

Towards a resilient perspective in building conservation

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Abstract

Purpose – The purpose of this paper is to describe the cross-fertilisation process between the concept of resilience and building conservation. The authors discuss how the conservation field can address new issues posed by climate change and whether the concept of resilience plays a role within the framework of sustainable building conservation.

Design/methodology/approach – Starting from the use of resilience as a “travelling concept”, different interpretations of the term emerging from different fields are compared and interrelated in order to understand how this concept can impact future research in building conservation.

Findings – In addition to summarising recent developments in conservation theory with a special focus on how sustainability has influenced the field, this work also suggests some lines of research where resilience could foster interdisciplinary approaches to building conservation and presents some controversial outcomes.

Originality/value – The paper raises a discussion on how the concept of resilience could renew the field of building conservation, helping contemporary society to address the challenges of climate change.

Keywords Resilience, Sustainability, Building conservation, Contemporary conservation theories

Paper type Conceptual paper

Introduction

“Climate change is one of the most significant risks for World Heritage to emerge since the adoption of the World Heritage Convention in 1972” (Markham *et al.*, 2016). The impacts of climate change on cultural heritage are among the top issues on the agenda of most preservation organisations. According to the World Heritage Committee, “[they] are affecting many and are likely to affect many more World Heritage properties, both natural and cultural in the years to come” (World Heritage Committee, 2005). Many publications attest to the UNESCO commitment to addressing this issue (UNESCO, 2007a,b, 2008; Welling *et al.*, 2015) and ICOMOS (2007) recommended “that climate change adaptation strategies for cultural heritage should be mainstreamed into the existing methodologies for preservation and conservation of sites, buildings, settlements, landscapes, movable objects and the living traditions”.

Built heritage is particularly exposed to both direct and indirect threats related to climate change, since it is usually tied to its social and environmental context; after all, historic buildings, sites and cities can hardly be moved to safer places when in danger. Moreover, the survival of all these structures as living heritage is better guaranteed by an assured continuity of use. For these reasons, built heritage has often embedded in it the capacity of a local community to adapt to the surrounding natural environment and climate, but global warming and climate change are likely to pose serious threats that could disrupt this supposed equilibrium.

Within the debate about sustainable development and climate change adaptation, the interest in the concept of resilience has grown. Can this concept mark a change of perspective in the conservation field and help to make built heritage more reactive and adaptive to those threats?

The aim of this conceptual paper is to promote a discussion of issues and opportunities when applying the resilience theory to the field of heritage conservation, with a specific focus on building conservation. The authors will outline how the concept of resilience

could foster interdisciplinary research in building conservation and may help to develop innovative models and tools that increase the adaptive capacity of built heritage (O'Brien *et al.*, 2015).

Regarding methodology, the analysis of the multidisciplinary concept of resilience has implied the use of sources from different fields (heritage and natural conservation, geography and urban studies, disasters risk management etc.). Given the extent of the topic, the range of scientific literature may thus be widened.

Resilience will be analysed as a “nomadic” or “travelling” concept (Stengers, 1987; Bal, 2002), i.e. a concept that travels among different scientific fields, slightly changing meaning and use. Travelling concepts have been proposed as heuristic tools and constitute the backbone of an interdisciplinary and intersubjective approach: “not because they mean the same for everyone but because they don’t” (Bal, 2002, p. 11). Following this approach, the authors compare definitions and interpretations of resilience from different fields, then transfer them to the field of building conservation and finally assess the consequences of their application.

The first paragraph will summarise recent developments in conservation theory, giving special attention to the relationship between environment, sustainability and building conservation. After a theoretical discussion of the introduction of resilience within the heritage field, the authors propose some research areas, showing its potential for building conservation in a climate change scenario.

Cultural heritage, environment and sustainability in contemporary society

Cultural heritage conservation has already been described as a discipline resulting from a cumulative process of knowledge, which has constantly extended its field of action thanks to a cross-fertilisation process with other disciplines (Muñoz Viñas, 2012). The framework of cultural values on which the conservation of cultural heritage is based has significantly changed over the last few decades (Araoz, 2011). Heritage conservation has faced dramatic political and social changes in society, such as de-industrialisation, de-colonisation, immigration and the quest for inclusivity in the globalised world, proving able to renew itself through dialogue with both social and hard sciences.

Conservation is a part of modernity, since it was developed in Europe in the late nineteenth century, as an intellectual reaction to industrialisation, urbanisation and alienation. Since the past became a “foreign country” (Lowenthal, 1985), conservation has aimed to make it possible to re-live the past by preserving the tangible evidence of its existence, that is heritage, and contributing in this way to the building up of the national identities of western societies. The conservation of monuments has then grown as a social discipline on a long path through the twentieth century and has been finally recognised as one of the ways history has been managed (Speitkamp, 1996). The attention paid to the built environment and the key role played by material culture, have both contributed to the reassessment of the theoretical core of the discipline in the second half of the twentieth century (Petzet, 2004). Meanwhile, the field of cultural studies has stressed a post-modern view of cultural heritage as the product of uneven power relationships in our society (Smith, 2006).

The 1972 World Heritage Convention formalised the interrelation between cultural and natural heritage. It recognised the universal value of natural and cultural heritage as a common good for humanity and promoted a joint effort for its worldwide protection against the risks of global society and indiscriminate economic development (UNESCO, 1972). The green movement and the attention on the global environment have grown in contemporary society and have influenced the field of building conservation. The protection of the environment combines individual and public interest, as nature is a common good by definition and defending the environment may help everyone to fight threats to their own health, such as polluted air, water and food (Jelin, 2000).

The over-quoted definition of sustainable development (Brundtland Report: UN, 1987) represented a change of perspective from environmentalism to the paradigm of sustainability, in an attempt to balance the need for economic development and human wealth against the Earth's ability to absorb its impact without affecting the limited natural resources. The Rio 1992 and Johannesburg 2002 Earth summits set the agenda for limiting the effects of climate change and confirmed the link between the fight for the environment and the fight against poverty in developing countries. Cultural heritage joined the discussion as the Rio+20 final document recognised "the need for conservation as appropriate of the natural and cultural heritage of human settlements, the revitalization of historic districts, and the rehabilitation of city centres" (UN, 2012, p. 24) and, more recently, "the ambitious new 2030 Agenda for Sustainable Development [...] addresses cultural heritage in the context of sustainable development for the first time" (Markham *et al.*, 2016; see also Bandarin *et al.*, 2011).

Scholars have already underlined what sustainability and conservation have in common, since "The Brundtland definition of sustainable development [...] is reflected in the aim of the conservation of cultural heritage, which is to pass the maximum significance to future generations" (Staniforth, 2000; see also Muñoz Viñas, 2012; Pereira Roders and van Oers, 2011, 2014). Conservation, like sustainability, aims at reusing and not wasting a unique, non-renewable, non-replaceable and non-interchangeable resource (EU Council, 2014), such as cultural heritage.

Sustainability and building conservation have other contact points e.g. the interest in the adaptive reuse of the existing building stock in order to limit the waste of resources and soil, the valorisation of a living heritage by promoting the use of local materials, and the study of old skills and techniques for preserving and managing historical buildings and cultural landscapes (Teutonico and Matero, 2003).

The act of saving, protecting and keeping in use valuable and irreplaceable assets may thus be seen as an intrinsically sustainable activity, and the concept of sustainable preservation has undoubtedly contributed to update the contemporary idea of building conservation. However, some controversial outcomes can arise.

The boom in research, international directives and national policies aimed at increasing the energy efficiency of historic buildings is a consequence of the sustainability mainstream. Nevertheless, many institutions for the protection of historic buildings have denounced the risks resulting from the uncritical application of energy-saving measures or from the ill-advised activity of energy retrofitting (Della Torre, 2010; Grimoldi, 2010). This was the case in many EU countries since specific financial incentives for the building construction sector have encouraged the energy retrofitting of historic buildings. A very undesirable outcome of this process was, for example, the loss of countless historic windows, which have been replaced with new ones (Fossdal, 1996). Building regulations usually avoid the potential conflict between sustainability and conservation by exempting listed or protected buildings from the fulfilment of requirements. This may result in a paradox where "all buildings (old, new, listed, or unlisted) must guarantee the same performance and when it is not possible to reach the highest levels (e.g. obtain the *U*-value defined by the standards) the alternative is to do nothing" (Pracchi, 2014, p. 211). A review of the whole building and conservation process, based on life-cycle assessment, may help to combine conservation and sustainability. It would have the advantages of an approach oriented to preservation in terms not only of energy savings but also of economic viability and cost efficiency (Preservation Green Lab, 2012). In fact, any component of a historic building embeds in it both a cultural value and a certain amount of energy, which was once used to produce the building itself. In addition, pre-industrial building techniques were designed to ensure durability and a significant life expectancy. Such buildings were usually designed more to be repaired and adapted to new uses, rather than replaced.

Another good example of how sustainability has impacted the field of conservation can be found in museums. The international standards for conservation environment have been the subject of a harsh debate for nearly a century (Luciani, 2013), discussing whether the indoor environment of a museum, which is a measure of preventive conservation, should rest on strict predetermined thresholds of temperature and humidity, which are generally energy-consuming. In the 2000s, the push for reducing museums' carbon footprints tipped the balance in favour of a more relaxed and energy-saving control of the indoor environment (IIC, 2010; Kirby Atkinson, 2014), thus showing how "The issue of museum sustainability is much broader than the discussion on environmental standards, and needs to be a key underlying criterion of future principles" (IIC, 2014).

In the context of sustainable development and the fight against climate change, resilience is a word increasingly recurring in scientific literature and on political agendas. This concept is generally included among the strategies that pursue sustainable development, though it was also meant as a way to go beyond sustainability: where the latter thinks that "humanity might finally achieve a lasting equilibrium with our planet", the former "looks for ways to manage an imbalanced world" and its increasing and irreversible disequilibrium (Zolli, 2012). This perspective would imply a shift from the implementation of mitigation strategies to the development of adaptive capacities. The next paragraphs will attempt to describe critically the risks and opportunities that the concept of resilience may produce when transferred into the theory and practice of conservation.

Introducing resilience into the field of cultural heritage conservation

Resilience is a concept derived from material science and has already been used in psychology and ecology. It is generally associated with the idea of resisting or bouncing back and recovering after a shock, but also with the activity of preparation and reaction against the threats of human activity or natural disasters. In relation to the crucial challenge of facing the dangers of climate change, resilience has become of increasing interest to scholars of many disciplines, including the field of cultural heritage conservation.

UNISDR (2009) comprehensively defined resilience as "The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions". The concepts of preserving and restoring something, though in a broader sense, are already part of this definition, but the notion of resilience in the field of heritage conservation mainly refers to the idea that protection of cultural heritage may help to strengthen the resilience of a community and reduce the impact of a catastrophe. This was acknowledged by the ICORP document on ICORP (2013, see paragraph 2.4) and by the Sendai Framework for Disaster Risk Reduction 2015-2030 (UNISDR, 2015), where the protection of "cultural and collecting institutions and other sites of historical, cultural heritage and religious interest" is quoted among the measures for disaster risk reduction (Priority 3, 30d).

However, the link between resilience and conservation is more complex, and it is worth exploring the cross-fertilisation process between these two concepts, following the idea that a resilience perspective (Folke *et al.*, 2010) may help the development of new theoretical approaches to cultural heritage conservation in general, and building conservation in particular.

A first step is to recognise the tautological argument that any tangible heritage we inherited from the past has been, to some extent, intrinsically resilient. If a historic object or building has lasted for centuries, it must embody some features of resilience, which have allowed it to withstand natural events and human actions and to be recognised for its cultural significance and cared for by a society (or even different societies) throughout history. Nevertheless, even if heritage was able to survive until present times, it is not

guaranteed that it will resist new and different stresses in the near future e.g. those caused by climate change. As Historic Environment Scotland has pointed out about traditional buildings: “Maintenance and repair are the first steps in increasing resilience, but climate change presents new challenges, and some buildings may need to be adapted if they are to cope with the projected changes” (HES, 2016).

How can we recognise those features that have made heritage resilient until now? Also, how can we assess whether those features are still strong enough to resist new threats and risks in the near future?

A second issue affects this process of acknowledgement: despite the definition by UNISDR quoted above, there is no univocal interpretation of the term “resilience”, since it has been used with different meanings by several scientific disciplines (Manyena, 2006; MacAskill and Guthrie, 2014; Reghezza-Zitt and Rufat, 2015). The word is associated in materials science and engineering with the capacity of a material to withstand an impact or a force by elastic deformation, while in human and social psychology, it is the capacity of a person or a community to react to shocks and stresses. Resilience has also been applied to complex systems, from ecosystems in ecology to territorial and spatial systems in geography and urban studies. Finally, resilience has been used in risk management to assess critical systems and infrastructure in the face of natural and man-made disasters, and has even been considered as a new paradigm in the field (McEntire *et al.*, 2002; Sudmeier-Rieux, 2014).

Reghezza-Zitt *et al.* (2012) highlighted the controversies that may arise from the different uses and misuses of this polysemous concept and have also identified a dual interpretation of the term among different authors and researchers. Resilience may be an inherent quality of a system, which is revealed when an impact occurs, or may be interpreted as the outcome of a process (see also Cutter *et al.*, 2008). The two meanings are not necessarily univocal or in conflict, and both of them can be applied to conservation.

The first one recalls the above-mentioned idea of an inherently resilient heritage. In this perspective, human history and natural forces have selected the most resilient heritage and, currently, analysis should make possible an assessment of those particular features that made heritage resilient.

In the second case, resilience is determined by changes of state. Therefore, contradictory outcomes could result from the association of this interpretation of resilience with conservation and heritage, depending on what meaning is given to terms such as persistence, equilibrium or stability. A good example derives from Holling’s distinction between engineering resilience, which “concentrates on stability near an equilibrium steady state, where resistance to disturbance and speed of return to the equilibrium are used to measure the property”, and ecological resilience as “the amount of disturbance that can be sustained before a change in system control and structure occurs” (Holling, 1996). An interpretation close to the former definition would focus on those properties favouring a quick return to a single and original state of equilibrium. In building conservation, it may be associated with the traditional idea of restoration or with a quick reconstructive action. On the other hand, the concept of ecological resilience implies the existence of several states of equilibrium, stable and unstable, which may evolve and change over time, provided that some structural properties of the system are maintained. This second interpretation reflects the idea of conservation as “dynamic management of change” (Feilden, 1982) or as “control of the transformation” (Bellini, 1996). Other interpretations of resilience lead to similar conclusions, as they propose the concepts of “transformational resilience” (Dovers and Handmer, 1992) and indicate “transformability” as a key property of a resilient system (Béné *et al.*, 2012).

A discussion about these different theoretical interpretations of resilience and about their possible application to heritage shows that this concept has a high heuristic value and how

variously it may be interpreted. Starting from this premise, new interesting lines of research may be explored through the involvement of resilience within the context of sustainable building conservation. Some of them are proposed below.

Towards a resilient built heritage

As already stated, dangers related to climate change are likely to be among the main threats to the preservation of the built environment over the next few decades. As a consequence, researchers, practitioners and stakeholders within the building conservation field will be increasingly engaged in designing an operational framework for the promotion of resilient actions. What follows is an outline of how the cross-fertilisation between academic conceptualisations of heritage conservation and resilience could foster innovative research outcomes.

The first line of research follows the application of the above-mentioned concept of inherent resilience to built heritage. The main task concerns how to set tools and indicators to assess, and eventually increase, the resilience of built heritage. Considering the multifaceted nature of resilience, several disciplines have already proposed different indicators, both quantitative and qualitative (Cutter *et al.*, 2008). Authors have also indicated some features, which a resilient system must possess: flexibility, redundancy, diversification, adaptability, replicability, stiffness, learning capacity, etc.

In the case of built heritage, it has already been observed that many of these properties can be associated with traditional construction and knowledge: “Local technologies and construction practices often reflect adaptations to environmental conditions. [...] Traditional construction technologies that have evolved through trial and error are often very resilient because of indigenous knowledge that has enabled these technologies to manage local hazards and use local materials” (ICORP, 2013).

That is why, apart from the parameters emerging from engineering and hard sciences, a renewed interest in the methodology already developed by studies in construction history could help to understand the resilience of built heritage better. From a resilient perspective, actions such as in-field observation and survey, historic research and comparative assessments would acquire a new meaning, since these approaches include in the analysis both the tangible components of heritage i.e. material structures and components historically produced by individuals and societies, and the intangible ones i.e. traditional craftsmanship and the local construction skills.

Contemporary methodologies and techniques should not be avoided, but used in an informed way and properly integrated within a traditional context. The more traditional techniques are still widely appreciated and kept in use (despite modern alternatives such as reinforced concrete), the more they can play a role in increasing the resilience of a community. This can also help communities to keep in use, or adaptively reuse, the historic buildings and the historic environment they live in.

A second line of research, evoking Holling’s definition of ecological resilience, should investigate the application of process-resilience to built heritage, with the aim of understanding how historic buildings, complexes or sites cope with change. It should shift the question from “which features make built heritage resilient?” to “what properties, if kept throughout time, allow the recognition of a built environment as heritage, and therefore its resilience and chance to be transmitted to the future?” This shift may be crucial from a preservationist perspective and issues already explored by contemporary conservation theory (Muñoz Viñas, 2012), such as the value assessment methodology (de la Torre, 2002) and the fundamental concepts of authenticity (ICOMOS, 1994) and cultural significance (Australia ICOMOS, 2000), may significantly contribute to answer the question.

Values and cultural significance can indeed be identified as the structural and persistent properties of heritage as a system. This does not imply that they are invariant or immutable,

because heritage values are continuously changing in relation to the social context, as the contemporary theory of conservation has shown. From this perspective, the concept of resilience has already been explored within the context of geography and spatial systems. Reghezza-Zitt *et al.* (2012), after Aschan-Leygonie (2000), defined it as “the ability of a system (social, spatial, economical, etc.) to reproduce itself: it is not continuity without change but the ability of an element at risk to maintain itself through a disruption or even to assimilate the disruption to its functioning”. This definition reflects some assumptions about heritage as a social construction and about conservation which “is not merely an arresting process but means of creating and recreating heritage” and “a process that consistently recreates its product (cultural heritage), accumulating the marks of passing generations” (Avrami *et al.*, 2000, p. 7).

Heritage, and particularly built heritage, may thus be seen as a system in constant change. The resilience value of such a system is not only intrinsic to materials and structures but also determined by the multiple and variable links with other social, spatial and economic systems. Consequently, the research on cultural heritage resilience may benefit from the results already obtained when applying the concept of resilience to complex spatial systems, such as urban settlements (Colucci, 2012; Papa *et al.*, 2015). In particular, cities present the highest concentration of built heritage and, at the same time, the highest concentration of risks (UNISDR, 2010), especially those related to disasters and climate change impact. It is not by chance that two of the earliest international documents linking heritage and resilience, the “Venice declaration on building resilience at the local level towards protected cultural heritage and climate change adaptation strategies” (UNISDR, 2012) and the “Statement of Amsterdam on Heritage and Water” (ICOMOS, 2013), have related this question with urban planning and water management, including the built environment and other spatial infrastructure in the discussion.

Increasingly, the application of social science methodologies to the academic discussion of cultural heritage is growing, as it has done in anthropology, archaeology, urban studies and planning. Although this has already been largely discussed by contemporary theorists in conservation, it acquires a slightly different meaning within a resilient perspective. It has already been explored as to how the protection of cultural heritage may strengthen the resilience of a community and reduce the impacts of a natural disaster: “In the same way that biological diversity increases the resilience of natural systems, cultural diversity has the capacity to increase the resilience of social systems. The maintenance of cultural diversity into the future, and the knowledge, innovations and outlooks it contains, increase the capacity of human systems to adapt to and cope with change” (ICORP, 2013, p. 21; see also D’Amico and Currà, 2014). If cultural heritage can help the resilience of a community, the contrary is also true: the built environment may take advantage of a community actively involved in conservation activities. A further point of discussion about heritage and resilience has, thus, to build on the relationship between communities and cultural heritage conservation (see Waterton and Smith, 2010; Chitty, 2017).

The growing attention to adaptation strategies and the increasing decentralisation of authority and resources for disaster risk reduction (UNISDR, 2015) result in a spur to local communities to assume direct responsibility for the protection of cultural and built heritage. The importance of the involvement of local communities is also stressed by ICOMOS (2008). In the field of heritage protection, this may encourage a shift from the ordinary top-down approach, where safeguarding is mainly delegated to central national or international authorities, to a bottom-up process where local authorities, institutions and associations must be proactively involved. Similarly, considering the widespread nature of climate change risks, small-scale projects that actively involve local stakeholders should be effectively connected in larger networks to improve the resilience capacity of built heritage at different scales.

Conclusions

In the last 20 years, research on building conservation has successfully focussed on demonstrating that built heritage is compatible with sustainable development, social inclusion and economic growth (Sanetra-Szeliga, 2015). In a mitigation approach, it is crucial to acknowledge that built heritage is inherently sustainable and inclusive. Nevertheless, this position risks being insufficient for making built heritage able to adapt to the consequences of climate change.

The paper has shown that the complex concept of resilience offers an opportunity, since an extensive and inclusive interpretation of the term can foster knowledge transfers and methodology integration among different scientific fields and allow their application within the paradigm of sustainable heritage conservation. The idea of resilience as an operative framework finds direct application in the knowledge transfers among the disaster risk management field and the studies of built heritage vulnerability to natural hazards. At the same time, analysing the resilience of complex spatial systems at different scales is crucial, since built heritage is a part of the built environment. Understanding how communities can be involved in building conservation by means of an effective implementation of participatory methods and research can make a case for the wider application of social science methodologies to the reconceptualisation of resilience in the context of built heritage.

Many authors have ascribed the increasing popularity of resilience to its capability in conveying positive messages to the most vulnerable parts of society, describing resilience as a “change in the political discourse” (Reghezza-Zitt *et al.*, 2012) or as a “policy narrative” (Béné *et al.*, 2012). They nevertheless suggest being aware of some controversial outcomes that can result from the use of such an ambiguous term. Resilience has already been largely used and discussed in the field of disaster and risk management, where scholars have underlined the risk of it being rendered meaningless by overuse or misuse “After thirty years of academic analysis and debate, the definition of resilience has become so broad as to render it almost meaningless” (Klein *et al.*, 2003).

For similar reasons, difficulties in turning resilience theories into practice can arise. The interpretation of resilience as a travelling concept, which was discussed in this paper, can help a shared definition among different stakeholders on what is meant by resilience and on how to pursue it. This would be beneficial before implementing any planned action.

When applying resilience to the built heritage, we should also consider the implications of the “inherent resilience” concept. If the resilience of a system can only be revealed through an impact, there will always be a certain degree of uncertainty on its capacity to persist after a new event or change in the surrounding context. Also, when dealing with heritage, any further loss can be catastrophic and permanent. This is especially problematic in the case of modern and contemporary heritage, for which the test of time is not a valid argument and which can present some intrinsic fragile characteristics (e.g. use of experimental materials and techniques, lack of general recognition of its heritage value).

Moreover, the focus on the capacities of vulnerable parts of society, which is implied by the concept of resilience, can have positive outcomes in promoting their direct assumption of responsibility, but it can also lower the commitment of the institutions or even turn the victims of a disastrous event into the ones to blame if things go wrong. It must be remembered that the resilience of a complex system needs to work at different scales to be effective.

Resilience was defined as the “keyword of our era” (Bartezzaghi and Rampini, 2013) as it represents the positive capacity of society to face a period of crisis. Climate change risks were addressed by this paper, but many other types of “crisis” are currently affecting heritage. Among the most recent ones worth mentioning include the budget cuts in several institutions after the 2008 economic crisis, war destroying heritage sites in Iraq and Syria, and the growing impact of mass tourism and migrations. If the field of building

conservation wants to have a more proactive role in contemporary society and wants to cope effectively with the risks of an unstable world, it will be probably called to endorse a resilience perspective, but it should avoid doing it uncritically. This paper has tried to present some issues arising from the cross-fertilisation of resilience with built heritage, considerations that are not meant to be conclusive or exhaustive. Rather, they are an invitation to open and extend the debate on this question, which, in the authors' opinion, is a crucial one for the future of the discipline.

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