 2010, online).

This “denial by obfuscation” deters sensible interpretation, understanding and decision making and does little to overcome the psychological reality in which “people can accept the truth of what is said without accepting the implications” (Marshall, 2001). Knowledge is not enough, even where it can be found, and denial cannot simply be countered with information; indeed, increased

information may serve to intensify the denial (e.g. Weingart et al., 2000).

Hazards are not a comfortable topic. It is more amenable to implement measures envisaged for a more acceptable future than it is to take action against fearful hazards, whether of the present or the future (Lewis, 2007). Could denial be at the root of current lassitude to comprehensive approaches to deal with climate change? Why else do great divides persist between specialist findings and policy implementation?

In the UK housing sector, the carbon-free house (Building Research Establishment, 2010) exists side-by-side with legal housing development on flood-prone sites (Lewis & Kelman, 2009) and failures of recent construction in moderately high winds. In the UK energy sector, new nuclear power stations with a life expectancy of 60 years, are proposed for UK sites vulnerable to rising seas and storm surges (Blowers, 2009). In the over 25 years since sea-level rise became a concern (e.g. EPA, 1983), there has been adequate time for multi-disciplinary, multi-sectoral and multi-temporal policies to have been formed and implemented, yet century-scale sea-level rise is still frequently seen as an afterthought (e.g. Pilkey & Young, 2009).

The regrettable but persistent split between the two camps of “disasters” and “development” (Lewis, 1999, 2007) has to be overcome as part of fully encompassing climate change as a subset of disaster risk reduction (Mercer, 2010). Consideration of coastline vulnerabilities by Australia (Walsh et al., 2004) and the United Kingdom (POST, 2009) are overdue signs of improvement.

## A supplementary view

Explorations into the five sectors of financial management, industrial fire, social care, construction and climate change, indicate that there is indeed much more to be feared than fear itself. Human behaviour is affected by emotions, many of which are triggered by fear. This exploration does little to change aspects of disaster theory as described; in fact, it could be that technocracy applies to itself. This exploration does acknowledge that, while strategies to reduce social and economic vulnerabilities remain poorly implemented, decision makers are themselves psychologically vulnerable in ways that may be unexpected and that may be exacerbated by perceptions of, or confrontations with, risk and fear. This paper shows that it would be advantageous if behavioural consequences, such as

denial, were to be regarded by those working with disasters *not* as an infrequent or unusual condition but as a normal aspect of human behaviour and response, thus facilitating permanent remedial strategies (Cohen, 2001) in management training and development of professionals tackling disasters across disciplines (i.e. not just psychologists, many of whom already recognise this point).

Within that context of the training and development of professionals tackling disasters, the psychology of the individual is introduced by Hewitt (1983) in a quotation from Bertolt Brecht: "We only dimly realise how dependent we are in every way in all our decisions... It's only much later that normal everyday life turns out to have become abnormal in a way that affects us all. Something has been forgotten, something has gone wrong...*It's because people know so little about themselves that our knowledge of nature is so little use to them*" (Brecht, 1965 in Hewitt, 1983, p. 26). Hewitt concludes that there is the need for reinterpretation through "examination of the psychological underpinnings of thought, assumption and practice" (p. 4). That plea has not yet been fully met by the research community.

In the organisation and management of resources, technocracy is inclusive of decision making which, like all human functions, is subject to the behavioural consequences of emotions. It is part of the technocratic approach to natural hazards that behavioural fluctuations and inconsistencies in response to emotions are a component of dealing with disasters. Acceptance of the high probability of psychological influences in perception and decision making should become the norm. Studies of the conditioning fear abound (e.g. Paton, 2003; Schiller et al., 2010) with attempts at conditioning regarding fear implemented in the training of, for example, firefighters, astronauts, humanitarian workers, and military personnel. While success varies (McFarlane, 2004), wider acceptance of, and instruction regarding, the psychological aspects of fear and denial in the context of disasters might imbue a deeper and longer-term understanding of the need to acknowledge, confront and work with human fear as part of tackling vulnerability.

This view does little to counter the technocratic dominant view, as articulated by Hewitt (1983), or to support the proposed changes in human-environment relations in order to seek the fundamental "ingredient" in disasters—vulnerability. It could be regarded as a supplementary view or, if preferred, as a compromise which suggests

that the consequences of the technocratic view are now too entrenched for radical change. This occurs despite scattered examples where radical change is witnessed, such as community-based teams setting out to reduce vulnerability prior to a disaster striking (e.g. Ogawa et al., 2005; Maceda et al., 2009; Paton et al., 2010). Within its *status quo*, however, there is a need for further understanding, acceptance and adjustment, a strong candidate for which is the probability of behavioural inconsistencies in management. Such inconsistencies might have impeded strong action for vulnerability reduction by failing to accept the vulnerability core of disaster creation.

Applications of Jung's (1958) concern to counter *knowledge* of collective statistical science, with *understanding* of the individual, could be timely. An apparent jumble of human emotions is easier to disregard than to acknowledge, understand and incorporate. Instead, formulaic and narrow "box-ticking" is quicker, more easily comprehended and more ordered. What may be required is managerial comprehension of multiple approaches for consolidation and application in the context of realities likely to be more jumbled than formulaic.

A difficulty might be that instinctive emotional forces unconsciously exert their effect on psychological functioning, variations of perception, and corresponding human reaction. Emotions, therefore, do affect our assessments of, or cause our denial of, vulnerability and risk. Our behavioural responses have the capacity to modify or to nullify the application of measures for disaster management and risk reduction, often in a manner that seems surprising to many, as evidenced by references throughout this paper. Acceptance of this reality is imperative and long overdue, potentially forming a strong foundation for focusing on vulnerability reduction.

Within the dividing off of disasters from human-environment relations, is the further dividing off of vulnerability analysis from those sectors responsible for its creation. For "vulnerable" to be a term that "may be taken as derogatory when applied to people, especially if the term is misunderstood" might itself indicate denial leading to "understanding of 'vulnerability'...being restricted by constraints of distaste, but unpleasantness, where it exists, should not become a barrier to understanding and resolving insidious and invidious activities and processes" (Lewis & Kelman, 2010, pp. 192-193).

Organisational technocracy repeatedly fails by its separation of “disaster management” and disaster risk reduction from other sectors and by failing to understand that vulnerability creation is a process, not an event. Furthermore, it is not the prerogative of one specialist sector separated from all other activities; it is an inherent risk for all sectors. Not only are organisational aspects of technocracy in question, but also its physical and technical applications are repeatedly exposed as structural flood walls collapse or are overtopped, as major industrial catastrophes continue, and as reinforced concrete construction so frequently fails in earthquakes.

## Conclusions

Focusing on the interactions and feedbacks amongst fear, denial, and vulnerability would help to overcome the challenges. Significant attention is given by many sectors to post-disaster reporting, yet the reporting mechanisms are inconsistent, especially frequently underplaying the vulnerability causes of disaster. In particular, reports on disasters involving natural hazards could better emulate many reports from disasters without natural hazards in investigating decision-making processes and the role that psychological factors such as fear and denial played in the long-term and short-term run-up to the catastrophe.

Reports should not simply catalogue damage, deaths, and estimated reconstruction costs, or be lists of post-disaster donors, though these statistics are helpful. Widely comprehensive reports would reveal not only what has been affected but also give analytical *reasons why*, particularly highlighting why the vulnerability existed and why others' appraisals of risk were formulated in certain manners. In this way, reports would become a foundation for social, economic and political adjustments by which vulnerabilities could begin to be reduced as a result of our increased understanding.

Post-disaster publication of independent, comprehensive and analytical reports of all forms of disaster would be invaluable aids to management reassessments, collective memory, and understanding of the processes of vulnerability. Investigations would need to include (i) both the wider contexts of long- and short-term changes in physical and social developments that could have influenced the magnitude and extent of the disaster and (ii) analyses of the performance of disaster management before, during and after disaster occurrence. For both points, the aim should be to consider emotions and

personal attributes concerning fear and denial as part of the systemic vulnerability that led to the disaster.

Nevertheless, although post-disaster reports may come to identify failures of perception, just having reports may do little to assuage pre-disaster denial of imminent catastrophe. Researchers need to engage with practitioners to apply the lessons learned before disaster strikes. Otherwise, the disaster problem will persist until appropriate measures prevail for the realistic perception of risk and vulnerability to others.

## References

- Adams, J. (1995). *Risk*. London: UCL Press.
- Adcock, C. J. (1960). *Fundamentals of Psychology*. Baltimore: Penguin.
- Aini, M. S., Fakhru'l-Razi, A., Daud, M., Adam, N. M., & Abdul Kadir, R. (2005). Analysis of Royal Inquiry Report on the collapse of a building in Kuala Lumpur: Implications for developing countries. *Disaster Prevention and Management*, 14(1), pp. 55-79.
- Ambraseys, N. & Bilham, R. (2011). Corruption kills. *Nature*, 469: 153-155.
- Anderson, J. (2009). Wall Street Pursues Profit in Bundles of Life Insurance, *New York Times*, 5 September. Retrieved 31 January 2010, <http://www.nytimes.com/2009/09/06/business/06insurance.html>
- Barredo, J. I. (2009). Normalised flood losses in Europe: 1970–2006. *Natural Hazards and Earth Systems Sciences*, 9, 97-104.
- Batty, D. (2009). Timeline: Baby P case, *The Guardian*, 11 August. Retrieved 13 September 2009, <http://www.guardian.co.uk/society/2009/may/22/baby-p-timeline>
- BBC News (2005). In pictures: Tsunami couple's last moments, *BBC News Online*, 24 February. Retrieved 4 January 2010, [http://news.bbc.co.uk/2/hi/in\\_pictures/4293123.stm](http://news.bbc.co.uk/2/hi/in_pictures/4293123.stm)
- Berry, D. (2004). *Risk, Communication and Health Psychology*. Maidenhead: Open University Press.
- Bird, P. (2009). The Root of the Problem, *IRM FOCUS – Papers on Risk: Risk and the Financial Crisis, Summer*, pp. 1-2.
- Blowers, A. (2009). No Burying this nuclear dilemma, *The Guardian: Letters*, 26 October. Retrieved 26 October 2009 <http://www.guardian.co.uk/environment/2009/oct/26/nuclear-waste-carbon-cutting>
- Brecht, B. (1965). *The Messingkauf dialogues* (as quoted in Hewitt, 1983).
- Building Research Establishment (2010). The UK's first net zero carbon home. *World Architecture News*. Retrieved 15 January 2010 [http://www.worldarchitecturenews.com/index.php?fuseaction=wanappln.projectview&upload\\_id=1658](http://www.worldarchitecturenews.com/index.php?fuseaction=wanappln.projectview&upload_id=1658)
- Bye, P. & Horner, M. (1998). *Easter Floods 1998: A Preliminary Assessment by the Independent Review Team*, Report to the Board of the Environment Agency. London: Environment Agency.
- Chapman, A. (2009). CAMPARI on the rocks. *IRM FOCUS – Papers on Risk: Risk and the Financial Crisis, Summer*, pp. 3-4.

- Chemtob, C. M., Nakashima, J. P., & Hamada, R. S. (2002). Psychosocial Intervention for Postdisaster Trauma Symptoms in Elementary School Children: A Controlled Community Field Study. *Archives of Pediatrics and Adolescent Medicine*. 156, pp. 211-216.
- Chichilnisky, G. (2009a). The topology of fear. *Journal of Mathematical Economics*. 45, pp. 807-816.
- Chichilnisky, G. (2009b). Catastrophic Risks. *International Journal of Green Economics*. 3(2), pp. 130-141.
- CIWEM (2009). *Joint Policy Statement on Managing Urban Flood Risk*. London: Chartered Institution of Water and Environmental Management.
- Cohen, S. (2001). *States of Denial: Knowing about atrocities and suffering*. Cambridge: Polity Press.
- Crozier, M., McClure, J., Vercoe, J., & Wilson, M. (2006). The effects of hazard zone information on judgements about earthquake damage. *Area*. 38(2), pp. 143-152.
- Damasio, A. (1994). *Descartes' Error: Emotion reason and the Human Brain*. London: Vintage.
- DEFRA (2010). *UK Climate Projections*. London: DEFRA (Department for Environment, Food and Rural Affairs). Retrieved 20 January 2011, <http://ukclimateprojections.defra.gov.uk/content/view/1118/690>
- Doward, J. & Slater, C. (2009). Baby P' warnings still ignored. *The Observer*, 2 August. Retrieved 13 September 2009 <http://www.guardian.co.uk/society/2009/aug/02/baby-p-child-abuse>
- EA (2001). *Lessons Learned: Autumn 2000 Floods*. London: EA (Environment Agency).
- EPA (1983). *Predicting Future Sea Level Rise: Methodology, Estimates to the Year 2100, & Research Needs*. EPA 230-09-007 Revised. Washington, D.C.: EPA (United States Environmental Protection Agency), Office of Policy and Resource Management.
- Etkin, D. (1999). Risk Transference and Related Trends: Driving Forces Towards More Mega-Disasters. *Environmental Hazards*. 1, pp. 69-75.
- EU Scenario Project (2007). *Terminology document*. Retrieved 27 February 2008, <http://www.scenarioproject.eu/?q=node/16>
- Festinger, L. (1962). *A Theory of Cognitive Dissonance*. Stanford: Stanford University Press.
- Fischhoff, B. (1995). Risk Perception and Communication Unplugged: Twenty Years of Process. *Risk Analysis*. 15(2), pp. 137-145.
- Fordham, M. (1999). Participatory planning for flood mitigation: models and approaches. *Australian Journal of Emergency Management*. 13(4), pp. 27-34.
- Gaillard, JC, Wisner, B., Benouar, D., Cannon, T., Creton-Cazanave, L., Dekens, J., Fordham, M., Gilbert, C., Hewitt, K., Kelman, I., Lavell, A., Morin, J., N'Diaye, A., O'Keefe, P., Oliver-Smith, A., Quesada, C., Revet, S., Sudmeier-Rieux, K., Texier P., & Vallette, C. (2010). Alternatives pour une réduction durable des risques de catastrophe (Alternatives for sustainable disaster risk reduction). *Human Geography: A New Radical Journal*. 3(1), pp. 66-88.
- Gilbert, M. (2009). *The Second World War: A Complete History*. London: Orion Books.
- Gray, J. (1971). *The Psychology of Fear and Stress*. London: Weidenfield & Nicholson.
- Guardian (2007). The only thing we have to fear is fear itself. Great speeches of the 20th century (full text and audio). Retrieved 23 March 2010, <http://www.guardian.co.uk/theguardian/2007/apr/25/greatspeeches>
- Hewitt, K. (1983). The idea of calamity in a technocratic age. In K. Hewitt (Ed.), *Interpretations of Calamity*. London: George Allen & Unwin, pp. 3-32.
- Hikone, S., Kanada, M., Kidokoro, R., Minami, M., & Shibata, I. (2009). Design in an earthquake zone. *Arup Journal*. 2009(2), pp. 34-58.
- Hodgkinson, P. E. & Stewart, M. (1998). *Coping With Catastrophe: A Handbook of Post-disaster Psychological Aftercare*. London: Routledge.
- Holmes, J. (2009). Climate change worsening disasters, says UN IRIN, Humanitarian news and analysis. Geneva: UN Office for the Coordination of Humanitarian Affairs. Retrieved 17 October 2009 <http://www.irinnews.org/Report.aspx?ReportId=86617>
- HSE (1999). *Collapse of a three storey building; A report on the accident at Woodthorpe Road, Ashford, Middlesex that occurred on 1 August 1995*. London: Health & Safety Executive.
- IPCC (2007). *IPCC Fourth Assessment Report*, Geneva: IPCC (Intergovernmental Panel on Climate Change).
- Jarvis, M. (2004). *Psychodynamic Psychology: Classical theory and contemporary research*. London: Thomson Learning.
- Jung, C.G. (1958). *The Undiscovered Self* (Translated from the German by Hull, R.F.C.), ninth impression, 1982. London: Routledge & Kegan Paul.
- Kelman, I. (2006). Warning for the 26 December 2004 Tsunamis. *Disaster Prevention and Management*. 15(1), pp. 178-189.
- Kletz, T.A. (2009). Accident reports may not tell us everything we need to know. *Journal of Loss Prevention in the Process Industries*. 22(6), pp. 753-756.
- Kollewe, J. (2008). Fear is the new mindset in the irrational world of finance. *The Guardian*, 23 October. Retrieved 21 September 2009, <http://www.guardian.co.uk/business/2008/oct/23/recession-market-turmoil-psychology-stress>
- Krimsky, S. & Golding, D. (Eds.) (1992). *Social Theories of Risk*. Santa Barbara: Praeger.
- Laming Report (2009). *The Protection of Children in England: A Progress Report*. London: The Stationery Office.
- Laville, S. (2009). Tracy Connelly: the story of a woman defined by abuse. *The Guardian*, 11 August. Retrieved 27 September 2009, <http://www.guardian.co.uk/society/2009/aug/11/tracy-connelly-baby-p-mother>
- Le Doux, J. (1998). *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*. New York: Phoenix.
- Leigh, D. (2009). Britain accused of genocide denial over Armenia. *The Guardian*, 4 November. Retrieved 7 November 2009, <http://www.guardian.co.uk/world/2009/nov/03/armenia-genocide-denial-britain>
- Levy, M. & Salvadori, M. (1995). *Why the Earth Quakes: The Story of Earthquakes and Volcanoes*. U.S.A.: W.W. Norton & Company.
- Lewis, J. (1982). *A Three-part Proposal. Three stages for natural disaster mitigation strategy: Integrated with socio-economic development at national, provincial and local levels*. Marshfield: Datum International.
- Lewis, J. (1991). Recommendations in *Economic development planning for recurrent natural disasters: Floods and*

- cyclones in Bangladesh. Report of a preliminary fact finding mission with recommendations*, for the United Nations Conference on Trade and Development, Marshfield: Datum International, pp. 34-42.
- Lewis, J. (1999). *Development in Disaster-prone Places: Studies in Vulnerability*. London: IT Publications (Practical Action).
- Lewis, J. (2007). Climate and disaster reduction. *Tiempo Climate Newswatch*. Retrieved 19 December 2009, <http://www.tiempocyberclimate.org/newswatch/comment070217.htm>
- Lewis, J. (2008a). *The Creation of Cultures of Risk: Political and commercial decisions as causes of vulnerability for others: An Anthology*. Retrieved 24 January 2010, <http://www.islandvulnerability.org/docs/lewis2008risk.pdf>
- Lewis, J. (2008b). The Worm in the Bud: Corruption, construction and catastrophe. In L. Boshier (Ed.), *Hazards and the Built Environment*. London: Taylor and Francis, pp. 238-262.
- Lewis, J. (2009). *Conserving the past at the cost of the future? Self sufficiency and sustainability in Marshfield, South Gloucestershire*. Retrieved 13 October 2009, <http://datum.gn.apc.org/sustainability.html>
- Lewis, J. & Kelman, I. (2009). Housing, Flooding and Risk-Ecology: Thames Estuary South-Shoreland and North Kent. *Journal of Architectural and Planning Research*. 26(1), pp. 14-29.
- Lewis, J. & Kelman, I. (2010). Places, people and perpetuity: Community capacities in ecologies of catastrophe ACME *An International E-Journal for Critical Geographies*. 9(2), pp. 191-220.
- Lewis, P.M.R. & Reynolds, K. (2002). Forensic engineering: a reappraisal of the Tay Bridge disaster. *Interdisciplinary Science Reviews*. 27(4), pp. 287-298.
- Lorenzoni, I. & Pidgeon, N.F. (2006). Public Views on Climate Change: European and USA Perspectives. *Climatic Change*. 77, pp. 73-95.
- Loughborough University & UMIST (2003). *Causal factors in construction accidents*. HSE research report 156, London: Health and Safety Executive.
- Maceda, E., Gaillard, J.C., Stasiak, E., Le Masson, V., and Le Berre, I. (2009). Experimental use of participatory 3-dimensional models in island community-based disaster risk management. *Shima: The International Journal of Research into Island Culture*, 3(1), pp. 46-58.
- Marshall, G. (2001). The Psychology of Denial: Our failure to act against climate change, *The Ecologist*, 22 September. Retrieved 12 October 2009, <http://ecoglobe.ch/motivation/e/clim2922.htm>
- Mason, B. G., Pyle, D. M., Dade, W. B., & Jupp, T. (2004). Seasonality of volcanic eruptions. *Journal of Geophysical Research*. 109, pp. B04206.1 - B04206.12.
- McClure, J., White, J., & Sibley, C. B. (2009). Framing effects on preparation intentions: distinguishing actions and outcomes. *Disaster Prevention and Management*, 18(2), pp. 187-199.
- McFarlane, C. A. (2004). Risks Associated with the Psychological Adjustment of Humanitarian Aid Workers, *The Australasian Journal of Disaster and Trauma Studies*, 2004-1. Retrieved 23 October 2009, <http://www.massey.ac.nz/~trauma/issues/2004-1/mcfarlane.htm>
- McIvor, D. & Paton, D. (2007). Preparing for natural hazards: normative and attitudinal influences. *Disaster Prevention and Management*. 16(1), pp. 79-88.
- McIvor, D., Paton, D., & Johnston, D. (2009). Modelling Community Preparation for Natural Hazards: Understanding Hazard Cognitions. *Journal of Pacific Rim Psychology*. 3(2), pp. 39-46.
- McKie, R. (2009). Climate change: melting ice will trigger wave of natural disasters, *The Observer*, 6 September, p. 20.
- McViegh, T. (2009). After Doncaster, how do we deal with damaged, abused youngsters?, *The Observer*, 6 September. Retrieved 17 February 2010, <http://www.guardian.co.uk/society/2009/sep/06/edlington-attack-children-social-workers>
- Mercer, J. (2010). Disaster Risk Reduction or Climate Change Adaptation .... are we reinventing the wheel? *Journal of International Development*. 2(2), pp. 247-264.
- Morris, S. (2008). Storms and Torrential Rain Take their Toll, *The Guardian*, 16 January. Retrieved 31 October 2009, <http://www.guardian.co.uk/weather/2008/jan/16/pollution>
- Murray, J. (2009). Children need more from us than just giving them rights. *The Observer*, 6 September. Retrieved 31 October 2009, <http://www.guardian.co.uk/commentisfree/2009/sep/06/jenni-murray-childrens-rights-protection>
- NSF (2008). *Assessing risk perception, Disasters: A special report. NSF and 9/11*. Washington, D.C.: NSF.
- Ogawa, Y., Fernandez, A. L., & Yoshimura, T. (2005). Town watching as a Tool for Citizen Participation in Developing Countries: Applications in Disaster Training. *International Journal of Mass Emergencies and Disasters*. 23(2), pp. 5-36.
- O'Keefe, P., Westgate, K., & Wisner, B. (1976). Taking the naturalness out of natural disasters. *Nature*, 260, pp. 566-567.
- Oliver-Smith, A. (1986). *The Martyred City: Death and Rebirth in the Andes*. Albuquerque: University of New Mexico Press.
- Pachauri, R. (2010). Climate change has no time for delay or denial, *The Guardian*, 4 January. Retrieved 15 January 2010, <http://www.guardian.co.uk/environment/cif-green/2010/jan/04/climate-change-delay-denial>
- Paradise, T. R. (2006). Seismic risk perception in a Muslim Community: a case study from Agadir, Morocco. *Journal of North African Studies*. 1(3), pp. 243-262.
- Paton, D. (2003). Disaster preparedness: a social-cognitive perspective. *Disaster Prevention and Management*. 12(3), pp. 210-216.
- Paton, D. (2007). Preparing for natural hazards: The role of community trust, *Disaster Prevention and Management*. 16(3), pp. 370-379.
- Paton, D., Burgelt, P. T., & Prior, T. (2008). Living with Bushfire Risk: Social and environmental influences on preparedness. *The Australian Journal of Emergency Management*. 23(3), pp. 41-48.
- Paton, D., Frandsen, M., & Johnston, D. (2010). Confronting an unfamiliar hazard: Tsunami preparedness in Tasmania. *The Australian Journal of Emergency Management*. 25(4), pp. 31-37.
- Paton, D. & Jackson, D. (2002). Developing disaster management capability: an assessment centre approach. *Disaster Prevention and Management*. 11(2), pp. 115-122.
- Pearce, F. (2002). European Floods Linked to Poor Land Management. *New Scientist*, 21 August. Retrieved 4 January 2008, <http://www.newscientist.com/article/dn2696>

- Pilkey, O. & Young, R. (2009). *The Rising Sea*. Washington, D.C.: Island Press.
- Pitt, M. (2008). *Learning lessons from the 2007 floods: The Pitt Review*. London: UK Cabinet Office.
- POST (2009). *Coastal Management*. POSTNote 342, London: POST (Parliamentary Office of Science and Technology).
- Ripley, A. (2008). *The Unthinkable: Who Survives When Disaster Strikes - and Why*. New York: Crown Publishers.
- Romero, A. & Kemp, S. M. (2007). *Psychology Demystified*. New York: McGraw-Hill.
- Ryde, J. (2009). *Being White in the Helping Professions: Developing Effective Intercultural Awareness*. London: Jessica Kingsley.
- Schiller, D., Monfils, M.-H., Raio, C. M., Johnson, D. C., LeDoux, J. E., & Phelps, E. A. (2010). Preventing the return of fear in humans using reconsolidation update mechanisms. *Nature*. 463, pp. 49-53.
- Schmidt, M. & Dehn, M. (2006). Examining Links Between Climate Change and Landslide Activity Using GCMs: case studies from Italy and New Zealand. In S. J. McLaren & D. R. Kniveton (Eds.), *Advances in Global Change Research: Linking Climate Change to Land Surface Change*. Netherlands: Springer, pp. 123-141.
- Slovic, P. (2007). If I look at the mass I will never act: Psychic numbing and genocide. *Judgment and Decision Making*. 2, pp. 1-17.
- Solberg, C., Rossetto, T., & Joffe, H. (2010). The social psychology of seismic hazard adjustment: re-evaluating the international literature. *Natural Hazards and Earth Systems Sciences*, 10: 1663 -1677.
- Sorenson, J.H. (2000). Hazard Warning Systems: Review of 20 Years of Progress. *Natural Hazards Review*. 1(2), pp. 119-125.
- Sorkin, A. R. (2009), Finding the right balance on Wall Street, *New York Times*, 24 September. Retrieved 13 December 2009, <http://dealbook.blogs.nytimes.com/2009/09/17/taking-a-chance-on-risk-again>
- Stott, P. (2010). *Global Average temperature records*, United Kingdom Meteorological Office. Retrieved 10 March 2010, <http://www.metoffice.gov.uk/climatechange/science/explained/explained5.html>
- Summerland Fire Commission (1974). *Report of the Summerland Fire Commission*. Government Office, Isle of Man.
- Turner, B. A. (1978). *Man-made disasters*. London: Wykeham Publications.
- Vörösmarty, C. J., Green, P., Salisbury, J., & Lammers, R. B. (2000). Global Water Resources: Vulnerability from Climate Change and Population Growth. *Science*. 289(5477), pp. 284-288.
- Walsh, K. J. E., Betts, H., Church, J., Pittock, A. B., McInnes, K. L., Jackett, D. R., & McDougall, T. J. (2004). Using Sea Level Rise Projections for Urban Planning in Australia. *Journal of Coastal Research*. 20(2), pp. 586-598.
- Weingart, P., Engels, A., & Pansegrau, P. (2000). Risks of communication: discourses on climate change in science, politics, and the mass media. *Public Understanding of Science*. 9, pp. 261-283.
- Werritty, A. (2006). Sustainable Flood Management: Oxymoron or New Paradigm? *Area*. 38(1), pp. 16-23.
- Westgate, K. (1975). *Flixborough - The Human Response*, Occasional Paper 7, Bradford Disaster Research Unit. Bradford: University of Bradford.
- Wharton School Publishing (2009). *Hope, greed and fear: The psychology behind the financial crisis*, Pearson Education & University of Pennsylvania, Philadelphia. Retrieved 21 September 2009, <http://www.whartonsp.com/articles/article.aspx?p=1338641>
- Wisner, B., Plaikie, P., Cannon, T., & Davis, I. (2004). *At Risk: Natural hazards, people's vulnerability and disasters* (2nd ed.). London: Routledge.
- Wolfenstein, M. (1957). *Disaster: A Psychological Study*. London: Routledge & Kegan Paul.
- Yamin, F., Rahman, A., & Huq, S. (2005). Vulnerability, Adaptation and Climate Disasters: A Conceptual Overview. *IDS Bulletin*. 36(4), pp. 1-14.

