Resilience for public health

Supporting transformation in people and communities

Pete Seaman
Valerie McNeice
Gregor Yates
Jennifer McLean

Glasgow Centre for Population Health

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Glasgow Centre for Population Health

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Executive summary

Background

This paper explores the existing literature on resilience to find an application and understanding relevant to public health.

Resilience refers to the ability of individuals, places and populations to withstand stress and challenge. The concept has become subject to renewed interest and attention in recent times. Often the focus has been around preparedness – mitigating apparent vulnerability to events such as pandemics, extreme weather, terrorism or even volcanic ash clouds. For future public health, resilience thinking needs to go beyond preparing for isolated events to question the role that institutions, leaders and organisations play in creating vulnerabilities and in shaping society's ability to react to challenges, many of which are unpredictable. To this end, the authors arrive at a definition of resilience for public health as *the capacity for populations to endure, adapt and generate new ways of thinking and functioning in the context of change, uncertainty or adversity.*

Resilience at different levels: individual and collective resilience

The understanding of factors that promote resilience for individuals has been shaped by research within the field of child development. In particular, investigations of how some young people flourish in challenging circumstances. Such studies highlight the importance of both personality traits and factors external to the individual, pointing to the interconnectedness of personal and network factors in producing resilience. Beyond the individual, resilience can be approached at the level of communities, cities, regions or nations. Resilience at this scale concerns not only the population affected, but also the environment in which their resilience is tested; collectively referred to here as 'place resilience'. The significance of this concept is that people are not the primary focus for resilient outcomes, but are instead part of a wider system of interdependent factors. Community cohesion, neighbourhood social capital and integration have been highlighted as key features of resilient

places, while reduced social capital and cohesion can be seen as sources of vulnerability.

The application of resilience thinking: aligning culture, economy, governance and infrastructure

The paper presents an investigation of how resilient individuals and communities can be supported strategically. Four substantive areas of potential policy action were established following an extensive review of the literature around how individual and collective resilience might be built. These were agreed as: culture; the economy and work; infrastructure; and governance. For each policy area, a set of possible actions are proposed which we believe could help to build resilience within individuals and communities to both predictable and unpredictable future challenges. A brief summary of each is provided below:

Supporting resilience through culture

In its broader sense, ‘culture’ refers to the collectively-held values, expectations and norms useful for coping, adaptation and survival. These resources enable individuals to operate in a world which is made predictable and has a shared sense of regularity. However, culture can also offer new sources of collective meaning during periods of transition. Change must be balanced with the retention of a continuous sense of identity, often found through a continuity of connection to objects, places and relationships. Culture in its narrower sense of artistic or creative participation can assist in building relationships during periods of change.

Supporting resilience in the economy and work

Understanding how the economy and work relate to resilience involves a shift in the way the relationship between the two is normally understood: from asking what makes an economy resilient to how can the economy and forms of work contribute to the resilience of communities and individuals? Consequently, economic strategies should promote quality employment that fulfils the psychological dimensions of work, as well as its quantities, such as headline numbers of jobs created.

Supporting resilience through governance

During crises, local emergency services are often overstretched and fragile. At such times citizen activity can complement the work of frontline services. The task for leadership is to provide the conditions through which these networks can be created and sustained in times of business as usual and in crisis. Governance structures should support the development of social capital in communities, encouraging a diversity of voices and perspectives in the decision-making process.

Supporting resilience through infrastructure

Understanding resilience in relation to infrastructure is twofold: firstly, the resilience of the infrastructure itself to shocks, anticipated or unanticipated to allow a return to ‘business as usual’; and secondly, the manner by which infrastructure supports the sources of adaptation and transformation required for resilience to develop within communities. At a community level, good quality infrastructure can enhance opportunities for social activity and enable people to improve the quality of their social connections.

Overview

The resilience perspective offers value to public health through supporting the development of strong communities. In the face of a growing complexity in global trends and processes, the unpredictable nature of risk and where and what the next crisis or challenge might be, the resilience perspective provides a framework for enabling people and communities to not only bounce back but crucially, thrive beyond crisis.

Resilient individuals and communities cannot be created through the action of one particular professional group or area of policy. Actions must be aligned at the level of individuals with community development, economic planning, service provision and infrastructure planning. Structural and material issues also underpin resilience for people and places. Meeting basic material needs is a precursor for ongoing resilience and alleviating vulnerabilities (such as poverty), and although it is entirely possible to be resilient in the face of poverty and deprivation, successive periods of stress may serve to weaken,

and introduce vulnerabilities that break resilience over longer timeframes. A resilience perspective must complement, rather than replace, action to alleviate the causes of economic inequality.

A note on measuring resilience

Without a consensus on the definition of resilience, its measurement has been a persistent challenge. At an individual level, resilience has been framed around personal characteristics, attributes, attitudes, relationships, behaviours and personal resources, yet there remains no current ‘gold standard’ for the measurement of resilience at the individual level. The cultural appropriateness of any scale employed should also be recognised.

When focusing on the ability of communities and regions to cope in an emergency, resilience focuses on preparedness. This approach can neglect the fact that emerging challenges are not always known or understood, and therefore planned ‘predict and mitigate’ responses may not be appropriate or possible. At a regional or national level, attempts to provide a framework for measuring resilience have often compared places based on measurable indicators of sustainability, such as greenspace availability, recycling levels and carbon emissions. A more useful approach might be to consider what populations might need to enable transformational behaviours to come to the fore, for example, for populations to become more future-oriented and to develop collective values.

1. Purpose

Resilience refers to the ability of people, places and populations to withstand stress and challenge. The concept has become subject to renewed interest and attention in recent times. Often the focus has been around preparedness – mitigating apparent vulnerability to events such as pandemics, extreme weather, terrorism or even volcanic ash clouds. For future public health, resilience thinking needs to go beyond preparing for isolated events to question the role that institutions, leaders and organisations play in creating vulnerabilities and in shaping society's ability to react to crisis and change.

This paper explores the concept of resilience to assess its usefulness, relevance and key principles of application. Although written from a public health perspective, the findings should be of interest to a wide range of practitioners and policy-makers whose role focuses on improving the health of people and communities.

The right time for a resilience perspective?

We live in an age of multiple and interconnected challenges. Some of these present themselves as new problems, such as dealing with the consequences of climate change, responding to a global financial crisis or adapting service provision for an ageing population. Some challenges are older and of the intractable kind. Inequalities in income, opportunity and health represent challenges that persist because established patterns of response have so far failed to tackle them.

A resilience perspective can help in a societal context which is specialised, complex and diverse. In such circumstances, it becomes harder to predict where the next serious challenge will present itself and our predicament begins to look less controllable. The resilience perspective, as it is considered here, goes beyond finding effective interventions and programmes to reduce negative outcomes of predictable and controllable events. Instead, it provides an overarching framework for tackling challenges and stressors that are, by their nature, multiple and unpredictable. Such a perspective has great promise

for service providers, commissioners and individuals to pre-emptively develop mindsets and configure resources to support resilience, offering potential value in an age of uncertainty.

Resilience perspectives are kindred with asset-based approaches[a], which the Glasgow Centre for Population Health (GCPH) is also investigating. Both perspectives involve activity that is different, but complementary to, established 'deficit' ways of working. Instead of waiting for problems to present themselves downstream and attempting to reduce their severity, resilience perspectives focus on developing understanding of the processes and resources that enable people and communities to flourish and become better equipped to navigate risk, uncertainty and challenge. Supporting people and communities to enhance their vitality and viability in changing circumstances can also have beneficial cost implications, reducing demand on 'downstream' spending. The Christie Commission (2011) reported *"as much as 40% of all spending on public services is accounted for by interventions that could have been avoided by prioritising a preventative approach"* (p xiii). Making resilience perspectives a core part of policy and practice mindsets will support people and communities to enhance their vitality and viability in the face of challenge and change.

Handling the resilience perspective with care

By focusing on the resources and processes which allow people and communities to maintain positive outcomes in the face of challenge it is crucial to be mindful of the manner in which vulnerability can be created by power imbalances in society (Walker and Cooper 2011; MacKinnon and Derickson, 2012). Crisis should not be viewed as an inevitable fact of living in complex society in a manner that absolves policy-makers and politicians from their role in creating imbalances, insecurities and vulnerabilities which often compound existing disadvantage. Consequently, an apparent absence of resilience or failure to thrive in challenging circumstances should not be viewed as forms of

[a] Asset-based approaches value the capacity, skills, knowledge and connections in individuals and communities. They focus on the positive capacity of individuals and communities rather than solely on their needs, deficits and problems (McLean and McNeice, 2012).

deficit. This paper presents a critical engagement with the concept and implications for action while not wishing to exclude the material and structural injustices that frame many forms of community fragility and personal vulnerability.

About this paper

A convergence of numerous disciplinary interests (from psychology to engineering and ecology) has led to a crowded and potentially confusing landscape around the understanding and application of resilience as an idea. This paper presents a synthesis of these multiple understandings, and understandings at multiple levels of application (individual and collective), to support the work of those taking a public health perspective. The paper addresses the following questions in particular:

- What qualities or processes create resilience at individual and collective levels (communities, places, economies)?
- How does individual resilience relate to resilience at the collective level and vice versa? Does the resilience of one necessarily support the resilience of another?
- What perspectives and mindsets should inform actions to support resilience?
- What are the relationships between health assets and resilience?
- In what ways are economic circumstances (at a personal level and in terms of the wider economy) associated with and supportive of resilience?
- How can culture, the economy, leadership and governance, and infrastructure support the development of more resilient individuals, populations and places?
- What tools are available to support the measurement of resilience at individual and collective levels?

This paper presents a discussion of the concept of resilience in general terms, before synthesising the literature on individual and collective resilience. Actions that support resilience are drawn out. The paper then addresses the relationships between resilience and: cultural factors; the economy; leadership

and governance; and infrastructure. These four spheres of activity encompass several dimensions of resilience, with recurring themes within each demonstrating the potential for their alignment. Lastly, measurement issues are discussed.

2. What is resilience?

Resilience is both an everyday term and one found within technical disciplines. The everyday understanding of the concept is captured by the Oxford English Dictionary definition as *"rebounding or bouncing back"*; *"elasticity: the power of resuming an original shape or position after compression, bending,"* and *"the quality or fact of being able to recover quickly or easily from, or resist being affected by, a misfortune, shock, illness"* (Oxford English Dictionary, 2013). However, such definitions can tend towards understandings where the agency for resilience is located with the individual, as a trait of the person demonstrating it. This may lead to unease around the concept for those with an awareness of structural influences on both behaviours and outcomes.

The fields of developmental psychology, ecology, community development and materials science have all operationalised the resilience concept. Social scientific definitions of resilience highlight it as a process leading to positive adaptation in the presence of challenge. Ungar (2012) describes the resilience focus as shifting *"…attention from the suppression of treatment or disorder to the processes that enhance wellbeing among populations under stress"* (Ungar, 2012; p387). This bi-dimensional thinking recognises the presence of both outcome and challenge as essential for responses to be termed as resilient.

Networks, community and societal influences shape the presence of resilient outcomes. At an individual level, a more complete explanation understands resilience not only as a personally-possessed resource but also as relating to the nature of the risks and challenges the apparently resilient individual encounters, the frequency and intensity of such risks and challenges, and the range of responses available to that individual as provided or constrained by their environment.

Everyday definitions also highlight a return to pre-crisis conditions as being indicative of resilience. However, ecological perspectives highlight the

dynamism within systems and have led to understandings of resilience in which pre-crisis conditions are unobtainable. In such circumstances, transformation and bouncing-beyond, over bouncing-back, are indicative of true resilience. For example, at community, city or regional level, resilience has assumed importance in the face of growing uncertainty around future trends. The complex nature of these trends, and their multiple impacts, ensures that a return to pre-crisis conditions will not be possible. Climate change is one such example, with the need to maintain resilient places in light of environmental challenge leading to increasing uncertainty about the viability of communities to support the ways of life to which they are accustomed. Peak oil[b] is another trend-orientated consideration to which current patterns of life and the economy are vulnerable. Resilient responses to peak oil will not only provide the means of thriving in an economy that depends less on fossil fuels, but could also delay the onset of climate change. Resilient responses therefore, are often responses and adaptations in the face of complexity, where action in one area will have consequences in others. Some of these consequences will be predictable, but others will not have been considered.

The concept of resilience has been, and continues to be, applied across a wide range of academic and practical disciplines. The lack of consensus around how it is defined is not necessarily problematic and efforts to find a universal definition for the term may not be as useful as focusing attention on finding definitional agreement within the different contexts or circumstances in which it is being used.

[b] Peak oil is the point in time when the world's oil supplies go into irreversible decline, following a maximum rate of extraction. There is some debate as to whether peak oil is very close to being reached or has already passed.

3. Resilience and individuals

The study of factors that promote positive outcomes for individuals under stress, strain or setback has its modern roots in studies of human development, particularly in the field of developmental psychology. Application and further research opportunities arose in the related areas of social work, child development and criminology. Consequently, the bulk of early primary research has tended to investigate resilience processes within the worlds of children and young people.

Individual resilience has been explored with adults more recently, particularly in relation to ageing and people living with long-term conditions (Reich *et al*., 2010) or in poverty (Garmezy, 1993; Furstenberg *et al.*, 1999). However, the study of resilience during childhood gave rise to many of the key concepts. Its historical development can be found in the ideas of Antonovsky (1979), particularly the notions of salutogenesis (processes involved in the creation of health) and sense of coherence (the ability to construct a view of the world as meaningful, manageable and predictable). Hill *et al.* (2007) have also aligned resilience thinking with the re-emergence of asset-based approaches (see also GCPH, 2011).

Although some claim resilience "*suffers from too many definitions*" (Pertrillo and Prosperi, 2011; p601), Windle (1999) identifies a *"most agreed upon definition"* of individual resilience, as the *"successful adaptation to life tasks in the face of social disadvantage or highly adverse conditions"* (p.163). Allied definitions include *"developing well despite risk status or exposure to adversity"* (Masten and Powell, 2003; p2) and *"a universal capacity which allows a person, group or community to prevent, minimise or overcome the damaging effects of adversity*" (Grotberg, 1995; p2).

However, apparent similarities in definitions can disguise difficulties in understanding what kind of quality resilience represents when observed at the level of the individual. Is resilience, for example, indicated by and reducible to the presence of positive outcomes, where a good level of functioning has

been achieved despite challenge or adversity? A related question is whether coping with crisis is the same as resilience. Boyden and Cooper (2007) view coping as struggling or dealing with difficulties, which, although implying some degree of success, does not indicate longer-term positive adaptation. Resilience and coping need to take account of short, medium and longer term timeframes in their assessment. Indeed, viewed over longer timescales, poorer functioning may follow an initial period of apparent coping.

Other difficulties emerge around the type of response observed. Some researchers identify the absence of subsequent trauma or diagnosis in the presence of severe stress, trauma or challenge as evidence of resilience (Luthar and Zelazo, 2003). Others, such as Walsh (1998), require evidence of improved functioning and response for resilience to be identified. This implies not just recovering to a prior state after stress and hardship but to have rebounded strengthened and become more resourceful.

Introducing the notion of improvement highlights how more contemporary understandings of resilience relate to transformation in response to stress. This also appeals to a real world sense of complexity, where the restoration of pre-stress circumstances and functioning is not possible given the ever-changing and fluid nature of those circumstances. However, evidence from the Psychological, Social and Biological Determinants of Ill Health (pSoBid) study (GCPH, 2013) highlights the importance of timing, and the timescales that we might apply to resilience, by demonstrating epigenetic[c] costs of 'coping' with stress in early years (McGuiness *et al*., 2012; GCPH, 2013). The pSoBid study found that stressful environments in early life, even when an individual appears to have successfully coped and adapted to a later adult role, continued to exert an influence at their genetic level.

[c] Epigenetics refers to the study of heritable changes in gene expression caused by mechanisms other than changes in the underlying DNA sequence, for example, by environmental factors. For further examples, see a summary of Prof Rachel Yehuda's talk 'How the effects of traumatic stress are transmitted to the next generation', GCPH Seminar Series 9, lecture 5 (Yehuda, 2013).

This adds an intergenerational component to what researchers have identified as *"apparent resilience"* (Newman *et al*., 2004) – when initial evidence of coping may disguise underlying dysfunctional and non-productive responses on longer timeframes. Werner notes the *"psychic costs of at-risk children who manage to grow into competent, confident and caring adults"* (Werner, 1990; p115). Apparently resilient people can be withdrawn, defensive and confrontational and, more dramatically, it has been suggested that *"those most resistant to stress often have a sociopathic aspect to their personalities"* (Glover, 2009; p6 citing Rew, 2001).

This calls for consideration to be given to the problem of positive adaptations in immediate circumstances which "*generate other negative outcomes in different circumstances"* in the future or in different environments (Boyden and Cooper, 2007; p7). Such examples include children who display *"false maturity"* and the appearance of coping by adopting a caregiver role but are later susceptible to depression and anxiety (Boyden and Cooper, *Ibid*; Hetherington and Elmore, 2003) and apparent resilience against adversities of war resulting in *"emotional numbing"* (Boyden and Cooper, *Ibid*) and an inability to empathise.

A universal perspective on what constitutes a resilient outcome is also made difficult by the unequal distribution of risk in society. Deprivation tends to be experienced in multiple forms and the greater frequency, intensity and variety of risks faced by those in harsher socioeconomic circumstances can make straight comparisons difficult. Individuals or groups identified as resilient may simply have faced less challenge. As well as taking account of the unequal distribution of risk and challenge in society, it is important to question the normative assumption underpinning the identification of a resilient outcome. Critics have argued that such outcomes are grounded on middle class definitions of success in western capitalist economies (Harrop *et al*., 2006). Outlooks and perspectives at the stigmatised margins of society could be understood as resilient responses through providing alternative forms of status, reputation and an active choice against the ascribed identities associated with disadvantaged positions (Bottrell, 2009). For example, studies

of young motherhood (in the UK, a socially stigmatised identity) highlight how a 'good mother' role can confer an adult role status, self-validation and social approval for women within socioeconomic circumstances where access to other routes of social approval are hindered by disadvantage. McDermott and Graham (2005) describe this as *"a form of identity work in which young women in disadvantaged circumstances make use of the discursive resources available to them"* (p72).

Similarly, cross-cultural comparisons of resilience processes and adaptations can be difficult given differing definitions of 'success' between cultures and the needs of labour markets defined locally.

Learning from research with children and young people

As discussed previously, most early primary research investigated resilience processes with children and young people. Published reviews explored childhood resilience in light of risk factors including poverty, growing up in abusive and alcoholic families, experiencing homelessness, chronic illness and disability, teenage mothering and juvenile delinquency (Kumpfer and Bluth, 2004; Harrop *et al*., 2006; Pinnock and Evans, 2008). Available research which illustrates types of adversity or stressor includes:

- living on a low income or in a disadvantaged neighbourhood (Garmezy, 1993; Arroyo and Zigler 1995; Furstenberg *et al*.,1999)
- experiences of abuse and maltreatment (Anderson 1997; Bolger and Patterson, 2003)
- bereavement (Lin *et al*., 2004)
- parental separation, migration, disability, physical or mental health problems in self or key others
- peer rejection; and pre- and postnatal problems (Hill *et al*., 2007).

Such primary research is centred on risk factors and can be criticised for its tendency to list variables without exploring the underlying mechanisms and processes of adaptation and protection. Nonetheless, the sheer scale of resilience research in the human development literature is valuable, allowing

syntheses to identify characteristics and processes which recur as mitigating the effects of a range of stressors, risk factors and adversities.

One way in which the variety of outcomes, protective traits and resilience processes can be systematised is by their separation into intrinsic, individual or internal characteristics and extrinsic, environmental or family/network characteristics and processes. The separation is not made easily and many of the intrinsic factors found in children and young people are often dependent on the presence of supportive parents and care-givers. Other personal characteristics are dispositions that allow the successful negotiation of resources and opportunities found within the external environment. For children and young people growing up in stressful environments, the following factors have been proposed as components of resilience pathways (adapted from Hill *et al*., 2007).

Intrinsic, individual or internal characteristics which facilitate resilient outcomes to stressors include:

- Intelligence and academic ability (Gilligan, 2001)
- Self-efficacy and mastery (Glover, 2009)
- Self-esteem (Glover, 2009)
- Autonomy and internal locus of control (Hill *et al*., 2007)
- Social competence (Masten and Coatsworth, 1998)
- Capacity for problem solving, planning, foresight (Werner, 1990)
- Expressiveness, warmth and affection (Luthar and Cicchetti, 2000)
- A secure base, emotional security and attachment style (Gilligan, 1997, 2012; Rutter, 1999)
- Ability to establish, maintain and access networks of neighbours (Reich *et al*., 2010).

Extrinsic, environmental and family network characteristics and process which facilitate resilient outcomes to stressors include (Daniel and Wassell, 2002):

- At least one secure attachment
- Access to wider supports such as extended family and friends
- Positive community experiences
- Strong parent-child relations, supportive family environments, cohesive, warm, supportive and communicative family environments
- Authoritative parenting styles.

Such learning has implications for the resilience of adults as well as children and young people. The combination of individual characteristics and wider network / environmental processes required for resilience supports the claim that *"without attention to the social as well as psychological capacity within our communities, models of resilience may have limited applicability"* (Zautra *et al*., 2010; p5).

Resilience is a dynamic interaction between an individual, their stressor(s) and the resources in their environment. Not only do individuals need the skills and capacities to take advantage of resources that can help them react, cope and adapt to challenge but an individual's network and environment should, crucially, be able to provide these resources. Here, the metaphor of resilience shifts from an understanding akin to a material property able to withstand stress (elasticity, strength or flexibility) to an ecological metaphor, of the ability to adapt and remain successful within a larger system. Resilient individuals demonstrate a transformative capacity to take advantage of changed conditions.

Growth in the interest and application of 'reframing' strategies in recent years, such as cognitive behavioural therapy (CBT), highlights the belief that resilience processes involve adaptive responses to problems rather than treatment to eliminate the cause of adversity. However, as critics of the positive psychology movement usefully make clear, the crucial and underlying nature of material circumstances and of social justice – poverty and inequality

– cannot be addressed by positive thinking alone (see Friedli, 2012, for example).

Learning from research with adults

Studies of adult resilience have been able to focus on the dimensions and processes of longer-term adaptation and protection. A range of adversities, risk factors or challenges have been investigated in adults, including ageing (Hayslip and Smith, 2012) and migration (Castro and Murray, 2010). Again, the literature stresses the interplay of internal, interpersonal, environmental and structural factors. Attention is given to how adversity and challenge are understood across the life-course enabling a perspective on resilience going beyond 'bouncing back' to offer insight into factors that promote the sustainability of responses. Kelly has proposed a *"forward lean toward engagement, purpose and perseverance"* (quoted in Zautra *et al*., 2010; p6) through which personal resources can be configured to allow growth beyond current challenges. The threat to resilience in such circumstances becomes the amount of stress and adaptation tolerable *"without a fundamental change in the capacity to pursue the aims that give meaning to life"* (Zautra *et al*., 2010; p6).

Research investigating the potential challenges of ageing and associated loss of capability through physical or mental deterioration has developed new understandings around resilience processes. Interpersonal relationships and sense of belonging to a community have been identified as crucial to supporting and sustaining resilient adaptation (Aldwin and Igarashi, 2012). Consequently, spiritually-based communities can be instrumental in offering practical and emotional support but also an overarching meaning to life guided by core beliefs, sense of community and a narrative which can produce comfort and familiarity. However, resilience in later years also requires change in economic and working practices to provide environments that allow positive adaptation and the possibility of changing roles and responsibilities consistent with being a valued employee, team or community member (Sterns and Dawson, 2012).

In the context of the challenge and disruption of migration, examples of resilient migrants demonstrate the role of narrative in enhancing individual resilience. Again, the dimensions of internal attributes, social support and structured opportunity all have a role. For example, the capacity to acquire new skills and cultural competencies, such as learning about local and regional social customs, are implicated (Castro and Murray, 2010). These abilities enable negotiation and navigation of opportunities and resources within the host culture, as do the willingness and ability to learn new linguistic and occupational skills. Also indicated is an ability to establish new networks of neighbours from whom social support can be accessed. This requires not only an appropriate disposition (of being open and sociable), but also the availability of community-focused activity and opportunities for social interaction, which can lead to acceptance and integration. However, processes of discrimination in communities and workplaces deny individuals access to opportunities regardless of individual dispositional attributes. Personal capacities for resilience are interconnected with social and environmental contexts and influences.

Continuity and familiarity are also resources for resilience. In adapting to new cicumstances, maintenance of a sense of the familiar or aspects of old, provide support and coherence. Migrants who participate both in the larger community of their host culture *and* maintain their native heritage, tend to exhibit lower stress than those who either assimilate entirely or separate themselves from the host culture (Berry, 2005). An explanation for why continued engagement with cultures of birth is resilience-enhancing in times of personal upheaval may lie in Thompson’s 1969 definition of culture as providing the collective beliefs, values, expectations and norms that encode forms of survival and problem-solving useful for coping, adaptation and survival. Conceived in this way, it would be antithetical to the notion of resilience to deny oneself access to sources of meaning and coherence. However, it is from within the resources the host culture offers in terms of educational, economic and cultural capitals that social mobility and success will stem.

Again, caveats should be noted around hidden harms or *"apparent resilience"* (Newman *et al*., 2004) based on successful outcomes on a limited range of indicators or inappropriate timeframes. The point is not that systems of meaning in Thomson's definition (above) remain static, but that they adapt to help provide explanations and a 'sense of coherence' to changed circumstances. Individual resources and dispositions for resilience can be focused on the opportunities provided by changing conditions. For example, in the cases of those who successfully overcame a variety of childhood adversities, explanations of success focused on the selection or construction of networks that reinforced and sustained their active outgoing dispositions during transitional periods such as adolescence (Werner and Smith, 1993). Their life trajectories revealed cumulative *"interactional continuity"* (Werner and Johnson, 1999; p264).

Changes in role, and in the stories others construct for us, can provide a challenge to continuity. In exploring how strengths-based and empowerment-orientated perspectives can be utilised by practitioners working with older people, Chapin and Cox (2002) stressed the need for storytelling and re-storying:

"The paradigm of midlife decline must be replaced with one that creates expectation of continued growth and development through all stages of life."

(Chapin and Cox, 2002; p168)

At the level of practice this involves listening to individuals' definitions of problems and their having a voice in decisions made about them. This not only reframes the individual as capable of contributing to solutions (as opposed to being in deficit or solely in receipt of treatment or intervention) but also helps build a sense of continuity and choice in narrative. Adaptations and change are required, while avoiding the discontinuity inherent in imposed deficit-based narratives of age-related decline. Again, work across multiple levels is needed – the personal, interpersonal and political. Alongside sensitivity to the individual client's story and meaning-making, more broadly *"the stories of older adults who have lived life fully until death, despite*

physiological and resource decline, need to be heard again and again" (*Op Cit* p170).

Interrelationships between the multiple sources of resilience should be borne in mind. It is also important to recognise that the individual capacities most frequently cited are often social in their origin and pro-social in their application. For example, social competence, capacity for problem solving, or expressiveness, warmth and affection are all results of interactions, not only flowing inwards from others but at the same time outwardly, to allow individuals to better navigate and contribute to social life and community. Individual resilience and resilience at collective levels (community, city or region) may therefore be differentiated by how resilience is being measured, rather than fundamental differences in the phenomena. Collective resilience is examined further in the following section.

4. Collective resilience

The majority of early studies of resilience focused on individual level outcomes. However, perceived threats such as climate change, food insecurity, peak oil, terrorism and the ongoing financial crisis have further highlighted the interdependent and fragile nature of global systems. Such concerns have fuelled a growing interest in resilience at a scale that extends past resilience at the individual level.

Beyond the individual, resilience can be approached at the level of communities, cities, regions or at a national or international scale. Resilience at these levels concerns not only the population affected, but also the environment in which their collective resilience is tested. The concept of 'place resilience' has been used to describe the interaction of influences within a geographically defined space. This form of resilience has been applied across the range of factors which contribute towards how places function (such as the economy, the physical environment and the social cohesion of the local population). The significance of this concept is that people are not the primary focus for resilient outcomes, but are instead part of a wider system of interdependent factors. Within this paper, resilience explored and measured at scales above the individual is termed 'collective' resilience. The reason for this is not to deny the importance of the multiple factors influencing the population of a place, but instead to apply a population health perspective which puts people at the core of how places function. Based on detailed examination of the literature and improved understanding of the key factors which could influence or threaten societal functioning, the following definition of collective resilience is proposed:

'the capacity for populations to endure, adapt and generate new ways of thinking and functioning in the context of change, uncertainty or adversity'.

Contrary to alternative definitions, resilience here includes transformational capacity as a necessary function in responding to changing circumstances. This incorporates the dynamic and unpredictable nature of future challenges while acknowledging that existing modes of living are not sustainable.

Perspectives on collective resilience

Understandings of collective resilience have developed across a number of disciplines and reflect the concerns of each field. Approaches have largely been developed around the capacity of places (rather than people) to withstand threats, with common themes and areas of attention identified to inform action and leadership around resilience. Economics, climate change and disaster studies, and community development studies continue to build a growing understanding of the processes and pre-requisites that support resilient places and populations. Ecological studies provided the early frameworks and 'systems'-based perspectives that have been influential in contemporary understandings of the concept (see Holling, 1973; Holling, 2001; Holling and Gunderson, 2001; Olsson *et al*., 2006; Walker and Salt, 2006).

Ecological perspectives

The field of ecology introduced a systems perspective to the study of communities, cities and other scales of place, which evolved from the study of natural systems. Holling described two defining characteristics of a resilient system. First, the ability of a system to absorb changes and persist, and second, the size of disturbance a system can tolerate before it shifts into an alternative configuration (Holling, 2001). This second dimension takes the understanding of resilience beyond 'bouncing back' to transformation – on reaching some tipping point, a resilient system has the ability to 'flip' into a new way of being, in order to maintain function, often at the expense of form. This represents a similar process to the transformative aspect of individual resilience discussed earlier.

Ecological perspectives propose a four-phase cycle of adaptation and change which is termed 'panarchy'. Ecologists adopted this term as a corrective to the

top-down, static nature of the common meaning of ‘hierarchy’. Instead, a ‘panarchy’ is a representation of a hierarchy in which systems (both natural and human) are interlinked in continual, adaptive cycles of growth, accumulation, restructuring and renewal (Holling, 2001).

The panarchic model describes a dynamic relationship where the balance shifts between stability and instability as a consequence of accruing resources (the rapid growth phase), exploiting these resources, and the rigidity that follows from ‘successful’ actions. The rapid growth phase is characterised by seizing opportunities and accumulation and is akin to everyday ideas of change such as economic growth. However, within this stage are the seeds of vulnerability. Stability, certainty and rigidity in systems lessen resilience to threats and hold the potential for collapse. In the face of a shock or crisis which leads to the collapse of the rapid growth phase, the accumulated potential is released and the system enters a time of uncertainty and *“creative destruction”* (Schumpeter, 1950, cited in Holling, 2001). When uncertainty is greatest and potential is high, innovation is most likely to occur and while some innovations fail, others survive and adapt in a succeeding phase of growth.

Panarchic thinking highlights an important point about the flexibility of systems, the inevitability of crisis resulting from growth, and that opportunity, potential and innovation can thrive in times of uncertainty and weakened controls. However, a key distinction between natural and human systems is that the latter contain conscious beings capable of conceptualising and looking towards the future. Thus, communities and cities can develop plans for recovery and renewal that allow the system to develop in a new and different trajectory. Communities, and other scales of human systems, are numerous, overlapping and linked, and in constant change. Death and decay (or ‘release’) is a natural part of the panarchic cycle of these systems – notions which can be difficult to accept in human terms as evidenced, for example, by the recent public sector bail out of banks on the brink of collapse. Wallace and Wallace (2008) argue that such patterns in human systems are not natural ageing processes but products of policy.

While the term ‘transformation’ permeates the ecological literature, it is often used to describe changes that result in, at least initially, a degraded state. Latterly, Walker and Salt (2006) have applied ecology principles to the real world and discuss ‘adaptability’ in terms of the capacity of people within communities and cities to influence resilience at the collective level. Their work, along with that of fellow ecologists, introduces recognition of diversity, leadership and opportunity in relation to resilience and systems. These concepts are discussed later in this paper.

Urbanist perspectives

Global population growth and rapid urbanisation have vastly increased the number of people living in cities and urban areas (WHO, 2013). Emerging threats from current trends (sustainability, climate change, terrorism) combined with the potential fragility of city living has seen disaster planning and recovery coming to the fore of a wider set of urbanist concerns about ‘place’. Focused on architecture and the built environment and largely dependent on engineering principles, the resilience of places is hinged on the physical structures and their connection with the people inhabiting and utilising them.

Here, resilience is commonly understood in its more limited sense of ‘bouncing back’ – *“the capacity of a city’s economic, social, political and physical infrastructure to absorb shock and stresses and still retain their basic function and structure”* (Applegath, 2012). At its most sophisticated, urbanism can also incorporate transformative dimensions looking at improving the lives of people within cities, rather than returning to pre-event equilibrium. However, given the event/threat focus, resilience within urbanism is often synonymous with readiness. For example, the urbanist approach to sustainability focuses on anticipating and mitigating risk and ensuring speed and efficiency in response to events (Martin-Breen and Anderies, 2011).

Within this perspective, leadership, communication and partnership are closely related to resilience. Leaders must adapt to changing priorities

(Pertrillo and Prosperi, 2011), address vulnerabilities, develop partnerships and build good channels of communication (Pelling, 2003). If not well managed, disasters can result in a collective sense of helplessness, isolation and decline of social pride (Kendall *et al*., 2011). Vulnerability may also accumulate with each successive disaster event. However, disaster has the potential to be recast as an opportunity for personal development and growth. The key factor here lies in whether individual and collective meaning can be drawn from the event, akin to Antonovsky's 'sense of coherence' (Antonovsky, 1993). As with the earlier discussion around resilience of migrants, throwing out memories and sources of collective meaning-making from the old, damaged life must be balanced with retaining a continuous sense of identity, often found through a continuity of connection to objects and places. As Kendall *et al.* state: *"Any fresh start should not come at the expense of social foundations"* (Kendall *et al*., 2011; p521).

Couching collective resilience in terms of 'bouncing back' or balancing equilibria can lose sight of the potential to transform. Bouncing back is necessary but not sufficient. Resilience focused on the creation of new efficiencies and the mitigation of predictable risk, can have the unintended consequence of promoting rigidity and vulnerability. Such preparatory action is undoubtedly necessary, but should be balanced with action that can assist in navigating uncertainty. Indeed, the emerging literature around social explanations of resilience advocates a greater focus on collective learning and adaptation.

"Community resilience requires an altogether more nuanced and subtle approach that is premised on institutions and organisations letting go, creating the necessary framework for action, rather than developing specific plans and allowing community resilience to emerge and develop in local areas over time. …community resilience resembles a patchwork of ideas, action and exercises."

(Edwards, 2009; p80)

Social explanations: connectedness and social capital

Influenced by the fields of community development and sociology, social models of resilience are concerned with a community's ability to reshape thinking and action both in planning for and in response to internal and external factors. This view of resilience puts people at the centre and, as compared with the urbanist perspective, focuses on social explanations for resilience.

"Community resilience means the capacity of communities to respond positively to crises. It is the ability of a community to adapt to pressures and transform itself in a way which makes it more sustainable in the future. Rather than simply 'surviving' the stressor or change, a resilient community might respond in creative ways that fundamentally transform the basis of the community."

(Australian Government, 2009; p5)

Landau and Weaver (2006) describe community resilience as a community's capacity to *"withstand major trauma and loss, overcome adversity, and to prevail, usually with increased resources, competence and connectedness"* (Landau and Weaver, 2006 cited in Bajayo, 2010; p2). A community's belief in their own collective ability to adapt and thrive has been highlighted by the Young Foundation as a key characteristic of resilient places (Mguni and Caistor-Arendar, 2012) pointing to the centrality of culture as well as infrastructural considerations.

The character of connections between individuals within communities is an enabling aspect of resilience. Community cohesion, neighbour social capital and integration have been highlighted as key features of pre-event resilience (see, for example, Pelling, 2003; Edwards, 2009; Bajayo, 2010). Declining social capital and cohesion can be seen as fragilities that accompany the rapid growth or conservation stage of the panarchic model. As Putman described in 'Bowling Alone' (Putnam, 2000): *"Creating (or recreating) social capital is no simple task. It would be eased by a palpable national crisis, like*

war or depression or natural disaster, but for better or worse, America at the dawn of a new century faces no such galvanising crisis" (p402).

Current global crises may lead to questions about whether social capital is released as an inevitable result of collapse. Allowing social capital to develop pre-crisis would be a better guarantor of its availability when required. Different varieties of social capital need to be recognised as offering different types of protection and insurance. These forms of capital have been categorised as 'bonding', 'bridging' and 'linking' (Woolcock, 1998; Halpern, 2005).

Bonding capital describes relationships grounded in similar outlooks and values and is a source of social support at a level close to the individual. *Bridging capital* represents links to different outlooks, views and experiences and *linking capital* represents links to institutional power such as those gained through participation in local decision-making or by having access to power elites. Bonding capital is beneficial in providing support for and recognition of one's outlook, thereby bolstering sense of coherence. In providing social support, bonding capital can be an important resource for assisting an individual's return to pre-crisis functioning ('bouncing back') in circumstances where restoring such a set of conditions is possible. However, the absence of bridging capital leads to fragility. Granovetter's work on 'weak ties' (a cognate of bridging capital) found such ties useful for successful responses to the crisis of unemployment i.e. finding new work (Granovetter, 1974; 1983). Bridging capital is therefore important when resilience of the transformative variety is required ('bouncing beyond') as a return to pre-crisis conditions becomes impossible (for example, when a work-role or industry no longer exists).

The relationship between bridging capital and resilience at a community level lies in provision of *"the patchwork of ideas, action and exercises"* (Edwards, 2009) which offer options and possibilities to both individuals and their networks and communities. These 'ideas' offer the raw material for developing creative responses to unanticipated problems. Communities strong in bridging

capital have the potential to administer appropriate and timely responses to shocks – a capability which can be dampened by the over-centralisation of responses. Kawachi describes collective efficacy – *"the ability of residents to organise and engage in collective action"* (Kawachi, 2010; p167) – in the aftermath of the 1995 Kobe earthquake in Japan. The presence of community development associations (forms of bridging capital) accelerated rescue operations and helped maintain social cohesion post-crisis (cited in Morgan *et al*., 2010).

Linking capital represents links to leadership and opportunity. When present it allows a two-way flow of information between the 'grassroots' or 'periphery' to the 'top' or 'centre' where decision-making, resource allocation and strategic planning is located. This allows attendant knowledge of emerging threats, potential solutions and unreleased capacity to flow from one to the other. The NESTA report *'The Ownership State'* (Blond, 2009) provides an outline of how governance structures could be configured to promote linking capital. Inspired in part by shared ownership models (e.g. the John Lewis Partnership), by reducing the distance and distinction between the 'frontline' or 'periphery' and the 'centre' of planning, responses to intelligence can be quicker via more distributed decision-making. In such circumstances, individuals have increased stocks of linking capital by being closer to the decision-making action. Linking capital therefore becomes a feature of an entire system (or sub-system) and not just a characteristic of individuals.

The ways in which leadership and governance can enhance resilience are further discussed in section 5.3.

5. Supporting resilience at individual and collective levels

Transformational capacity requires both mindset and actions. These are discussed in this section, with reference to both individual and collective resilience.

Resilience as forward lean

To support individual resilience, it is most useful to consider resilience as a process or pathway rather than a trait. Narrative can frame resilient or non-resilient pathways meaningfully to provide coherence and sense of direction. The dynamic nature of both biographies and social environments mean returning to pre-crisis circumstances is rarely possible. Resilient narratives are those that adapt to take account of changed circumstances and incorporate challenge beyond crisis – what Kelly describes as *"forward lean towards engagement, purpose and perseverance"* (Zautra *et al*., 2010, p6). Developing such narratives involves changing perspectives of a challenge or crisis to use it to imagine and work towards a post-crisis state of harmony.

An example is the application of the *Strengths-Focused and Meaning Orientated Approach to Resilience and Transformation* (SMART) in response to the SARS epidemic that affected Hong Kong in 2003 (Chan *et al*., 2006) which illustrates supporting growth perspectives at a time of crisis. A foundation of the SMART perspective is that trauma and growth go hand-in-hand. Recognition of the possibilities of growth accessible through trauma has also been demonstrated to shorten recovery times and lead to positive longer-term gain in the experiences of cancer survivors (Johnson Vickberg, 2001).

The focus of Chan *et al*.'s research however was not the treatment and recovery from SARS itself but *"the invisible damage to public mental health"* (p11) that can stem from societal traumas. The SMART programme (see box below) complemented the pathology-based frameworks of medicine, psychology, social work and public administration, and was geared toward the removal of symptoms and restoration of pre-crisis functioning. Recovery was understood to rest upon a model of harmony after crisis resolution and sought

to balance the personal search for meaning in life, spiritual growth and integration with the systemic need for positive relationships of social cohesion, social integration and mutual help.

A difficultly of the SMART approach may lie in its cultural specificity; in western culture the tradition of understanding a crisis or pain as opportunity is less strong. This can lead to insensitivity and bluntness of application. For example, Barbara Ehrenreich (2010) has written of the misapplication of reframing in relation to cancer survival, whereby failure to thrive in the face of adversity can be cast as a dimension of individual failing. Chan *et al*. (2006) also highlight a limitation of the approach; its operation on an individual basis and over long timeframes. In moments of acute societal crises, governments and the public alike look for rapid responses with a wide impact.

The SMART framework for complementing pathology-based responses

Emphasising growth through pain
Instead of focusing on the loss that is brought by crisis and trauma, personal strengths and gains are explored.

Teaching the mind-body-spirit connection
The relationship between spiritual wellbeing, mood and body immunity is discussed with clients. When clients know they can improve their mood by taking care of physical needs and can practise through movements, breathing or massage, a sense of mastery that can boost mental strength.

Developing an appreciation of nature
By appealing to the beauty of nature, clients are encouraged to appreciate their own life and appreciate people whom they love. Starting with the small and innocuous, and proceeding to nature and the universe. Clients are helped to develop the habit of appreciating the small things in life which slowly but steadily pulls them away from their indulgence in pain.

Facilitating cognitive reappraisal
Participants are reminded of their previous goals and dreams, their resilient experiences in facing other crises and their past achievements in an attempt to foster a sense of confidence in their capacity in dealing with the present trauma.

Nourishing social support
Effective interpersonal communication and a pleasant experience of networking can often nourish an individual's whole person development and enhance their resilience in difficult times. They are also encouraged to appreciate support from loved ones and to strengthen their social networks with family members and friends.

Promoting the compassionate helper principle
Clients are encouraged to learn from their traumatic experiences through being compassionate both to themselves and to other people. They are encouraged to become sensitive to others' needs. This can be empowering in and of itself and can move clients out of self-pity and into a path of recovery.

Chan *et al*., 2006

Narratives must be discernable to both individuals and communities through times of change as a component of the glue that holds social networks together. ‘Re-storying’ – the ability for new stories to be created, told and heard about communities and individuals in a manner salient to their histories and biographies – therefore becomes a key characteristic of communities and societies to support both individual and collective resilience.

Resilience is not the sum of its parts

As with individual level resilience, collective resilience exists within the context of a much broader set of influencing factors. At the collective level (the people, structures, interactions and transactions that occur within a place), resilience is affected but not determined by, the resilience of the individuals within it. Rather, the factors influencing resilience operate at multiple levels and collective resilience may remain wholly vulnerable to fleeting or chronic threats despite the prevalence of highly resilient individuals (Bajayo, 2010). Individual level resilience is not a proxy for resilience at the collective level and there is merit in considering the structural and environmental factors on which collective resilience depends. To this end, culture, the economy and work, leadership and governance mechanisms, and infrastructure are discussed in turn in the following sections.

Supporting collective resilience requires a shift away from deficit-based models of theory and practice, to those that are more assets-based. As Martin-Breen and Anderies (2011) argue:

“Understanding the ways in which people are already resilient, and promoting policy that supports and nurtures these endogenous capacities, can go a long way towards promoting resilience in those most at risk.” (p32)

Where supported and promoted, diversity is a positive force for collective resilience. An economy based on a variety of industries; a governance style that values multilateral leadership; and a culturally diverse population are all positive factors in terms of collective resilience. However, echoing an earlier point, while difference is of value, polarisation is associated with vulnerability.

Action at the collective level need not be based on a vision of a utopian community or city – political differences, personal struggles, lived experiences of inequality and many other difficulties will always exist for a collective and the people within it. Instead, the resilience of a collective is underpinned by values. A community that believes in participation and equality is more likely to be based on trusting relationships, allowing resilience to flourish. Where the structural circumstances of a family, community or city perpetuate poverty and deprivation, flourishing can be difficult and resilient practices are required at every turn. Crises or periods of acute stress can further weaken already vulnerable collectives and their ability to be resilient in the face of subsequent events may be lessened. Thus, underpinning all of the above, structural factors remain an important influence.

Consequently, the authors of this paper infer the following factors as vital for supporting resilience at an individual level:

- There needs to be recognition of the wider sources of resilience for individuals at the levels of community and family. These require investment.
- It must also be recognised that resilience at the level of the individual and the community are interconnected and feed-off one another, with resilience in one domain supporting resilience in the other.
- Deficit-orientated approaches should be complemented with ones that help people make crisis meaningful by using it as an opportunity for growth. This requires very different skillsets from deficit approaches, which, in public health terms, strive to return to pre-crisis conditions. A focus on individuals is central and this way of working can be time-intensive.

Beyond this, for collective resilience to be supported:

- Structural inequalities must continue to be a focus for effort. Poverty and deprivation are sources of vulnerability. While describing populations in deficit terms will undoubtedly mask the prevalence of resilient individuals, enduring resilience cannot reasonably be expected at a collective level within a population living at the sharp end of structural inequalities.
- Diversity should be supported and promoted, particularly in terms of the economy of a place and the leadership and governance models it values. Individuals' ability

supporting collective resilience.

- Opportunities for interaction that are multiple and varied help to build and, importantly, balance forms of social capital. To support collective resilience, such opportunities must be present at the most local of levels (face-to-face) as well through open communication channels linking communities to the traditional forms of leadership and governance that make decisions affecting them. Participative democracy therefore supports collective resilience.
- Action to support resilience at individual and collective levels cannot be isolated from culture, the economy, leadership and governance mechanisms, and infrastructure both locally and nationally, or from politics and struggles at a local level. The following sections focus in greater detail on promoting resilience through action in these domains.

5.1 Supporting resilience through culture

The task of understanding how resilience can be embedded within culture is guided by the idea, stated earlier, that a resilient community is *"one that has a collectively held belief in their ability to adapt and thrive in spite of adversity*" (Mguni and Caistor-Arendar 2012; p5). The same also holds true at the level of the individual, and is supported when a culture facilitates and values the sources and processes of resilience. In this section we explore culture in both its broad, anthropological sense and the narrower sense of cultural participation and consumption.

In its broader sense, culture contains collectively held values, expectations and norms useful for coping, adaptation and survival (Thompson, 1969). Still, some stories around individuals or communities can become inflexible, stigmatising and can obstruct adaptation to challenge and changing circumstances. Research around the facilitators of resilience within communities of migrants (see Castro and Murray, 2010), as previously discussed, is instructive for the resilience of all, if migration is understood as a metaphor for changing societal circumstances. This metaphor has been

invoked in relation to cultural change in the idea of digital ‘natives’ and ‘immigrants’ (for illustration see Jones and Shao 2011). The ‘immigrants’ are those who have been required to adapt to changing circumstances, discontinuities in established forms of interaction and service access coupled with new forms of opportunity. ‘Natives’ have only known life since the transition.

Other societal transitions will produce versions of migrant and native, such as shifts in the nature of the economic base (e.g. industrial to service) or transitions from carbon-based economies to greener ones. In spatial migration, migrants who participate both in the community of their host culture and maintain their native heritage tend to exhibit resilience (Berry, 2005). Narratives must adapt to change but need also to maintain a degree of foundation in existing forms of meaning-making, cultural assets and resources for coping (Zautra *et al*., 2010). Therefore, cultures that support resilience allow change and diversity while supporting existing elements that assist coping and survival. Avoiding polarisation and stigma within this diversity of outlooks should also be paramount. This particular point is discussed further in section 5.3 below which focuses on leadership and governance.

Culture must achieve various ends to support resilient individuals and communities, including building a collective sense of coherence that in turn creates social solidarity. In doing so, the plurality and diversity that supports adaptability must also be recognised. Space for successful adaptation and change should also be allowed; a culture that is too static can lead to rigidity in the responses and practices of a community. New stories must be allowed to emerge and existing narratives reinterpreted for changed circumstances. It is here that we find the role for culture in the narrower sense of participation and consumption – as the generator of narratives of change and adaptability but also in providing a space for a diversity of perspectives to be expressed and understood.

The ways in which arts and culture have been funded in the UK in recent years has seen greater support for that which promises benefits aligning with

the priorities of government. Such benefits include health, community regeneration or wider economic benefits and international positioning to attract tourism and investment. Holden (2004) describes this justification for cultural funding as ‘weak’ and calls for a ‘strong’ definition where cultural production and participation is confident of its own worth and is not dismissed as ‘art for art’s sake’. Holden writes that in the ‘weak’ position *“unintentionally, these pressures will institutionalise cultural mediocrity by encouraging both funders and funded to take safe bets”* (p21). This ‘weak’ position tends to conceptualise the benefits of cultural participation through other variables such as social contact. Furthermore, research into forms of cultural participation devoid of physical activity or social contact show culture as a variable for health in and of itself (Glass *et al*., 1999; Jacobs *et al*., 2008).

Although the improved health and wellbeing of individuals is indeed an asset for the resilience of their larger communities, cultural participation can also build community cohesion and social capital, highlighting its efficacy across multiple dimensions of resilience (Matarasso, 1997).

To understand how cultural production and participation fosters community resilience, the language of asset-based approaches is helpful. Cultural participation and production assist the development of ‘intangible’ assets as well as the ‘tangible’ assets that lend themselves well to empirical measurement – physical resources, financial assets and credit, human capitals of education and health, environmental and natural resources (Moser, 2009). Burnell (2013) writes: *“…dreams, hopes and ambitions can be defined as intangible assets… [they] embody important human, cultural and social capital essential to building resilience …cultural action expressed through the arts can assist in unlocking these.”* (p139).

Matarasso (1997) also describes how engagement in cultural practice can improve people’s identification and engagement with place, leading to the development of social capital and a commitment to address social problems. Minority perspectives can also be heard. At an individual level, confidence and skills can be improved, developing stocks of ‘human capital’. Local cultural

participation can support the creation of a critical mass of common purpose and capacity and form community from individuals.

The caveat applied to resilience perspectives more generally also applies here – community level cultural participation and production alone cannot resolve complex social problems, particularly those experienced by disadvantaged groups. Capturing multiple insights and bringing perspectives inside the frame of policy-makers and community members does become possible, however. When cultural production is not owned by experts and professionals but allows the release of a community's creativity and capacity, this potential is greater.

Resilience requires the ability to respond and make meaning in dynamic circumstances. Culture is *"constantly recreated as people question, adapt and redefine their values and practices to changing realities and exchange ideas"* (Burnell, 2013; p143). Cultural production and participation allow broader cultures to maintain their openness, thereby providing opportunities for the stories, skills and resources to emerge that can support transformation when required.

The following positions facilitate the alignment of culture and resilience perspectives.

- Cultural participation should include recognition of the need for individuals to be producers as well as consumers of cultural output. Creating such opportunities is health-promoting in and of itself but, further, allows multiple perspectives to emerge, leading to the formation of new meanings, practices and responses to changing circumstances. Broadening the scope of culture to include elements of 'everyday practice' and forms of content generation made possible through new media will also be required.
- Recognising the importance of, and supporting, small-scale, place-based activities is essential for building the shared meaning that unifies communities and supports those assets which facilitate resilience for individuals and their communities.
- Although culture has a role to play in the production of tangible outcomes such as health, economic benefit and employment, the less measurable, intrinsic values of culture and cultural participation should be given equal weight with 'tangible' or measurable policy outcomes. For resilience, both 'weak' and 'strong' justifications of cultural production and participation are necessary and complementary.
- Policy-makers should recognise cultural participation as essential for healthy communities but also as a means of 'putting into the frame' a diversity of perspectives, challenges and responses from different sections of a community. In this sense, cultural participation can make a contribution to participatory democracy as well as contributing to resilience.

5.2 Supporting resilience through the economy and work

Given that the origins of resilience lie in developmental psychology (Hill *et al*., 2007) the relationship between the economy and the promotion of individual resilience has suffered a thinness of investigation. Where the concept of resilience has been applied, it has tended to focus on the strength and resistance of the economy itself, rather than the impact of economic activity on the resilience of individuals. However, there is literature that investigates the relationship between work and wellbeing which, for the current purposes, is an enabling component of individual resilience, particularly when psychosocial aspects are considered (Harkins and Egan, 2013).

Examples of studies of the resilience of economies include Bruguglio *et al*., (2004) who cite factors such as having a flexible and multi-skilled workforce and low unemployment as building economic resilience, particularly in small nations exposed to shocks from outside their borders and beyond their control. Diversification of an economy and a low ratio of international trade to Gross Domestic Product (GDP) are also cited. Diversification allows flexibility if sources of previous trade and prosperity discontinue. Thus, buoyant economies may not be resilient if they are over-reliant on one form of economic activity.

Other economists are critical of using GDP as a means of establishing collective resilience however. The relationship between GDP and life expectancy displays diminishing improvements after a threshold of around £15,000 per adult (Wilkinson, 1996). The relationship between GDP and wellbeing reveals a similar pattern (Wilkinson and Pickett, 2009). Viewing resilience from the perspective of the economy, rather than those the economy serves, has led to calls to rethink the dominance of GDP as a measure of success and outcome measure of resilience. Jackson (2009) suggests redefining prosperity as an ability to flourish in ways that incorporate meaning, purpose and participation in society in more psychologically satisfying ways than consumer society has generated. The Oxfam Humankind Index (2012) developed example indicators to assess progress including

affordable, decent and safe homes, physical and mental health, a clean, accessible environment and satisfying work. Jackson's call for redefinition to be achieved within the ecological limits of the planet highlights a potential synergy between environmental, individual and collective resilience (Jackson, 2009).

As oil prices increase and climate change continues to impact upon food security, more localised forms of economic activity may become increasingly common. The rationale for localism is twofold; that economic activity can reap common local benefits – through supporting local economies – and that global environmental benefits can be achieved though exercising more sustainable forms of living (Curtis, 2003). The adoption of local currencies has the potential to provide a degree of protection from the negative effects of globalisation and in some instances has sparked social and economic regeneration within communities (Pacione, 2011). Localism has also been cited as a potential path towards greater equality and the fairer distribution of wealth and resources. This could be considered to be an example of small scale transformational change, demonstrating that it is possible for alternative modes of living to emerge alongside mainstream practice.

Researchers who have explored the relationships between work and individual health and wellbeing provide some indications of which elements might feature in an economy which promotes individual and collective resilience. A dominant perspective is that the economy is a provider of opportunity through employment which establishes the material and psychosocial conditions in which individual resilience is maintained or compromised. Further, policy-makers tend to concur that work has a positive effect on individual health and wellbeing and that it can reverse the ill-effects of long-term unemployment (Black, 2008). In the seminal review of evidence *'Is Work Good For Your Health and Wellbeing?'* Waddell and Burton (2006) outlined work as vital for the material resources for participation in society, for psychosocial health and in the formation of social identity and status. Unemployment conversely was associated with higher mortality, greater

longstanding ill-health, poorer mental health and contact with medical services and hospitalisation.

The status and prestige dimensions of work however, point to possible stressors to wellbeing and identity that can stem from employment. Consequently, focus on the quality as well as the quantity of work is required to understand its relationship with resilience. Ezzy (1993) for example, describes the relationship between employment status and mental health outcomes as complex and subtle. For most, job loss or worklessness will produce lowered wellbeing; however, a substantial minority will experience improvement. Similarly, while re-employment typically restores mental health, some will report a decline.

These instances of decreased wellbeing following re-employment, though not the most common outcome, highlight the need to understand the types of work and personal circumstances that mediate negative or positive outcomes in relation to employment.

The role of personal meaning construction (Jahoda, 1988) through work echoes the concept of ‘forward lean’ identified earlier in this paper. The functions of employment go beyond the ability to meet financial and material needs. ‘Latent’ functions of employment include providing time structure, shared experiences and contacts, links to purposes beyond one’s own (transcendence), personal status and identity and activity. Similarly, Warr (1987) constructed a ‘vitamin’ model of employment to highlight nine features that support positive mental health:

- opportunity for control
- opportunity for skill use
- externally generated goals
- variety
- environmental clarity
- availability of money
- physical security
- opportunity for interpersonal contact
- valued social position.

These models are instructive when compared with contemporary policy responses to dealing with worklessness. ‘Making work pay’ has been a rallying call for welfare reform, as has the removal of the ‘poverty trap’, whereby the gains of paid employment are, at best, marginal compared with claiming welfare benefits. This has the appearance of a rationalistic explanation for why people choose not to engage in the labour market. However, the introduction of latent functions of work (paid or un-paid) should lead to attempts to address the non-financial value of work and quality of work offered. This can include addressing elements of available work that may reduce work as a foundation for wellbeing and identity, in creating forms of precariousness in material and psychosocial conditions (Sennett 1998; Standing 2011).

An illustration comes from research conducted by the GCPH (during a time of more buoyant economic conditions) exploring the experiences and perspectives of people in marginal labour market positions. Those interviewed spoke of their experiences of the cyclical nature of employment and unemployment. Their experiences framed reasons why claiming benefits was preferable to paid work. Many experiences of work were considered demeaning or psychologically injurious (GCPH, 2008). In short, worklessness as 'choice' was influenced by an assessment of the non-material and identity-orientated dimensions of both paid and non-paid work: for example, when paid work interrupted a personal narrative of being a 'good' and available parent.

However, work can provide important means of improving the health and wellbeing of both individuals and society specifically when attention is given to the latent qualities of the roles our economy provides. Employment should not over-burden workers, it should provide a degree of control, autonomy and decision-making and improve the creation and access to social capital (Brinkley *et al*., 2010). In a knowledge economy such characteristics are more likely to be associated with higher value economic activity and of flexible and diverse roles. However, there remain issues around whether roles in higher value industries, even those at low paid entry level, are accessible to all.

Warhurst's (2011) discussion of 'good' and 'bad' jobs in Glasgow highlights two interdependent tiers of work being created in the city; prestigious and well-paid jobs in the creative and knowledge industries and 'service class' jobs in hospitality and retail which support the lifestyles of the creative/knowledge workers. There is an inherent competitive disadvantage for those who have been outside the workforce for a number of years and who lack the connections and cultural capital necessary to obtain meaningful work in the new economy, even in low paid positions. Warhurst suggests welfare policies that support those returning to work with available childcare as key to ensuring equal access to higher quality work. An informal system of like-recruiting-like in such industries, often through periods of unpaid internship, also needs to be addressed. What remains crucial is that flexibility to maintain

the resilience of the economy is achieved in a manner which does not undermine the viability of individual wellbeing and the psychosocial conditions of work.

From this brief exploration of the relationship between the economy, work and resilience we develop the understanding of resilience accordingly:

- The resilience of the economy and the individuals within it are interconnected. Forms of employment growth need to take account of the qualities of work required for individual wellbeing if work is to 'pay' in psychosocial terms. In such circumstances, employee resilience as a product of improved health, wellbeing, autonomy and commitment to the idea of work is more likely. Having an adaptable, autonomous workforce is more likely to benefit the economy in times of discontinuity.
- Resilient societies will value and support forms of employment that offer a diversity of purposes and narratives to be pursued by individual workers. Furthermore, an adaptable and 'multi-skilled workforce' will in turn offer resilience to the economy.
- As well as paid work, community activity and work in the 'hidden economy' (forms of labour that produce economic benefit but are unpaid) require recognition as valuable economic activity and should be assisted through working practices supporting family and community life and by paying living wages.
- Economic regeneration and stimuli should focus on the quality of work as well as its quantity.
- The narrative perspective and role for 'forward lean' in producing health and wellbeing for workers highlights a place for lifelong learning and training to encourage diversity and adaptability. Again, this will promote the resilience of the economy through supporting adaptability and releasing skills and abilities in the workforce.

5.3 Supporting resilience through leadership and governance

Within communities lie a multitude of skills, local knowledge and social networks. Commonly, these assets represent untapped potential. During crises, local emergency services are often overstretched and fragile. At such times citizen activity often complements the work of frontline services (Edwards, 2009). This is particularly the case when centrally-planned infrastructure fails to deal with unanticipated problems. The task for leadership is to provide the conditions through which these networks are sustained and nurtured pre-crisis and are given the authority and confidence to mobilise in times of crisis.

"As the floodwater snaked its way down and across our State, politicians were forced to focus on local collectives. They attended local community meetings and used local forms of transportation. They relied on social networks and social media to spread information. They sought local knowledge or expertise and witnessed firsthand the different 'ways of being' that characterised different places. In some communities, they were also personally affected by floodwaters, helping and being helped alongside people they may not have otherwise met."

(Kendall *et al*., 2011; p522)

Kendall *et al*. describe above the response to severe flooding in the Australian State of Queensland. They highlight how textured and localised understanding of the 'ways of being' in local communities shape understanding not only of unrealised capacity for bouncing back to normal, but also of what normal in local terms may look like. Kendall *et al*. go on to ask: *"What will be the effect of this experience on future policy-making? Could it mean a renewed focus on the promotion of strategies to build and support local capacity?"* (Kendal *et al*., 2011; p522)

There is an increasing recognition that while traditional, top-down governmental systems of control are necessary in order to support our demands and expectations in a complex global society (consider the international accomplishment that is our food chain) these are inherently

‘brittle’ and vulnerable to crisis. It is in times of crisis that their brittle nature is revealed. Although the causes of crisis may be global and the result of structures or processes beyond local control, emergencies are experienced as local problems, with local people responding while infrastructure – the roads, railways, schools and utility supplies – are reconnected.

Planning for resilience tends to focus on catastrophic events and emergencies. For example, the UK Cabinet Office National Risk Register of Civil Emergencies (2013) highlights risks from attacks on transport and data systems, pandemic influenza, extreme weather, volcanic disruption, public disorder and industrial action as the emergency-producing events with the highest likelihood of occurrence. Many of the problems that face us however, are less tied to occasional catastrophic events and are more about longer-term changes, which challenge established patterns of life. To take Glasgow’s history, shifts in the international division of labour coupled with unfavourable political winds undermined a system of day-to-day normality that previously supported how people earned a living, organised communities and understood their roles and life-course. Rather than an isolated event for which well-drilled and organised emergency services could respond to assure a return to ‘business as usual’, it was the idea of business-as-usual itself which was gradually and incrementally dismantled. Similarly, a threat such as climate change is not only associated with immediate impact events such as flooding which, after a period of disruption, can see a return to pre-crisis conditions, but more long-term, gradually unfolding challenges that undermine the taken-for-granted conditions underpinning an economy, society and culture.

To such challenges, leadership that promotes adaptability is associated with resilience. Walker and Salt (2006) discuss resilience in terms of ‘building adaptability’ citing a crucial role of leadership. Ostrom has also written widely on the subject of what she terms ‘adaptive governance’, and has produced a set of design principles to foster resilient collectives (1992). These are philosophically aligned with asset-based approaches and describe leadership that values diversity, participation, and collectivism to foster resilience at

individual and collective levels (Olsson *et al*., 2006). Devolution of this kind, crucially, begins with a mindset in which efficiency is valued secondary to collaborative, flexible, learning-based approaches.

A traditional pyramid model of leadership, with few leaders and many followers, precludes opportunities for non-traditional leaders to emerge: *"…those who take decisions in the usual place, surrounded by the usual people are highly unlikely to give us the unusual"* (Morse, 2004; p204). Instead, a 'plaza' model is *"open, inviting opportunities to put the whole community to work for the community"* (Morse, 2004; p204). Thus, promoting resilience requires a broader system approach that includes leaders across any, and all, levels – *"…someone (anyone) who steps forward to take initiative with the support of local people"* (Wilding, 2011 p12).

Flattened leadership models have the potential to increase capacity to learn from, respond to and manage vulnerabilities in communities and cities. However, this potential is only likely to be realised if trust is abundant. Lebel *et al*. (2006, cited in Martin-Breen and Aderies, 2011) argue that participation is required to build trust and shared understanding as a precursor for further mobilisation and self-organisation.

A culture of learning has been cited as a valuable personal and collective resource that can bring about long-lasting health benefits, as well as helping people to develop the skills and mindset to respond positively in times of adversity (see also section 5.2 on the economy and work). A substantial body of literature supports the notion that education and lifelong learning are important for wellbeing, personal development and other components of resilience such as self-efficacy, self-esteem, hope and coping in adversity (Shuller *et al*., 2002; Feinstein and Hammond 2004; Hammond, 2004) but can also bring wider societal benefits through increased community involvement (Sabates, 2008). This is an important point in relation to resilience, as in times of complexity and uncertainty; ingenuity and social capital become increasingly important. Close links to this paper's earlier discussion about the relationship between culture and resilience are evident here.

"Instead of the need for gatekeepers in communities or in key positions in organisations of any size, the leadership role becomes one of enabling collective innovation through many personal actions focused in favour of collective goals."

(Wilding, 2011; p26)

Identifying issues that move the communities can be an important first step in allowing leaders at the highest organisational levels to find common ground with emergent community leaders, and to collectively vision, aspire and act with a common purpose in mind. This is not to say that commonality is key. Rather, diversity of skills, roles, experiences and opinion are valued where, as alluded to earlier in this paper, *"…differences are good; polarization is bad"* (Olsson *et al*., 2006; p16).

Expectations of traditional leaders can act as a barrier to change – what do communities or cities ask of their leaders and how do they respond if their leaders fail to deliver (Morse, 2004; Edwards, 2009)? If a community that provides the mandate for leadership does not tolerate risk-taking and is too punitive of failure, then leaders may play safe and innovation will be stifled.

"If a population… is likely to react harshly, and negatively, to what otherwise would be the best management decision, making it impossible to implement, then ultimately this would be the wrong decision."

(Martin-Breen and Anderies, 2011; p55)

The caveat here, of course, is that a community which places little value on participative leadership and shared responsibility will result in a disempowered population, unable to influence future decision-making. The value placed on participation can shape the competence of the communities involved. Self-governance is found most readily in affluent, well-educated communities (Kendall *et al*., 2011) and so the issue of 'community competence' arises. It has been argued those communities that are most vulnerable and have suffered oppression have limited opportunities for meaningful engagement – sense of belonging may be weak and activities and interactions not well

promoted (Edwards, 2009; Sonn and Fisher, 1998). These communities may require support and reassurance to participate meaningfully, thereby building the trust and shared understanding needed to mobilise emergent leaders and develop a more resilient community. Contrary to this, are examples of communities utilising challenge as a mobilising spur for participation.

Clearly, one cannot separate issues from the context in which they occur. Community and city-level systems are nested within higher-level authority models and national governance structures. Therefore, adopting an outward-looking focus has merit in building resilient communities (Morse 2004; Martin-Breen and Aderies, 2011). Making links between the big picture and day-to-day needs at a collective level can prove difficult, however. It is unlikely that individual leaders will span these domains and so a multilateral approach involving a network of leaders at various levels, from local to higher organisational, will be most beneficial.

Having successfully encouraged a sense of collective endeavour, and established trust among a network of multilateral leaders, the temptation to formalise organisations and structures can introduce vulnerabilities. Individual and collective power and responsibility are diminished by contriving the process of developing leaders (Edwards, 2009). The process *"can only be navigated, not planned"* (Olsson *et al*., 2006; p11) and while new structures will be important to link individuals and organisations at multiple levels, in an adaptive governance system these will emerge and remain flexible.
Timing and opportunity may play a role in moving to more adaptive governance models and in determining the likely impact of such shifts. During and after a period of difficulty or crisis the predominant social norms and rules loosen allowing people to perform acts or step into roles that they may not otherwise have the opportunity to. 'Shadow networks' can be an emergent resource – groups that are willing to generate alternative solutions; *"incubators for new approaches to governing"* (Olsson *et al*., 2006; p12). People in these networks are not usually constrained by organisational structures and/or rules, and have the freedom to think and act differently. These groups play a crucial role as drivers of ingenuity and creativity;

promoting experimentation, learning and innovation are essential to building resilience. Where small failures are tolerated and viewed as useful learning, resilience is able to flourish.

A greater level of mutuality in leadership and governance can both hasten the abandonment of undesired trajectories and build momentum to move in new, desirable directions – if this shift in the balance of power is allowed to happen. At the collective level, governance for resilient communities will allow alternative trajectories to emerge in parallel with the transformational capacity that characterises resilience across the other domains in this paper.

It is therefore inferred that both national and local governance and leadership for resilience:

- Concentrates not only on disaster planning but nurtures the potential in local 'ways of being' that can provide the alternative trajectories if current development or regeneration narratives are forced to change.
- Fosters diversity and allows spaces for different styles of governance, mindset and community to flourish.
- Is participative and promotes devolved decision-making.
- Is set within a culture that tolerates small failures when learning is produced as a result. This tolerance should be shared by those who hold leadership structures to account such as the electorate and the media.
- Understandings of efficiency are not based on short-term cost effectiveness but take account of the longer term benefits.
- Operates on multiple timeframes which go beyond electoral cycles or financial years. Such time perspectives may include conceptions of historical time that take account of climate change, resource depletion and transfer of intergenerational commons.

5.4 Supporting resilience through infrastructure

Infrastructure as *"the basic physical and organisational structures and facilities needed for the operation of society or enterprise"* (Oxford English Dictionary, 2013) includes the services, facilities, utilities and communication systems, as well as the public institutions required for society to meet daily needs. Although seen as a necessary foundation for economic growth (HM Treasury, 2011), with the presence of high-quality infrastructure an indication of a nation's development, its unequal distribution is associated with inequalities in health (Marmot and Wilkinson, 2006). Here we consider infrastructure to be the physical structures which enable society to meet basic needs as well as those which facilitate progressive social activity. Infrastructure, therefore, is important to the successful functioning and adaptive capacity of places and the people occupying these spaces.

The significance of infrastructure to people, beyond meeting their basic everyday needs, stems from its capacity to bind and connect. At a community level, good quality infrastructure can enhance opportunities for social activity and enable people to improve the quality of their lives. In the context of improving or maintaining health and wellbeing, hospitals, schools, community facilities, transport networks and public spaces are relevant forms of infrastructure. Yet these also have a role in connecting communities and producing and mediating access to social capital. Understanding resilience in relation to infrastructure therefore is twofold: firstly; the resilience of the infrastructure itself to shocks, anticipated or unanticipated to allow a return to 'business as usual'; and secondly, the manner by which infrastructure supports the sources of adaptation and transformation required for resilience to develop within communities.

Resilient infrastructure

The organisation of critical infrastructure requires constant monitoring and diligence in terms of identifying, understanding and reducing the potency of the hazards which threaten its functioning or long-term sustainability (UK Cabinet Office, 2013). Increasingly, organisations and their networks are being challenged on their ability to absorb shocks and recover. Although examples of infrastructure collapse remain rare, as scale and complexity increases, inherent interdependency brings about the potential for failure in one part of a system to impact upon others (Boin *et al*., 2007). At a macro scale, infrastructure protection requires long-term thinking, in terms of identifying possible threats to functioning and to the emerging trends which may place additional pressure on it (Parliamentary Office of Science and Technology, 2010).

In the UK, population growth is arguably a concern, with continued rises expected to place increasing pressure on the nation's water infrastructure (Institute of Civil Engineers, 2012) and housing sector (Findlay *et al*., 2012). In addition, UK infrastructure is facing new challenges in meeting the needs of an elderly population, as well as providing the necessary requirements to mitigate and respond to climate change. All of this is adding pressure to an already complex and potentially fragile system.

In current UK government thinking, fostering a resilient infrastructure is dependent on co-ordinated action to ensure it has the capacity to meet four key components; 'resistance', 'reliability', 'redundancy' and 'response and recovery' (UK Cabinet Office, 2013). Resistance, here, is the means through which systems can be protected. Reliability refers to the adaptability of infrastructure and the ability to function under a range of different conditions. Redundancy is the availability of back-up functions, and response and recovery concerns the ability of systems and services to provide fast and effective responses to threats.

In this context of emergency planning, infrastructure is largely accounted for in terms of its ability to withstand stress and cope in the aftermath. Future infrastructure provision will need to achieve this, while ensuring that the chance of future episodes are minimised and everyday living conditions improve. This is likely to involve a period of transition, as outdated forms of infrastructure are replaced by necessary post-carbon[d] forms of living.

The process of change will differ greatly from place to place, with those investing in sustainable infrastructure at an early stage being well-placed to respond to the future challenges of climate change and peak oil (Newman *et al*., 2004). Indeed, places that have already invested in sustainable infrastructure, such as those providing a viable alternative to motorised travel, frequently score highly in quality of life indexes.

Resilient communities

A city or region may be described as being resilient where known risks have been considered and mitigated and where there is sufficient ingenuity and capacity to cope in times of unexpected adversity (Newman *et al*., 2009). Despite what is known about how to develop successful or resilient places, they cannot be created easily through centralised planning or the provision of generic infrastructure and amenities. Such an assumption would fail to acknowledge the varying characteristics of places, the functions they provide, as well as the diverse range of threats to which they are vulnerable. In the face of growing uncertainty around climate change, peak oil and economic uncertainty, flexibility and the availability of alternative infrastructure accords increasing importance. In such a context, infrastructure is required to support the transformational and adaptable capacity of individuals and communities without creating new vulnerabilities.

[d] Post-carbon living is characterised by resilient communities and re-localised economies that thrive within ecological bounds.

Infrastructure in communities is increasingly being considered in terms of the physical structures which facilitate social activity within places (Dobson, 2011). Social infrastructure is described as "*the range of activities, organisations and facilities supporting the formation and maintenance of social relationships in the community"* (Future Communities, 2013). The presence of social infrastructure can enable community networks to develop, building the social capital which is necessary for resilient community responses in the face of changing local circumstances (Department for Communities and Local Government, 2006). Here, the future role of community high streets is a worthy example. In 2011, the UK government considered the decline of high streets serious enough to commission an independent review on their future (Portas, 2011). Among other things, the review suggests that high streets of the future will need to become more than just places for shopping, but equally as social spaces and places created by, and belonging to, local people. The 2013 report of the Scottish Government's review of town centres echoes this sentiment (Scottish Government, 2013). These findings mirror some of the proposals put forward by the New Economic Foundation (Cox *et al*., 2010) which advocate more economically diverse high streets which better reflect local characteristics, and which encourage more sustainable and adaptable activity.

The resilience of individuals and communities is often tested in the face of disruptive events which threaten or damage the functioning of infrastructure. As already stated, resilience is often said to come to the fore in times of crisis and disruption. This raises the question around whether or not the presence of infrastructure is necessary for resilience to emerge. As has been seen in many cases, empathy and resolve can become most apparent when everyday amenities are removed and people are only able to draw upon their internal resources. Although there is evidence to support this, recent disasters in places that are well resourced and prepared to cope during periods of adversity or crisis – such as Japan – have suffered fewer long-lasting impacts. Infrastructure is therefore important, as responding during a crisis demands preparedness and the availability of organised assistance. In the context of resource depletion and climate change, countries that are well prepared have

a better chance of recovering from shocks by drawing on human ingenuity, having responsive emergency services and by using adaptable forms of community infrastructure to meet emerging shortfalls, while those that do not, face increased risk (United Nations Framework Convention on Climate Change, 2011). A resilient infrastructure, therefore, can enable communities to bounce back and transform in the face of adversity, rather than to simply endure and recover.

As with the distinction between a resilient economy and an economy which supports resilience in individuals, the relationship between resilient infrastructure and resilient people and places is nuanced. Discussion of the UK government's use of infrastructure investment as an economic stimulus has focused on a large-scale infrastructure project – a second high speed rail line – rather than a focus on the types of investment which might support the formation of resilient communities. In the current financial climate, investment in large-scale infrastructure has formed part of the response towards global economic recovery, rationalised on the basis that large-scale public investments can provide the catalyst for further investment and economic growth (United Nations Environment Programme, 2013). Improved connectivity and the creation of jobs enable the flow of goods and services more freely. Expanding the reach of markets, and providing a modern productive infrastructure are considered to be necessary components for achieving regional economic resilience and competitiveness (Wolfe 2010; Christopherson *et al*., 2010). However, the stimulation of economic growth per se does not necessarily lead to resilient people and places, as discussed in section 5.2.

At the local level, high quality urban design and inclusive placemaking – working with local people to create distinctive places – can assist in creating places of character which enable people of all ages to meet their daily needs (Scottish Government, 2010). To achieve this, places need quality infrastructure to enable the social, cultural and economic activity necessary for communities to become cohesive and resilient. In the context of fostering a more resilient and healthy society, green infrastructure has been promoted for protecting against climate change, supporting biodiversity, economic growth

and the promotion of improved physical and mental wellbeing (Forest Research, 2010). Taking this notion further, the concept of an integrated green infrastructure has been developed along the lines that the provision of greenspace can be delivered as part of a wider process of integrating and connecting other forms of infrastructure such as sustainable drainage systems, wetlands, local food production and active travel routes (Scottish Government, 2011). Of course the design of places in providing a positive social function is not new, with seminal authors such as Jacobs (1961) and Appleyard (1980) paving the way for improving understanding around the role of public spaces in building social capital.

Infrastructure provision is important across a range of different scales. When integrated with the natural environment and in keeping with the existing built environment, it serves an important function of connecting people and places, providing a strong community focus which supports the types of activity required to release capacity for transformation.

Key issues in terms of the relationship between infrastructure and resilience are below:

- Physical infrastructure at a community scale (adequate transport, community spaces and adaptable community facilities) is important for building social capital.
- Good quality infrastructure is also important for economic activity, as it provides greater access to jobs and can help to attract investment. The equitable distribution of infrastructure can increase opportunities for all people to access employment and ensure the economic resilience of regions.
- Infrastructure is facing increasing pressure from external factors such as population growth, climate change, terrorism and shifting demographic patterns. This demands that increased attention is accorded to its ability to absorb shocks and provide adequate back up functions.
- Places with a range of infrastructural options reduce the likelihood of disruption when one form of infrastructure is placed under pressure.
- Social infrastructure – that which facilitates social activity – is important during periods of 'business as usual' and in 'crisis'. The presence of social infrastructure can help to build community cohesion, which is important for responding to crisis.
- Community infrastructure should enable people of all ages to meet their daily needs and should be flexible enough to adapt to changing circumstances and provide a supportive social function in times of community need.
- Green infrastructure, such as linked greenspace, can play an important role in increasing opportunities for socialising, improving mental wellbeing and supporting biodiversity.
- Sustainable infrastructure, such as active travel provision, eco-friendly design and energy efficient buildings should be prioritised within cities as part of a concerted effort to move towards post-carbon living and transforming the way in which communities function.

6. Measurement of resilience

The following section considers the measurement of resilience as a means of assisting practitioners and policy-makers in tracking the progress of activities designed to enhance and support resilience or to identify the presence or absence of these resources. The discussion focuses on measures and scales that allow consideration of resilience at the level of individuals and communities. At the city or regional scale, resilient practice has generally been considered in relation to a set of principles or indicators which have been deemed relevant to the resilience of a place. Resilience here is primarily concerned with how the different facets of places combine and interact to shape its functioning. Thus, the focus is on the factors which influence, and are influenced by, the actions of populations rather than of individuals. At this scale, finding a consistent measure of resilience becomes more problematic, as discussed in Section 4 on 'collective resilience'.

Measuring the resilience of individuals

The measurement of individual resilience has largely been framed around assessing the personal characteristics, attributes, attitudes, relationships and behaviours and available resources. At this level, a number of scales are available (see Appendix 1). These scales vary in terms of their length and format, whom they have been developed for, the mental functions and social behaviours related to resilience they aim to assess and measure, and in the number of domains and items they contain. However, in a recent review of individual level resilience measurement scales (Windle *et al*., 2011) all were reported to have missing information in relation to psychometric or mental function properties. When considering all of the quality criteria for each identified scale, the questionnaires were reported to be of only 'moderate' quality. Recognising that a number of these scales are in the early stages of development and require further validation work, it remains that no current 'gold standard' resilience measure appears to be available at present.

Methodological reviews aim to identify, compare and critically assess the validity and properties of conceptually similar scales and make

recommendations about the most appropriate use for a specific population, intervention or outcome. There is currently no single scale that appears to be more widely applicable than the others (Connor and Davidson, 2003; Windle *et al*., 2011; Smith-Osborne and Whitehall Bolton, 2013) and this has added a complication in the need to reflect heterogeneity across populations in choice of measures.

While a strong sense of personal agency is important for negotiating adversity, the availability of resources from the level of the family and community are also key (Windle *et al*., 2011). A number of measures aim to examine the resilience of the individual across multiple levels (individual, family, and school community).
Examples include:

- the Resilience Scale for Adults (Friborg *et al*., 2003)
- the Connor-Davidson Resilience Scale (Connor and Davidson, 2003)
- the Child and Youth Resilience Measure (CYRM) (Ungar *et al*., 2008)
- the Resilience Scale of the California Healthy Kids Survey (Sun and Stewart, 2007)
- the Resilience Scale for Adolescents (READ) (Hjemdal *et al*., 2003)
- the Youth Resiliency: Assessing Developmental Strengths Scale (YR:ADS) (Donnon *et al*., 2003, Donnon and Hammond, 2007).

The development of measurement instruments capable of assessing a range of protective mechanisms within multiple domains provides an approach that operationalises resilience as a dynamic process of adaptation to adversity (Olsson *et al*., 2003). Measures of resilience should, ideally, be able to reflect the inherent complexity. However, only one measure, the Brief Resilience Scale (Smith *et al*., 2008), recognises the availability of assets and resources that facilitate resilience. This scale may therefore be useful for measuring the process leading to a resilient outcome, or most suitable for those who are interested in ascertaining the presence or absence of these resources.

As the universally accepted factors underlying resilience can be perceived differently by different individuals (Ungar *et al*., 2008), a good questionnaire should seek to minimise situational effects (Windle *et al*., 2011). The setting and circumstances in which a measurement scale or questionnaire is administered therefore plays an important role. Many existing resilience measures have been developed to meet the needs of specific population groups. Consideration of the cultural appropriateness of a measure is required.

The scales and measures highlighted here have been created for use with specific target audiences and have been developed in various locations across the world. One scale in particular, the Child and Youth Resilience Measure, despite receiving extensive development and multi-national piloting remains uncertain in terms of cross-cultural comparisons, with the authors concluding that *"definitions of resilience are ambiguous when viewed across cultures"* (Ungar *et al*., 2008; p174). This may be unsurprising given that critics of individual resilience, discussed in Section 3, highlight the cultural specificity of resilience in terms of its contents and outcomes.

Quality considerations of individual resilience measures

It is best evaluation practice to ensure interventions and policies designed to promote resilience use reliable and valid measures (Windle *et al*., 2011; Smith-Osborne and Whitehall Bolton, 2013). However, different approaches to measuring resilience across studies have led to inconsistencies relating to the nature of potential risk factors and protective factors and in estimates of resilience prevalence. In a review of the childhood resilience literature, Vanderbilt-Adriance and Shaw (2008) report that the proportions found to be resilient varied from 25-84% in comparable populations when using the same resilience measure. This creates difficulty in comparing prevalence across studies, even if study populations have experienced similar adversities (Vanderbilt-Adriance and Shaw, 2008). This diversity also raises questions about the extent to which researchers are measuring resilience, or an entirely different experience (Windle *et al*., 2011).

Validation processes are designed to safeguard that scales accurately measure what they aim to, regardless of who responds, when they respond and to whom they respond (Terwee *et al*., 2007). The validation procedure should establish the range of reasons for inaccuracies and potential sources of bias. What makes validation difficult in the measurement of resilience responses is how the response itself is shaped by the dynamic circumstances of context. Different contexts and the environmental supports for transformation and adaptation shape what kinds of outcomes are possible through an individual's creative engagement with their circumstances. The Realistic Evaluation approach (Pawson and Tilley, 1997) brings context into the understanding of how outcomes are established and can help unpick the processes which underpin the demonstration of resilience.

The measurement of collective resilience at a community level

Complexity creates a challenge for measuring resilience at the community level. Community resilience involves the interaction of individuals, families, groups and the environment and is influenced by a wide range of factors that may promote, represent or threaten resilience in diverse community settings. Challenges in measuring the 'general resilience' in a population or community can include a focus on assets and vulnerabilities that may be unknown, missed or extremely difficult to measure. Consideration of community resilience also brings into focus the individuals who constitute a community, the informal community leaders, the formal and informal networks, and the hierarchies that exist at different levels within the local area (Mguni and Caistor-Arendar, 2012). Considering resilience within a community setting raises two key questions: firstly, what assets exist, and secondly, what are the catalysts that mobilise these assets?

Identifying resilience at a community level involves uncovering strengths, including organic networks and activism, as well as vulnerabilities, such as social isolation, in order to see a community in its totality. Indicators associated with resilience are often left uncovered by traditional forms of measurement and some initiatives and their outcomes will not be readily

captured by traditional measurement tools (e.g. surveys, interviews). Alternative approaches such as observation or ethnography allow the world to be observed from the point of view of those being studied and aim to capture the realities of living and working in an area (Mguni and Caistor-Arendar, 2012), an example of which is described below.

The Wellbeing and Resilience Measure (WARM) was founded on the principle that "*the key to flourishing communities is to boost local assets and social wealth, while also tackling vulnerabilities and disadvantage*" (Mguni and Bacon, 2010; p8). The WARM framework captures and measures assets and vulnerabilities in local communities such as how people feel about their lives and makes an assessment of how resilient they are to future shocks. In initial trials, WARM demonstrated that it could paint a very different picture of local areas than conventional deprivation indicators (Mguni and Bacon, 2010). It could facilitate a dynamic interpretation of the factors at work within a community and the extent to which it can withstand shocks, as well as activating links to help it to adapt and transform. Importantly, the framework focuses not only on what is happening now, but also on how a community will respond in the future.

Evaluating community resilience in this way can be a valuable resource in assisting those planning services to decide where to target scarce public money, and has the potential to inform the design of policy and interventions.

WARM identifies three factors that contribute to and interact to influence community resilience (Mguni and Bacon, 2010; Mguni and Caistor-Arendar, 2012):

- Self: the way people feel about their own lives; personal wellbeing, as well as other attributes such as income or health
- Support: the quality of social and emotional supports and networks within the community
- Structure and systems: the strength of the infrastructure and environment to support people to achieve their aspirations and live a good life.

Using WARM is a five-stage process in which community organisations, the public, political leaders, public agencies and local businesses make a contribution. The stages include:

- measuring how the area has fared and is faring (using routinely collected national and local data)
- identifying assets and vulnerabilities
- benchmarking to disentangle local trends from national trends
- understanding and planning to identify priorities for action
- implementing a plan.

A case study example of the application of WARM in Brighton is presented below.

Case study: mapping community-level resilience in Brighton and Hove

The Annual Report of the Director of Public Health in Brighton explores the issue of resilience at a population level. The Wellbeing and Resilience (WARM) tool was used to map out and compare different electoral wards against a series of indicators to describe resilience in terms of assets and vulnerabilities with regards to ten different components: life satisfaction; education; health; material wellbeing; strong and stable families; belonging; local economy; public services; crime and antisocial behaviour; and infrastructure. The different components were scored across the city on a red, amber or green (RAG) rating with regard to how each compares with the rest of the UK. In addition, individual wards were scored on a RAG rating, with the comparison being how they fare against other wards within Brighton and Hove.

The city was found to score well on local economy but vulnerabilities were identified which stemmed from reliance on the service sector and current pressures on public sector employment. A need to encourage greater economic diversity in Brighton and Hove was recommended. Overall, the report concludes that the area is well placed to emerge from economic recession in a strong position.

Using the WARM tool and mapping resilience and wellbeing proved to be a complex process, but was stated to be “worthwhile to help identify strengths and weakness within the city and allow decisions to be reached about where to allocate resources”.

(Alexander *et al*., 2011)

In addition, the Canadian Centre for Community Renewal (2011) has produced a community resilience manual outlining a tool for assessing resilience in local communities. The tool identifies 23 characteristics organised under ‘people’, ‘resources’, ‘organisations’, and ‘community processes’. The manual considers that the profile or ‘portrait’ of community resilience will help to set priorities and select strategies and tools to strengthen resilience within the community. Furthermore, Experian (2010) have developed a tool to measure the resilience of a geographical area on the basis of four themes: business, people, community and place. This measure has a focus on the economic, business and employment status of a geographical area. It facilitates consideration of the strength of the local economy and business base, size of working-age population, skill levels, local average wage and measure of benefit claimants.

Following the discussion in Section 5.2 around distinguishing between resilient economies and economies which support resilience for individuals and communities, measures that distinguish between these outcomes will also be required. Whereas a secure regional economic base can be a foundation of resilience, consideration of the qualities and consequences of different economic activity as well as quantities will also be required. For example, a measure of income inequality will reveal more about social cohesion and threats to social capital than just rates of average pay alone. Income inequality can be shaped by decisions about what sort of economic growth a city or region pursues.

Each community resilience measurement tool is based on a geographic view of community, as rooted in a particular place. Non-spatial communities such as those defined by ethnicity or communities of shared interests and outlook may be harder to map than those which are geographically defined (Mguni and Bacon, 2010). Nevertheless, tools such as these can be useful when considering strategies or policies which may directly or indirectly impact on resilience.

The measurement of collective resilience at the city level

In recent years, measurement of resilience across large populations has primarily focused on analysing and evaluating the capacity of places (taken here to constitute the people, structures, interactions and transactions which occur within a geographically bound area) to withstand economic, environmental and human induced threats, trends and transitions. As discussed earlier, a key challenge for measuring resilience at such a scale is that a universal definition has not been established or agreed, resulting in wide variations in how the concept has been applied.

The resilience of cities, regions or nations is most commonly measured using a set of indicators (e.g. carbon emissions, recycling, levels of active travel) to compare places of similar characteristics, geographies and population size. Such approaches can be useful for identifying necessary action, although perhaps not sufficient for driving national policy due to the social, economic and physical differences between places. These factors invariably impact upon how places function and the degree of ease in implementing change. In an attempt to monitor threats and to prevent the escalation of their impacts, a wealth of guidance is now available to help local governments and policy-makers plan and prepare for emergencies and disasters. Global networks have emerged to help share practice and foster a sense of ‘togetherness’ in facing global challenges within a local context. However, the extensive range of guidance and indexes has, to date, tended to focus on isolated threats or broad policy themes (climate change or economic competitiveness, for example) rather than adopting a more holistic approach which considers the multiple and interdependent factors which cumulatively determine the resilience of a place.

In relation to potential future threats, three broad subjects of interest have accorded significant policy interest: ‘economic instability’; ‘environmental degradation and resource depletion’; and ‘emergency planning and security threats’. The approaches used to measure the resilience of each of these are summarised in the following section.

Economic instability

Firstly, the recent global banking crisis and subsequent recession has provided an opportunity for governments to reflect upon the resilience and sustainability of economic systems. Efforts to measure the economic resilience of regions are now commonplace, with a number of economic resilience measures and indexes now available. Of those considered, the focus has been on the strength of the economy, rather than the potential impact of economic change on the resilience of population groups, as discussed in Section 5.2. Thus, resilience in the context of the economy has largely been considered in the context of places, as opposed to an agenda driven by the wellbeing of people.

Scottish Index of Economic Resilience

In response to the economic downturn in the UK, research was conducted by Experian (2009) to measure the economic resilience of regions across Scotland, England and Wales. The Scottish Index of Economic Resilience was developed by EkosGen (2009) to assess and compare the economic performance of Scotland's 32 Local Authorities. Seventeen indicators have been included under five domains; economic dynamism, enterprise, labour market, workforce, and sectoral mix, and weighted based on their significance as a determinant of economic resilience.

West Midlands Community Economic Resilience Index

The West Midlands Community Economic Resilience Index has been developed to monitor local economies across this region over time. A set of indicators were developed and placed under three broad domains: economic, labour market and social. Indicators were weighted and areas were given domain scores between zero and one to give it an overall index score.
(Advantage West Midlands Strategy Team, 2010)

Further work around economic resilience has been carried out by the Centre for Local Economic Strategies. In the report '*Productive local economies: creating resilient places'* (McInroy and Longlands, 2010) place resilience is measured by understanding the composition and influence of the social, public and commercial economies, and the relationships between them. Resilience is judged by analysing information about a place through the lens of ten resilience measures, which relate to the different relationships that exist within a locality; the shape of the local economy (commercial, public and social), the relationships which influence the economy, and the wider relationships upon a local economic area (McInroy and Longlands, 2010). An implicit assumption within the model is that place resilience develops as a result of the strength and effectiveness of the relationships in a locality; if relationships are strong then an area is more likely to be resilient. The establishment of a framework for measuring resilience provides an opportunity to explore what local authorities can do through economic development and regeneration to distribute economic opportunity and resources more fairly. This approach to economic prosperity moves beyond the traditional notion of competitiveness by acknowledging the importance of equity and connectedness as key drivers of place resilience.

Climate change and sustainability

Climate change, resource depletion and sustainability are perhaps the most established research areas in terms of creating and measuring resilience at a global scale. The challenge has been considered in relation to its environmental, social and economic consequences (Stern, 2007), although there is an equal need for attention to be given to the potential impact of these factors on human health. In relation to population health, climate change is one of many current challenges which threaten to widen health inequalities (Sustainable Development Commission, 2011). Taken in this context, resilience co-exists and largely overlaps with the more established term, sustainability. While sustainability is about ensuring that future generations are not compromised by the actions of current generations, resilience moves beyond this notion to focus on the proactive capabilities of a system to not only exist, but to transform and flourish (Young, 2010). The concept of

resilience, therefore, is particularly relevant for considering positive responses to environmental challenges.

Typically, indexes that have attempted to measure resilience have accounted for the human dependency on oil and the availability of renewable resources. Whether or not peak oil has been reached, increases in energy prices have led to growing concerns about the negative impacts of fuel poverty and the sustainability of global food production. Post-carbon transition is unlikely to be without challenge, with cities and regions that exercise sustainable practice being better placed to cope with reductions in their resources (Newman *et al*., 2009). Thinking in structural terms, the differences in 'readiness' become an element of place-based inequality or 'climate' justice (Walker, 2012) in the sense that those most vulnerable may be least responsible for the causes or most poorly positioned to change behaviour, not just of themselves, but others.

Thus, it will be necessary to reconsider how places are developed in the future, what changes will be necessary to prevent unsustainable ecological degradation, as well as what measures will be necessary to mitigate against resource depletion, climate change and to foster a sense of common cause. In an attempt to measure such capacity and promote action, several indexes and tools have been developed, examples of which are summarised below. These tools focus on measures to mitigate climate change (sustainable practice) as well as putting measures in place to adapt to it (readiness), as discussed in detail in Section 5.4.

The Sustainable Cities Index

The Sustainable Cities Index was used to compare the 20 largest UK cities across a series of sustainability indicators from 2007 to 2010. The index was developed to shape local practice and ultimately, to help create better living conditions for local residents. The performance for each city was based on 13 indictors spread across three core themes of environmental impact, quality of life and future proofing. (Forum for the Future, 2013)

The Green City Index

The Green City Index measures the environmental performance of over 120 cities from around the world. Measures vary across global regions to take account of the different characteristics and challenges faced by participating cities. The European Green Cities Index is based on 30 indicators across eight categories using both qualitative and quantitative data. The index has been developed to allow lessons to be shared between cities.

(Siemens, 2013)

The Global Adaptation Index (GAIN)

The Global Adaptation Index has been developed to track vulnerability and readiness of nations from 1995 to present day. GAIN seeks to influence policy-makers, non-Governmental organisations and the private sector to invest in measures for adaptation. The index is based on indicators of vulnerability (water, food health and infrastructure), as well as economic, social and governance indicators which are intended to denote readiness. Countries are ranked from zero to 100, with those scoring more highly being least vulnerable and most ready.

(Global Adaptation Institute, 2013)

Local Government Self-Assessment Tool (LGSAT)

The United Nations International Strategy for Disaster Reduction (UNISDR) has produced the Local Government Self Assessment Tool which is based on ten identified essentials for making cities more resilient. These essentials can be summarised as; minimising disaster risk, budget setting, monitoring risks, investing in critical infrastructure, education and defence measures, emergency planning and supporting communities.

(United Nations Office for Disaster Risk Reduction, 2013)

Climate resilience index

Copenhagen was recently named the world's most climate-resilient city on the basis that it scores highly on a range of measures necessary for mitigating against, and adapting to, climate change. Indicators used to rank cities were political commitment, density, transit access and use, renewable energy capacity, greenhouse gas (GHG) emissions and reduction targets, climate change mitigation and adaptation planning, and acreage of parks. Copenhagen has high levels of active travel and low carbon emissions.

(Triple Pundit, 2011)

Emergency planning and security threats

Finally, emergency planning is a policy area for which ‘building resilience’ has become part of the common professional language. The first UK national security strategy emphasised that threats to the UK relate not only to security and defence issues, but also to financial systems, utilities, information systems, infrastructure and society as a whole (UK Cabinet Office, 2008). The strategy emphasised the increasing importance of community and national resilience and the need to identify emerging risks. At a national level, the presence of resilience within the discourse has focused on the ability of communities and regions to cope in an emergency. The Resilience Division of the Scottish Government is tasked with providing day-to-day advancement and implementation of policy in relation to emergency planning. ‘Ready Scotland’ (Ready Scotland, 2013) is a web-based resource which offers advice and promotes forward planning for individuals and communities based around six categories of potential emergency or threat to the population: severe weather, flooding, pandemic flu, utilities, terrorism and animal disease breakout. The emphasis in this context is on responding efficiently, rather than transformational, action.

The absence of measurement at a city/regional scale

The apparent absence of measurement scales to assess resilience in a holistic way is perhaps not surprising, given that cities and regions are incredibly complex, diverse and geographically variable. There have been few efforts to truly understand the relationship between such factors and their interdependence. As such, resilience research has tended to develop around a few key policy areas rather than developing into a distinct policy area in itself. One possible explanation is that resilient places do not tend to have a set of characteristics that can be replicated universally. For example, resilient cities are said to require a combination of opposite characteristics such as planning and adaptability as well as autonomy and collaboration (Godschalk, 2003). In this respect, it remains difficult to develop a measurement scale which could accommodate such varying circumstances, while remaining widely applicable.

Moving towards a holistic form of measurement

Paying attention to people's skills and abilities and the adaptive systems that promote healthy development and functioning has the potential to inform policy and practice to encourage human capacity and social capital and aim to improve the health and wellbeing of individuals and communities. Assessing and measuring a range of resilience-promoting processes will allow key questions about human adaptation to be investigated and addressed (Windle *et al*., 2011). By identifying the factors which promote protection or introduce vulnerability, frameworks for intervention can be developed. Such a framework can be used to develop the personal coping skills and resources pre-crisis (Olsson *et al*., 2003).

Further work is needed to advance current thinking about what populations require to maximise their resilience. It is also essential to better understand and connect the challenges and threats and the potential for transformation. In the face of growing uncertainty around climate change, peak oil and the global economy (and their multiple impacts) learning to cope will be important, but not sufficient to address such challenges and fulfil a meaningful and prosperous life. Resilience in this context, therefore, will require transformational capacity within systems and the necessary conditions for populations to thrive.

However, too literal an application of ecological or engineering principles to human systems can lead to resilience being seen as an internal property of a system, disconnected from political judgements, social policy decisions or economic trends taking place close to, or away from the site at which resilience is being measured. For these reasons, resilience measures need to be linked with existing measures that capture levels of income and health inequality, the distribution of resources and also the power individuals and communities have to set agendas and enact change within and across communities.

7. Our position on resilience

In this final section of the paper the authors seek to clarify the themes emerging from this review of the literature and to set out the GCPH position on resilience arising from this learning.

The resilience perspective is important as it goes beyond showing the effect of interventions and programmes to reduce negative outcomes to predictable and controllable events. Instead, in the face of complex global trends and processes, it provides an overarching framework for dealing with challenges and stressors that are, by their nature, multiple and unpredictable.

We believe that **structural-material issues underpin resilience for people and places – meeting basic material needs is a precursor for ongoing resilience**. While it is entirely possible to be resilient in the face of poverty and deprivation, successive periods of stress may serve to weaken and introduce vulnerabilities. Enduring resilience cannot be expected in such circumstances.

Resilience is best conceived as a process, rather than as a trait or a quality that can be possessed. It is demonstrated through outcomes of success in the face of challenge. The more fundamental the challenge, the more likely the outcomes will be characterised by transformation rather than the maintenance of a pre-crisis state. Consequently, prediction and specification of outcomes is made more difficult; transformed states are harder to predict and programme into interventions than the maintenance of pre-crisis measures of success. However, these transformed states represent a more sustainable and realistic proposition when the conditions for ‘business as usual’ are removed.

The challenge for those concerned with promoting resilience is **how to maintain conditions favourable to adaptation and change in the face of challenge**. These conditions are both internal and external to the individual; understanding adaptability as a singularly personal skill is unlikely to produce resilient networks, communities or organisations. However, neither is concentrating on the external conditions sufficient (such as the health of the economy or the rigour of accountability procedures) if it does not support the development, adaptation and promotion of capabilities to the actors that it serves. The integrative framework approach of Wilber (2001) is instructive in helping us understand why we should resist separating the dimensions of the subjective and objective, individual and collective in how we think about and deal with the reality of the social world. *"Public health cannot afford to leave out or marginalise any of these because forces exerted within a neglected dimension can destroy efforts elsewhere"* (Hanlon *et al*., 2010, p307).

Further, we propose that efforts in one dimension are unlikely to promote resilience if they have not taken account of the others. For example, **individual and collective resilience are not separate qualities; they are interconnected**. Characteristics that support resilience in individuals are also ones which build strong interpersonal relationships at a network level and allow transfers of information and support. Empathy, intelligence, interpersonal skills, the ability to ask for help (and being able to identify and navigate appropriate sources of help) are the building blocks of wider social capital. Promoting the resilience of individuals should not be seen as antithetical to collective endeavours but as a point of entry to building stronger networks and communities. However, understanding (and measuring) resilience conceived as an individual characteristic will misconceive the nature of the phenomenon.

Culture, economy, governance and infrastructure: integrating four realms

We propose that **building resilience at levels broader than the individual requires attention to four substantive areas: culture, the economy, infrastructure and governance**. We believe action here needs to be integrated and although, inevitably, actions will be taken within the

professional and practical remits of each domain, policy and planning should take account of how all align. Leading by a philosophy of resilience involves promoting key characteristics which support resilient responses; ***flexibility, diversity*** **and** ***participation*** support transformation and adaptation when challenges to existing ways of living are presented.

In the realm of ***culture***, opportunities for participation which view individuals as producers as well as consumers of cultural output allow a diversity of narratives and forms of meaning-making to enter the frame of collective understandings. As well as promoting the appreciation of diverse perspectives and values, these various stories can become the raw source material for creating new ways of being when crisis threatens established patterns of living. Further, involvement in the production of such narratives can also promote the networks and skills for promoting social inclusion.

The ***economy*** is often neglected in public health perspectives. Similarly, government leaders, while viewing a healthy workforce as a pre-requisite for a strong economy, often regard health as a policy area that is not closely related to employment and the economy. The resilience perspective offers a means of aligning these perspectives. By shifting attention away from factors which promote the resilience of economies (which can neglect the resilience of individuals) to economies which promote resilience, economic benefits can accrue through a more creative, engaged and purposeful workforce and society. This shift requires a focus on the quality of employment offered by an economy as well as its quantities in terms of pay and rates of employment. Furthermore, the value of activity within the hidden economy, where unpaid work supports the successful operation of the economy, should also be factored into economic planning and the assessment of economic performance.

The creativity and ingenuity crucial to promoting resilience across all four themes – culture, the economy, governance and infrastructure – are required in economic thinking also – not just within the discrete creative industries but by allowing opportunities for personal growth and forms of work which support

personal narratives of progress. Such engaged employees can be become assets in times of challenge and upheaval, comprising the collective intelligence from which new forms of economic activity can emerge.

Governance requirements for resilient systems echo this need to allow space for forms of individual meaning-making alongside institutional requirements for accountability at both national and local levels. Flattened hierarchical structures or diffused decision-making promotes the integration of what works within local conditions and can offer the wider system sources of transformation in the face of challenge. The challenge for current governance orthodoxy will be to accept inefficiencies. A culture of learning will also be difficult to promote when risk aversion and standardisation of procedures are guiding perspectives.

From disaster planning perspectives ***infrastructure*** is a key starting point for appraising the resilience of regions or societies. The speed at which the movement of people, goods and services can be re-established and reconnected after a crisis is critical to responses and returning to ‘business as usual’. The transformational version of resilience we promote in this paper offers a different perspective on infrastructure which is about allowing the promotion and development of key resilience-enhancing processes and structures pre-crisis. Thinking about infrastructure at a community scale can facilitate ways of living which allow the interactions that support the development of social capitals, networks that are stronger and more diverse, and the cross-pollination of ideas and narratives about those places, making them more resilient as a result. This is a value which extends beyond the benefits that accrue in relation to sustainability where the need to travel is reduced and local provision of needs can be satisfied.

Where to next?

This initial exploration of the resilience concept in relation to public health concerns does not conclude with a set of prescriptive recommendations. Rather it is hoped that this paper will point those interested in the resilience concept in a direction where they are able to utilise their own expertise and resources to promote collective perspectives.

It is recognised that the resilience perspective is potentially difficult for policy and practice domains to have as an objective and to implement: the perspective calls for thinking beyond the scope of each domain and requires coordination. Resilient individuals and resilient communities cannot be created through the action of one particular professional group or area of policy. Actions must be aligned at the level of individuals with community development, economic planning, service provision and infrastructure planning.

Consequently, the authors' next steps should support this task. Actions could include:

Case study learning

Exploring the experiences of communities which have responded to challenge and provide learning about resilience processes. Communities may include:

- those which have responded to an extreme weather event (such as the Isle of Arran during the winter of 2013) which required drawing upon resources of ingenuity and community to mitigate service breakdown or other forms of hardship.
- a community which has suffered a severe economic shock such as the loss of an industry or employer central to that place's sense of identity and role (the loss of Kilmarnock's whiskey-bottling plant being a local example).

The case studies could explore the processes of mitigation and transformation and the journey to post-crisis harmony focusing on the roles of the four identified realms of culture, economy, governance and infrastructure.

Resilience workshops

Another way of exploring local expertise and developing resilient perspectives would be to hold workshops with members of organisations or communities as a means of stimulating discussion and learning from real-life experience.

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Appendix 1. Overview of individual level resilience measurement scales.

Name of scale	Target population	Description of scale	Purpose of the measure and psychometric properties	Author(s)
The Dispositional Resilience Scale	Adults	A self-report scale across three dimensions ranging from 45 to 15 items depending on the version of scale. Original scale and two further refinements available.	Designed to measure psychological hardiness across three dimensions: commitment, control and challenge.	Bartone, 2007
The Connor-Davidson Resilience Scale (CD-RISC)	Adults – general population and in clinical samples	A self-report scale, comprising 25 items across five dimensions. Short version of original scale, comprising ten items across one dimension.	Developed for clinical practice as a measure of coping ability. Five factor dimensions: personal competence, trust/tolerance/strengthening effects of stress, acceptance of change and secure relationships, control, spiritual influences.	Connor and Davidson, 2003 Campbell-Sills and Stein, 2007
The Resilience Scale for Adults (RSA)	Adults	A self-report scale across five dimensions ranging from 37 to 33 items depending on the version of scale. Original scale and one further refinement.	To examine intrapersonal and interpersonal protective factors presumed to facilitate adaptation to psychosocial adversities. Five dimensions: personal competence, social competence, family coherence, social support, and personal structure. New dimensions in scale refinement (2005): personal strength, social competence, structured style, family cohesion,	Friborg *et al*., 2003

			and social resources.	
Youth Resiliency: Assessing Developmental Strengths Scale (YR:ADS)	Youth (age 12-17 years)	A self-report scale comprising 94 items across ten dimensions.	To examine protective factors; intrinsic and extrinsic developmental strengths across ten dimensions: family, community, peers, work commitment and learning, school, social sensitivity, cultural sensitivity,self concept, empowerment, and self control.	Donnon and Hammond, 2007
The Resiliency Attitudes and Skills Profile	Youth (age 12-19 years)	A self-report scale comprising 34 items across seven dimensions.	To measure resiliency attitudes in youth for services providing interventions across seven dimensions: insight, independence, creativity, humour, initiative, relationships, values, and orientation.	Hurtes and Allen, 2001
Adolescent Resilience Scale	Japanese youth (age 19-23 years)	A self-report scale comprising 21 items across three dimensions.	To measure psychological characteristics of resilient Japanese youth across three dimensions: novelty seeking, emotional regulation, and positive future orientation.	Oshio *et al*., 2003
The Brief Resilience Scale	Adults (age 19-62 years)	A self-report scale comprising six items across one dimension.	Designed as an outcome measure to assess the ability to 'bounce back' or recover from stress.	Smith *et al*., 2008
The Resilience Scale (RS)	Adults, with some application with 16-23 year olds	A self-report scale comprising 25 items across two dimensions.	To identify the degree of individual resilience; a positive personality characteristic that enhances individual adaptation. Dimensions: personal	Wagnild and Young, 1993

			competence and acceptance of self and life.	
Psychological Resilience	Older adults	A self-report scale comprising 19 items across three dimensions.	To assess psychological resilience that acts as a protective factor against risks and adversity. Dimensions: self-esteem, personal competence and interpersonal control.	Windle *et al*., 2008
Ego Resiliency	Adults (age 18-48 years)	A self-report scale comprising 20 items across four dimensions.	To assess the components of ego-resiliency across four dimensions: confident optimism, productive and autonomous activity, interpersonal warmth, and skilled expressiveness.	Klohnen,1996
The ER 89	Young adults (18-23 years)	A self-complete 14 item questionnaire.	To measure ego-resiliency (ER) (a stable personality trait)	Block and Kremen, 1996
Resilience Scale for Adolescents (READ)	Adolescents (age 13-15 years)	A self-report scale comprising 39 items across five dimensions.	To assess the protective resources of personal competence, social competence, structured style, family cohesion, and social resources so as to understand stress adaptation.	Hjemdal *et al*., 2003
The Child and Youth Resilience Measure (CYRM)	Youth at risk (age 12-23 years)	A self-report scale comprising 28 items across four dimensions.	To develop a culturally- and contextually-relevant measure of child and youth resilience across four dimensions: individual, relational, community, and culture.	Ungar *et al*., 2008
California Healthy Kids	Primary school children	A self-report scale comprising 34 items across 12 dimensions.	To assess student perceptions of their individual characteristics and protective resources across	Sun and Stewart, 2007

Survey – The Resilience Scale of the Student Survey			12 dimensions: communication and cooperation, self-esteem, empathy, problem solving, goals and aspirations, family connection, school connection, community connection, experience, peers, participation, and peer support.	
Resiliency Attitudes Scales (RAS)	Parents and children	A self-report scale completed by both the parent and the child, comprising of 72 and 56 items respectively across eight dimensions.	To assess attitudes that underpin resiliency across eight dimensions: insight, relationships, initiative, creativity, humour, morality, persistency, and belief in the ability to improve things.	Biscoe and Harris, 1994

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