

The being of urban resilience

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Introduction

The nature of urban risk and disasters is changing. For the first time in human history, more people live in cities than in rural areas. Recent figures from the United Nations estimate that 6.3 billion people – 68 per cent of the world’s population – will be living in urban areas by 2050 (UN 2018; UN-Habitat 2017). Many of these growing cities are located on the coast or in other hazardous areas that are increasingly threatened by floods, storms, earthquakes, fires, heat or cold waves and drought (IPCC 2014). As urban corridors continue to be built in areas where hazards are commonplace, more and more people will be living with the continual threat of environmental upheaval and climate change.

The unpredictable nature and intensity of hazards and disasters has a significant impact on mental wellbeing, and the level of suffering and stress that occurs during difficult times and following loss is profound. Nevertheless, disaster risk reduction and management and associated policy responses have, so far, mainly focused on building, sustaining or restoring socio-economic, environmental, and physical structures and systems for issues such as housing rehabilitation, water and sanitation, the enforcement of building codes, compulsory insurance, livelihood and food security.

While it is important that the community infrastructure and economy in susceptible areas are adaptive and capable of being restored swiftly, it is equally important to pay attention to the wellbeing of residents and responders in these emergent “at risk” spaces. However, there is an almost total absence of literature on the mental wellbeing of “at risk” populations, as sources of resilience that go beyond the individual.

Much of resilience theory has its roots in either natural resource management, or psychology and mental health literature (Cork 2010; Doppelt 2016). While the former highlights the importance of systems and governance, the latter focuses on individual wellbeing.

At the same time, there is a growing consensus that the complex global challenges posed by an increasing number of disasters and climate change cannot simply be solved by “business as usual” policy approaches. They require new social practices and a broader cultural shift to support resilience. As a result, the potential role of people’s inner dimensions and transformation is attracting increased attention from researchers and practitioners (O’Brien and Sygna 2013; Parodi and Tamm 2018; Wamsler *et al.* 2017; Wamsler 2018).

For example, recent advances in neuroscience research and other fields suggest that certain inner capacities, such as mindfulness, can open new pathways towards societal resilience (Goleman and Davidson 2017; Sharma 2017; Parodi and Tamm 2018). However, in the fields of disaster risk reduction, climate change adaptation and resilience their potential role has, to date, been largely ignored (Wamsler 2018). Mindfulness is generally defined as intentional, non-judgmental attentiveness to the present moment (Kabat-Zinn 1990). While rooted in Buddhist psychology, it is commonly seen as “an inherent quality of human consciousness” that is accessible to – and empirically assessable in – individuals, independent of their religious or spiritual beliefs (Black 2011:1). Since its introduction into Western science around 40 years ago, extensive research has linked mindfulness to established theories of attention, awareness and emotional intelligence (Buss 1980; Brown *et al.* 2007; Goleman 2011; Carroll 2016). Different theories and methods have also been developed for its understanding and assessment as cognitive/emotional capacity or dispositional characteristic (a medium to long-lasting trait, e.g. Baer *et al.* 2011; Sharma 2017), a state/ outcome (resulting from inner capacity training, e.g. Valk *et al.* 2017) and a process or practice (mindfulness training itself; e.g., Black 2011; Condon *et al.* 2013). On this basis, it is increasingly claimed to have the potential to support societal transformation (Goleman and Davidson 2017; Wamsler 2018).

The questions that underpin the lack of research into the role of mental wellbeing and mindfulness in building societal resilience include:

- How does the changing nature of hazards, and their impact, relate to individual wellbeing and resilience building? (section 2)
- What is the interface between disaster risk reduction, resilience building and mindfulness in current research? (section 3)
- What is the potential influence of mindfulness on building urban resilience? Or, in other words: What are the options for the inclusion of mindfulness considerations when developing a comprehensive framework for urban disaster resilience? (sections 4 and 5)

We assess these questions based on a review of current risk reduction, resilience and mindfulness theory and the literature on how socio-cognitive and socio-affective mindfulness, and associated practices, support the development of resilience. The results provide an overview of how the human mind, and mindfulness in particular, influences resilience at different scales. These observations lead to some initial conclusions and recommendations regarding how organizations can address resilience more comprehensively. Examples from practice and a potential operationalization of this approach are described in the context of sections 2–5.

The changing nature of hazards, and their impacts on individual wellbeing and resilience

It is generally accepted that extreme weather events and climate change are interdependent. Climate change, significantly influenced by toxins and pollutants produced by modern lifestyles and accelerated urban growth, is the primary reason for increasingly frequent and intense extreme weather events (IPCC 2014).

As a consequence, urban risk and the global impact of so-called natural disasters are increasing (Desonie 2007; Malik 2008; IPCC 2014; Mechler and Bouwer 2015). It is estimated that the equivalent of a new city, able to house one million people, must be built every five days between now and 2050 to accommodate global population growth (Norman, Steffen and Stafford-Smith 2014).

Such urban expansion will inevitably see more people exposed to more frequent and intense natural hazards, leading to increasing inequality as a result of the uneven distribution of disaster impacts. This uneven distribution is due to differential risk-reducing capacities, hazard exposure, and vulnerabilities with respect to geographic location, together with other issues such as access to public services, income, gender, age, health, and associated wellbeing (Wisner *et al.* 2004; Wamsler 2014).

The interlinkages between disasters, mental wellbeing, and resilience are manifold. Individual wellbeing influences people's vulnerability. At the same time, the most devastating impacts of hazards and disasters are often on mental health. In addition to the physical impacts (e.g. the destruction of structures and systems), hazards and natural disasters affect mental health and psycho-social-spiritual wellbeing at individual and societal levels through, for instance:

- Fears about personal safety;
- Stress caused by constant uncertainty and unpredictability (e.g. the timing and strength of a hazard, financial insecurity);
- Post-trauma reactions (behavioral problems, anxiety, depression, suicide, etc.) after fast-onset disaster impacts (e.g. death, depletion of physical, financial, and social resources);
- Increasing alcohol and drug abuse, interpersonal aggression, crime, violence, extremism, terrorism, etc. caused by psychological and emotional distress due to fast- and slow-onset hazard/ disaster impacts (e.g. heat waves and drought);
- The loss of a sense of place (e.g. through destruction or resettlement, loss of social inclusion);
- The loss of a sense of meaning, order and justice (e.g. regarding the causes of the hazard/ disaster or suffering) and related hope- and helplessness;
- Increase in existing health problems (e.g. asthma during hot weather or the outbreak of infectious diseases causing anxiety) (Doppelt 2016).

To this, we can add other mental aspects related to climate change, such as the link between global warming, consumerism, and capitalism (Moore 2015).

In order to prepare for the effects on mental health and wellbeing, different organizations and stakeholders are increasingly promoting the need for individuals to be resilient. During the past three decades, over a dozen theories of individual resilience have been proposed, including a debate regarding whether it is a *capacity*, *trait*, a *process* or an *outcome* (which is similar to the discourse on mindfulness; cf. section 1). Although there are many differences, several common features and concepts emerge. Two pivotal concepts are *adversity* and *positive adaptation* (Fletcher and Sarkar 2013), which are (implicitly and/or explicitly) reflected in a number of resilience definitions. These include: the ability of people in otherwise normal situations who are exposed to an isolated and highly disruptive event, such as death or a violent situation, to maintain relatively stable and healthy levels of psychological and physical functioning (Bonanno 2004), the capacity to rebound from adversity, misfortune, trauma, or other transitional crises with greater strength and more resourcefulness (McCubbin *et al.* 1997), and a dynamic process encompassing positive adaptation despite challenging or threatening circumstances (Masten *et al.* 1990) or in a context of significant adversity (Luthar *et al.* 2000). Windle (2011) adds a third concept: *resistance*. Resistance is the ability to counteract the negative effects of adversity and seek positive adaptation, rather than resist adversity itself. It is achieved through the application of *assets* (capacities and efficacy) and *resources* (contextual and environmental influences such as family support and community services). Together, assets and resources may be regarded as strengths.

Here, therefore, individual resilience is a process of effectively negotiating, adapting to, or managing significant sources of stress or trauma. The assets and resources available to the individual facilitate this capability for adaptation and “bouncing back”. An individual’s experience of resilience will consequently vary during their lifetime (Windle 2011). This also relates to finding meaning in what has happened, which emerges from a sense of community identity (from local to national). This can be encapsulated in narratives of resilience that include a sense of duty or obligation to come to the assistance of others during times of crisis, and the anticipation of adversity found in patriotic or religious obligations (Flynn 2008). In this context, Hillman (1983) argues that trauma is not what has happened, but how we see it; it is not, therefore, a pathological event but a pathologized image that has become intolerable. If these images cause stress, illness, and trauma, then recovery and wellness can arise from the imagination.

In practice, individual capacity for mindfulness has been increasingly advocated by various organizations as an essential skill to increase mental wellness and resilience (Wamsler *et al.* 2018). It is thought to help in preparing for, and navigating, a complex future, and is seen as a way to encourage adaptation to increasing adversity in burgeoning urban societies and bring positive meaning to these experiences. Capacity development to foster individual resilience is, for instance, offered by the Red Cross (e.g. Australian Red Cross 2015) and the OnTack Flood and Storm Recovery Program in Australia.¹ It aims to help people use their strengths to work through practical problems following disasters, provides information to enable them to understand their reactions, and guides them towards drawing up their own mental and physical wellbeing recovery plan.

The interface between disaster risk reduction, resilience and mindfulness: Research gaps

Disaster risk reduction is the concept and practice of reducing hazard and disaster risks through systematic efforts to analyze and manage their causal factors, including avoiding or reducing exposure to hazards, reducing the vulnerability of people and property, and improving response and recovery preparedness for adverse events (UNISDR 2009, 2015; Wamsler 2014). It is a cross-cutting topic that needs to be mainstreamed into the associated fields of development, response and recovery (Wamsler 2014). The aim is to increase societal resilience, i.e. societies’ capacity to resist, absorb, accommodate to and recover from the effects of a hazard/ disaster in a timely and efficient manner (UNISDR 2009). Many risk-reduction measures also directly contribute to better climate adaptation. In fact, in a context of increasing disasters and climate change, risk reduction and climate adaptation share the same aim, namely to reduce risk and increase resilience (Wamsler 2014). The question thus is, if mindfulness could be an essential capacity or skill in preparing for, and navigating, this complex future?

Our review shows that there is a dearth of scientific research at the interface between disaster risk reduction, resilience, and mindfulness, and there is a particular blind spot with respect to mindfulness in anticipatory risk reduction (Wamsler 2018). However, evidence regarding the potential role of mindfulness for supporting resilience is growing. In fact, mindfulness research is increasing at an annual rate of 30 per cent (Ericson *et al.* 2014; AMA 2016). Studies have found, for instance, that mindfulness training changes the physical structure of the brain and increases grey matter in regions involved in learning and memory processes, emotion regulation, self-referential processing, perspective taking, and response control (Luders *et al.* 2009; Vestergaard-Poulsen *et al.* 2009; Hözel *et al.* 2011; cf. section 4). Furthermore, research shows the positive influence of mindfulness and the associated cultivation of compassion and empathy on aspects such as: (1) subjective wellbeing; (2) the activation of (intrinsic/ non-materialistic) core

values; (3) consumption and sustainable behavior; (4) the human–nature connection; (5) equity issues; (6) social activism; and (7) deliberate, flexible, and adaptive responses (Brown and Ryan 2003; Brown and Kasser 2005; Shapiro *et al.* 2006; Brown *et al.* 2007, 2004; Amel *et al.* 2009; Goleman 2009; Jacob *et al.* 2009; Sheth *et al.* 2010; Ericson *et al.* 2014; cf. section 4). However, while all of these capacities are crucial in all phases and contexts of disasters, there are almost no studies on mindfulness that focus on disaster risk reduction and associated resilience building (Wamsler 2018).

The few studies that explicitly link mindfulness with risk reduction have examined mindfulness in the context of post-disaster response and recovery (with links to response and recovery preparedness) (Wamsler *et al.* 2018). They focus on assessing the potential of specific mindfulness-related interventions to improve mental resilience in a post-disaster context (cf. section 2). These interventions include mindfulness meditation or relaxation techniques aimed at disaster victims, aid workers (such as firefighters, health care professionals, and volunteers), and disaster researchers (e.g. Waeldeet *et al.* 2008; Catani *et al.* 2009; Matanle 2011; Smith *et al.* 2011; Hoerberichs 2012; Srivatsa *et al.* 2013; Eriksen and Ditrach 2015; Hechanova *et al.* 2015; Yoshimura *et al.* 2015; Zeller *et al.* 2015).

However, emerging research also indicates that mindfulness may open up new perspectives and facilitate cognitive/emotional, managerial, structural, ontological, and epistemological change that could support broader risk reduction and resilience building (Schwartz 2011; Bai 2013; Osborne and Grant-Smith 2015; Wamsler *et al.* 2017; Wamsler 2018). It can in fact lead to a fundamental shift in the way we think about – and ultimately act on – local and global economic, social and ecological crises, such as increasing disasters and climate change (Scharmer 2009; Ericson *et al.* 2014; Carroll 2016; Wamsler *et al.* 2017). Empirical research is though vastly lacking.

The first empirical study by Wamsler and Brink from 2018 addresses this gap by linking individuals' intrinsic mindfulness (i.e. their mindfulness disposition as opposed to external mindfulness interventions; cf. section 1) to both pro- and reactive risk reduction. Based on a survey of citizens at risk from severe climate events, it found that individual mindfulness is correlated with: greater motivation to take or support risk-reduction actions; deeper engagement in pro-social and pro-environmental actions; a reduction in fatalist attitudes; and an increased acknowledgement of climate change, which influences people's risk perception (Wamsler and Brink 2018).

Mind science: The potential influence of mindfulness on building urban resilience

In order to better understand the potential of mindfulness in building resilience, we need a deeper understanding of recent advances in social neuroscience, and how the mind influences our capacity to deal with risk and the suffering inherent in the occurrence of hazards and disasters (cf. section 2). Evidence-based mindfulness science offers new insights into how we can improve our capacity to address disaster and climate risk, with implications for the theory and practice of urban resilience.

The human brain evolved to deal with threats that existed in the Stone Age, notably predators – and an occasional disaster. However, people in modern societies face increasingly complex problems, such as climate change and disasters, which produce a constant flood of stimuli that our brain interprets as threatening (Doppelt 2016). It is well documented that the Flight–Fight–Freeze response has evolved in the human body as an automatic, built-in system designed to protect us from stressful situations, threat, or danger; however, it is counterproductive in improving risk reduction and building resilience. When faced with an event that is perceived

to be threatening, neuroscientists have found that information is instantaneously sent to the brain's locus coeruleus (the locus coeruleus is part of our brain stem involved with physiological responses to stress and panic). The immediate effect is to stimulate the limbic brain and the amygdala in particular (the brain's "fear and alarm center"), and sideline the prefrontal cortex (the "executive center" or thinking part of the brain) as the body puts all of its resources into protecting itself from the threat (Doppelt 2016). When people experience what they perceive to be a serious threat or trauma (e.g. caught by floods), the fear and alarm center is activated and they are unable to learn as the executive center has been sidelined. They can also adopt harmful coping strategies (e.g. alcohol abuse, overworking) to relieve mental stress. Because the body and mind are inextricably linked, self-destructive coping strategies can lead to a vicious downward spiral and physical breakdown (e.g. stroke, cognitive problems) (Doppelt 2016; cf. section 2). Our brains are thus not well equipped to deal with climate change and disaster situations.

At the same time, humans are able to reflect on their thoughts, which can enable us to consciously still our minds and calm our emotions. Daniel Siegel reminds us that "our species name is not *homo sapiens* – the one who knows. It is *homo sapiens sapiens* – the ones who know and know we know" (Siegel 2017, p. 277). Current scientific evidence confirms that if we are able to consciously still our minds and calm our emotions, e.g. through mindfulness training, we can build neural connections in areas that regulate, for instance, stress; this has implications for how we make decisions, how we improve our perspective taking, and how we engage with others (Goleman and Davidsson 2017).

Reported rates of stress, anxiety and professional burnout are all very high in risk and disaster settings (cf. section 2). Mindfulness can thus be a tool to reduce stress in those who are directly subject to disaster impacts, and those who must manage risk and disaster situations. In addition, it can help in cultivating our understanding of the human body as a complex "multidimensional network of interdependent systems each sending information and each affecting everything else" that improves our awareness of the mind–body, and related socio–environmental connections (Watkins 2014, p. 39). New policy processes that support individual resilience building, and that are targeted at urban dwellers faced with uncertainty or who are recovering from trauma, could thus improve risk reduction and increase people's ability to engage with integrity in urban resilience and justice at a wider community level.

This is also supported by the ReSource Project, a large-scale study on Eastern and Western methods of mental training, which found evidence that such training can cultivate social intelligence, prosocial motivations, and cooperation (Valk *et al.* 2017). While their initial trials were run in clinical, educational, and corporate settings, the study concluded that such interventions should also be conducted and tested with other groups, notably policymakers and first responders. In the context of urban resilience, one finding from the study was that different types of mental training elicit change in different areas, including attention, compassion, and high-level cognitive abilities, all of which are important in dealing with socio–environmental threats. The study concludes that "the socio-affective training that dealt specifically with compassion and perspective taking may be important not only for individual health, but also for communal flourishing".² Applying these lessons will also require policymakers to have a better understanding of their own minds and emotions.

Importantly, social neuroscience research shows that capacities of self-awareness, reflexivity, flexibility, adaptability, perspective taking, compassion, and empathy can be proactively increased through mental training, such as mindfulness (e.g. Davidsson and Goleman 2017; Siegel 2017; Valk *et al.* 2017). Managing with compassion is thus learnable and can be further developed through practice (Worline and Dutton 2017). Developing the ability to mindfully

“see” and respond to personal suffering could allow policymakers and first responders to better interpret and act in effective ways when alleviating suffering. In addition, it has been shown that mental training can also discourage competitiveness (Gilbert 2017). Developing a compassionate and empathic mind can thus create “certain patterns in our brains that organize our motives, emotions and thoughts in ways that are conducive for our own and other people’s well-being” (Gilbert 2013, p. 87).

When we put ourselves in someone else’s shoes, we use a part of the brain that is linked with creativity and social connections (specifically, the right inferior parietal lobe and the right lateral prefrontal cortex) (McGilchrist 2009). Developing this “empathy muscle”, based on a deep appreciation of another’s perspective, is pivotal for compassionate decision making, which is especially relevant in traumatic contexts. In order to make what Krznicaric (2014) calls the “imaginative leap of empathy”, we need first to learn to humanize the other and discover what we have (or do not have) in common. Mental training, such as mindfulness meditation, can be used to support empathy and related processes (Valk *et al.* 2017). At a minimum, such training should be considered for strategic planners who have to deal with the human aspects of urban adversity. Scientific evidence also suggests that the quality and form of relationships between humans, shapes connections between nerve cells in the brain. This indicates that mindfulness interventions cannot be encapsulated in “business as usual” policy options, but rather must be built into wider risk and disaster policy approaches e.g. by supporting platforms, structures and mechanisms for cooperation, personal development, and self-authoring (as in the past has been promoted in Nordic countries; Andersen and Björkman 2017).

One of the key insights of recent social neuroscience research is that mental training, such as mindfulness, can alter traits in the human body (Goleman and Davidson 2017). The definition of an altered trait is “a new characteristic that arises from a meditation practice – one that endures. Altered traits shape how we behave in our daily lives, not just during or immediately after we meditate” (Goleman and Davidson 2017, pp. 6–7). The most compelling impacts and relevance of mindfulness are thus not necessarily short-term interventions that can increase individual wellbeing (e.g. during response or recovery phases), but the wider and long-term personal, interpersonal, and socio-environmental outcomes that are key for proactive risk reduction and resilience building.

Conclusions

This chapter highlights the importance of addressing individual inner dimensions and associated cognitive/emotional capacities to support urban resilience. In particular, it shows that mindfulness disposition, practices, and training have the potential to contribute to all phases of risk reduction (development, response, and recovery) and at all scales – from the individual, to the institutional and societal levels:

- Individual risk reduction: for instance, by increasing psychological resilience, improving individual post-disaster response, recovery and growth.
- Public risk reduction: for instance, by influencing motivation to support risk-reduction efforts, risk perceptions and bias, risk communication, and new social relational approaches that challenge the business-and-power-as-usual norm. In this context, it is crucial to acknowledge that people are heterogenous in their thinking, and too often it is wrongly assumed that there is a simple, direct link between evidence and behavior, and policy and implementation.

- Risk-reduction policy integration: for instance, by influencing organizational decision taking, reliability and innovation, nurturing social capital, and providing an ethical basis to negotiate risk reduction objectives across different cultures and practices.
- Risk reduction science: for instance, by shaping new research questions, methodologies, and, ultimately, knowledge production.

Taken together, these four aspects form the key conceptual trajectories of what has been coined “Mindful Risk Reduction” (Wamsler 2018). They have a bearing on measures designed to increase resilience (i.e. hazard reduction and avoidance, vulnerability reduction, response and recovery preparedness, and associated mainstreaming). New cognitive/emotional methods, such as mindfulness-based approaches, have a role to play in enhancing decision making for pro-environmental and prosocial behavior and fostering compassionate and empathic neural responses that allow us to better connect with others in times of need, particularly groups we may not feel a natural connection to (cf. Weng *et al.* 2017).

As we expand our knowledge of the workings of the human mind, we are reaching a tipping point where this new understanding can be applied to urban resilience theory and practice. Some initial policy approaches are currently being tested. An example is the Mindfulness, Behaviour Change and Decision Making Programme that was conducted with municipal officials of the Welsh Government (including disaster and climate managers) to enable people to take greater control of their own behavioral systems and influence resilience-related issues (Pykett *et al.* 2016). Similarly, the Red Cross and the University of Miami offer mindfulness training to high-stress groups, ranging from the disaster-affected to firefighters and teachers, while the Garrison Institute offers similar programs to frontline trauma workers in Africa and the Middle East.³

New approaches should include, but not be limited to, mindfulness-based training that supports socio-affective (compassion, dealing with difficult emotions, and prosocial motivations) and socio-cognitive (perspective taking on self and others and metacognition) skills (Valk *et al.* 2017). Offering such training modules could help urban risk managers and planners to enquire into the relationships between emotion/cognition and bias and put people (with their values, beliefs, worldviews, and associated cognitive/emotional capacities) at the center of resilience planning to improve decision and better assist those directly affected. In addition, we need to create structures and mechanisms that can support and create conditions for such approaches, allowing to better integrate policy, practical *and* personal spheres of transformation (cf. O’Brien and Sygna 2013). Such approaches are still emerging, and only with a better understanding of our minds can we start to think about the social structures and mechanisms that are conducive to both wellbeing and resilience.

Therefore, while the two dominant responses to disasters and climate change – emission reductions (usually called climate mitigation) and ensuring that physical infrastructure and natural resources can withstand impacts (framed as disaster risk reduction or climate adaptation) – are essential, they are insufficient for the challenges that lie ahead. We also need to foster personal spheres of transformation and support the “being of resilience”. Through this, not only will we build the individual resilience that will help to mitigate harmful personal and social impacts and reactions, we will also improve societal wellbeing and resilience in times of increasing disasters and climate change.

Notes

- 1 www.ontrack.org.au/floodandstormrecovery/
- 2 <https://sharpbrains.com/blog/2018/07/11/study-finds-clear-yet-surprisingly-different-benefits-in-3-types-of-meditation-based-mental-training/>
- 3 www.garrisoninstitute.org/blog/fostering-resilience-among-aid-workers/

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