Regional Studies Association European Conference
"Networked regions and cities in times of fragmentation: Developing smart, sustainable and inclusive places".
13th –16th May 2012: Delft University Technology, Delft, Netherlands.

The remarkable resilience of Florence, city of art.

Luciana Lazzeretti*

*Department of Management, University of Florence

Special session: Clusters life cycles and territorial resilience in knowledge-based economies.

ABSTRACT

The debate on the relationship between cities and innovation, which started from Jane Jacobs' seminal work (1969), has then focused on the effects of diversity vs specialization in localized knowledge spillovers. An intensification has recently taken place thanks to the literature on creative economy. The concepts of creative city, creative clusters and cultural-creative industries have come to the fore and have developed alongside that of creative class (Florida, 2002).

In parallel, the safeguard and preservation of artistic, environmental and cultural heritage within historical centres has become a relevant issue not only for urban planners and art historians, but also for economists and management scholars interested in creativity and innovation. If culture was previously considered as an asset to protect and preserve for its capability to foster economic development, nowadays it is mainly considered as a resource for innovation.

The social and local dimension of creativity is rapidly asserting itself, making the relationship between creativity, community and place all the more relevant. The main underlying hypothesis is that ideas and innovations develop more easily in informal settings and public spaces – whether they be physical places such as cities of art and industrial districts or virtual spaces like online social networks such as Facebook and Twitter. These observations must be seen in connection with the emerging open innovation paradigm, which stresses the role of creative contexts and external knowledge in addition to (or in replacement of) knowledge created in internal R&D labs.

Over the last decade, the variety of contributions to the debate has been further enriched thanks to the ecological approach with to its application of the concept of resilience to social systems. Resilience, adaptability and transformability are considered as the three related attributes of social-ecological systems that determine their future trajectories.

In this paper, we aim to contribute to the still under-researched debate on urban and regional economic resilience by proposing some reflections focused on cities of art. In particular, we aim to study the stable resilience of cities of art facing the challenge of the second modernity and the globalization process.

According to Holling (1973), resilience is not only the capacity to absorb shocks and maintain function, but it also includes a second aspect concerning the capacity for renewal, re-organization and development, to be taken in consideration for redesigning a sustainable future. In this sense, we discuss the idea that some creative cities are also resilient cities as they are capable not only of preserving and economically enhancing their material and immaterial cultural and artistic heritage, but also of transforming themselves in response to external pressures, generating local development and growth.

Following the concept of *creative capacity of culture*, we consider the city of art as an informal, collective open space that can absorb and recombine art and culture leading to novelty and renewing. We present and discuss three case studies of lateral, transversal and path-dependent innovation occurring in Florence through cross-fertilization and serendipity between cultural and creative clusters, museums and art restoration centres (the 'Florence and Science' exhibition, the use of laser technologies for conservation, and the discovery of the Stendhal syndrome). We look for an 'innovation Renaissance' combining arts and sciences as a result of a commonly-shared and embedded value.

1 Introduction: Creative city, innovation and resilience

The debate on the relationship between cities and innovation, which started from Jane Jacobs' seminal work (1969), has then focused on the effects of diversity vs specialization in localized knowledge spillovers (Feldman and Audretsch, 1999). An intensification has recently taken place thanks to the literature on creative economy. The concepts of creative city, creative clusters (Chapain et al., 2010) and cultural-creative industries (Lazzeretti, 2012) have come to the fore and have developed alongside that of creative class (Florida, 2002). Moreover, the notion of creative city has expanded to involve not only large metropolitan areas, but also suburbs, small towns and rural areas (Andersson, Andersson and Mellander, 2011).

In parallel, the safeguard and preservation of artistic, environmental and cultural heritage within historical centres has become a relevant issue not only for urban planners and art historians, but also for economists and management scholars interested in creativity and innovation (Belussi and Staber, 2012). If culture was previously considered as an asset to protect and preserve for its capability to foster economic development (Cooke and Lazzeretti, 2008), nowadays it is mainly considered as a resource for innovation (Pratt and Jeffcutt, 2009). Creative industries have become a driver for the wider economy (Bakshi, McVittie and Simmie, 2008) whilst innovation for cultural entities and non-profit organizations has found a first codification (Bakhshi and Throsby, 2010).

The social and local dimension of creativity is rapidly asserting itself, making the relationship between creativity, community and place all the more relevant (Perry-Smith and Shalley, 2003; Drake, 2003). The main underlying hypothesis is that ideas and innovations develop more easily in informal settings and public spaces – whether they be physical places such as cities of art and industrial districts or virtual spaces like online social networks such as Facebook and Twitter (Piore 2009: 331–343; Lazzeretti, Capone and Cinti, 2011). These observations must be seen in connection with the emerging open innovation paradigm, which stresses the role of creative contexts and external knowledge in addition (or in replacement of) to knowledge created in internal R&D labs (Chesbrough, Vanhaverbeke and West, 2006; Dahlander and Gann, 2010).

At the same time, evolutionary economic geography has applied the concept of firms' absorptive capacity (Cohen and Levinthal, 1990; Zahra and George, 2002) to industry clusters, cities and regional innovation systems. New types of transversal, path dependent innovations are discussed according to the related variety approach (Cooke, Asheim and Boschma, 2011). If following Cohen and Levinthal (1990), the absorptive capacity (AC) is the ability of a firm to understand and absorb external knowledge, dependently on its own knowledge base, cluster AC (Giuliani, 2005) corresponds to its ability to identify, assimilate and exploit knowledge coming from external

sources. Frenken, van Oort and Verbung (2007) refer to inter-sector AC linked to the related variety approach, thus broadening this perspective to cities and regions. Finally, Lazzeretti (2009) relates this concept to the creative economy and to cities considered as new creative milieux. She defines *creative absorptive capacity* the ability to transform generic creativity (exploration) into a goal-oriented one (exploitation), so as to generate and transfer ideas and innovations. Such a capacity depends on the tacit knowledge accumulated within a creative habitat and on the path dependence from creative actors.

Over the last decade, the variety of contributions to the debate has further enriched thanks to the ecological approach with to its application of the concept of resilience to social systems (Vale and Campanella, 2005; Pendall et al., 2008). Resilience, adaptability and transformability are considered as the three related attributes of social-ecological systems that determine their future trajectories (Walker et al., 2004).[1]

Swanstrom (2008) explores the value of the resilience framework for thinking about how metropolitan areas respond to challenges, stating that resilience can be understood as a process that takes place in three distinct sectors: private, public and civic (or non profit). Simmie and Martin (2010) review the different definitions of resilience and their potential application to explaining the long-term development of urban and regional economies, applying the adaptive cycle model from panarchy theory to the Cambridge and Swansea city-region economies. They distinguish between the concepts of 'engineering' and 'ecological resilience'. The first notion seems closer to the notion of 'elasticity', that is the ability of a system to absorb and accommodate perturbation without experiencing major structural transformations. The second notion focuses on whether disturbances and shocks cause a system to move into another regime of behaviour, linking resilience with the idea of adaptability that is fruitable in its evolutionary scope (McGlade et al., 2006). Finally, Cooke et al. (2012) focus on the relationship between innovation, global change and territorial resilience, arguing that local and national territories have to improve both their competitiveness and their capability to innovate though the continuous upgrade of policy platforms.

In this chapter, we aim to contribute to the still under-researched debate on urban and regional economic resilience by proposing some reflections focused on cities of art. In particular, we aim to study the stable resilience of cities of art facing the challenge of the second modernity and the globalization process.

[1] *Resilience* is defined as the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks, including four components – latitude, resistance, precariousness, and panarchy – most readily portrayed using the metaphor of a stability landscape. *Adaptability* is the capacity of actors in the system to influence resilience (in a socio-economic system, essentially to manage it). There are four general ways in which this can be done, corresponding to the four aspects of resilience. *Transformability* is the capacity to create a fundamentally new system when ecological, economic, or social structures make the existing system untenable (Walker et al., 2004: 2-5).

According to Holling (1973), resilience is not only the capacity to absorb shocks and maintain function, but it also includes a second aspect concerning the capacity for renewal, re-organization and development, to be taken in consideration for redesigning a sustainable future. In this sense, we discuss the idea that some creative cities are also resilient cities as they are capable not only of preserving and economically enhancing their material and immaterial cultural and artistic heritage, but also of transforming themselves in response to external pressures, generating local development and growth.

Following the concept of *creative capacity of culture*, we consider the city of art as an informal, collective open space that can absorb and recombine art and culture leading to novelty and renewing (Lazzeretti, 2009, 2012). We present and discuss three case studies of lateral, transversal and path-dependent innovation occurring in Florence through cross-fertilization and serendipity between cultural and creative clusters, museums and art restoration centres. We look for an 'innovation Renaissance' combining arts and sciences as a result of a commonly-shared and embedded value.

The chapter is structured as follows. After this introduction, the second paragraph synthesizes the main risks that artistic and creative cities need to face in the second modernity, with a particular reference to the loss of meanings and authenticity. We then propose to overcome such threats by considering Florence as a resilient city capable of turning risks into opportunities by going back to its Renaissance roots in order to establish a new proactive creative milieu. In the third paragraph, three cases of heritage- and science-driven discoveries and innovations are described: the 'Florence and Science' exhibition and the network of scientific museums, the innovation of laser technologies for the conservation of artworks and, finally, the discovery of the Stendhal syndrome. Some concluding remarks on the creative capacity of culture and on cities of art considered as creative and resilient cities are provided at the end of the chapter.

2 The risks of second modernity and cities of art

2.1 The risks of second modernity: an overview

The start of this millennium sees profound changes marked by the emerging of new technological, productive and consumption paradigms and by the diffusion of a pervasive sense of uncertainty. The sustainability of cities has become a relevant question for post-modern societies (Cooke, 1990), characterized by the transition from a 'solid', 'tangible' Fordist model of capitalism to the 'liquid'

and intangible post-Fordist paradigm of knowledge economy (Bauman, 2000). In this context, the question we ask ourselves is: Which are the risks for cities of art facing the new globalization challenges?

We can here identify two main categories of risks: the first related to the condition of 'surmodernité' (Augé, 1992) and the second connected to 'environmental concerns'. There are also more specific risks, caused by the excesses in the economic enhancement of the artistic heritage, that can be brought back, in broad terms, to one of these two categories.

Specifically, to the first category refers the 'risk of a loss of meanings and authenticity' that involves cities and towns endowed with – and identified by – a tangible or intangible artistic and cultural heritage. Due to its relevance for the present discussion, this will be discussed in more detail in the next paragraph.

As regards the second category, we can only briefly recall the sustainability risks involved in pollution, environmental degradation and catastrophic events (floods, earthquakes, eco-terrorist acts, etc.) that have intensified in recent times. In this context, cities of art have been particularly subject to the increasing pressure of tourism, that impacts on the conservation of cultural goods, their fruition, and the quality of local environment (UNWTO 2004a, 2004b). The necessity to promote sustainable and responsible fruition and a smarter management of tourist flows is a priority need which is widely recognized at different scales of governance (Chabra, 2010).

As regards the risks deriving from the economic enhancement of culture, which affect both the supply and the demand of cultural goods, we may recall the improper management of cultural heritage (monuments, mobile and immobile assets) and organizations (museums, theatres, etc.), as well as the governance of small-medium cities of art. Some authors have raised concerns about the 'disneyfication' (Zukin, 1993) or 'serial reproduction' of culture (Richards and Wilson, 2006), whilst others have discussed the risks of an application of managerial practices to cultural organizations, and also the excesses of place branding and marketing of cultural goods (Colbert, 2009). These add to the demand-driven risks, which are related to the excess in the search for and accumulation of cultural experiences and to the consequent improper consumption behaviours of tourists and citizens.

All of these risks, that can be only briefly listed here, require a strengthened commitment to the conservation and protection of the cultural heritage incorporated in cities of art, which is necessary if they are to still represent not only high-culture places but also creative and resilient milieux. Each risk mentioned above is surely worth a specific deepening, but because of space limits we will only explore the first, and basically more general and all-embracing, category.

2.2 The risk of a loss of meaning and authenticity

The main threats emerging from globalization can be brought back to the condition that Marc Augé (1992) has defined as 'surmodernité', which implies the excesses of time (embodied by the sensation of 'imminent history'), space (with the rise of 'non-places') and ego (witnessed by individualization processes).[2] In particular, non-places distinguish themselves for being anonymous and impersonal due to their lack of history and their transit function (examples are underground stations and airports). Places, instead, are located in the vital centre of cities where the memory of the past is concentrated, such as cities of art. The condition of *surmodernité* implies a loss of meaning which manifests itself in a loss of identity, relations and history (Lazzeretti, 2005).

Therefore, cities of art and museums are places loaded with meanings, but may see their identity vanishing for several reasons, such as the failure of their most qualifying functions, the loss of meaning of the broader context in which they are placed, the improper management decisions or the unsustainable behaviours of tourists and citizen visitors.

For instance, some museums can dismiss their characterizing functions of conservation and transmission of knowledge to become mere stages of entertainment, trade and consumption. Some cities can cease being places of life and work to turn into open-air museums (think of the so-called 'Venice effect') from which tourists have displaced native residents (Costa and Manente, 1995). This process has sometimes been labelled altogether as a process of 'tourismification' (Ashworth and Turnbridge, 1990) of historical centres (Caserta and Russo, 2003) which is typically associated with a loss of authenticity and commoditization of the tourist (and the residents') experience.

In this context, the superabundance and excesses of economic enhancement of culture, place branding and experience economy may alter the idiosyncratic values of territories (Gilmore and Pine, 2007). For instance, the 'society of events' sees the rapid multiplication of small and big festivals and happenings in every period of the year, an accumulation which may denature the soul of the town by transforming it into a mere stage of entertainment.

In contrast, economists, geographers and sociologists increasingly stress the importance of authenticity and the safeguard of the identity of places and their traditions.

The identity of a place is fundamental for the individuals' creativity, and research on artists suggests that place provides a single surface against which the artist constructs a sense of the self.

[2] These three excesses, consisting in a superabundance of events and spaces, and in over-referencing, find their fullest expressions in non-places. The excess of time is a redundancy of events in the contemporary world, which causes the individuals to have difficulties in giving meaning to the imminent past because they are too much applied to overabundant present events. The excess of space consists in a redundancy of places, mainly caused by the revolution in transportation, the shortening of distances and the multiplication of impersonal places. The third excess implies that individual stories are increasingly implicated in collective history, entailing the risks of a personalistic use of history (Augé, 1992: 32-41).

The identity of creative workers is place-based but not place-bound (Staber, 2012). Authenticity is a value to preserve also at an industry level, as shown for example by the case of Swiss watchmaking, where mechanical watches represent the frontier of today's technical and cultural authenticity while constituting the major export value of this industry (Jeannerat and Crevoisier, 2012). Authenticity and experience economy have to be correctly balanced. Indeed, the value of the experience for the consumer is somewhat related to the fact that it happens in that specific place (Lorentzen, 2009). A crucial aspect, in this sense, is that establishing a real connection with the place enables the authenticity of the experience (Lorentzen, 2009).

In the post-industrial era, the sense of place reflects geographical mobility, social construction and marketing strategies that contribute to creating or re-creating a distinctive and authentic sense of place. Our changing tastes remake the urban landscape of the 'naked city', as Sharon Zukin describes referring to the Starbucks stores. Cities transform themselves and their authenticity needs to be searched not just in their symbolic landmarks (such as the skyscrapers of Manhattan), but rather in the cultural vitality of its streets and everyday life (Zukin, 2010).

2.3 How to transform risks into opportunities?

Starting to discuss our hypothesis to consider cities of art as resilient ecological systems, we focus on Florence, that is one of our privileged fields of investigation. Building on our previous research on culture and creativity, we searched for innovations implemented within this town with the involvement of activities and actors belonging to the domain of culture, art and science in a sort of 'new Renaissance' path. We thus defined as 'Renaissance innovations' those innovative paths between art and science that seem guided by the combinatory capacity of culture and which found a favourable environment in local networks and clusters.

By analyzing these innovations, we searched for links with the three categories of risks identified above, and showed how new types of problems open to unpredicted opportunities.

The cases were categorized according to four types of innovation between renewing and novelty: (a) urban renewal, that pertains to the idea that culture can rejuvenate places through three main strategies (city branding, physical renovation and flagship developments, and culture-led strategies); (b) economic renewal, that relates to the idea that culture can rejuvenate not only places, but also mature or declining products, professions, *filières* and sectors; (c) cross-fertilization, i.e. the ability to search and build new relationships among 'related' or 'unrelated' sectors; (d) serendipity, i.e. the capacity of discovering pleasing or valuable things by chance, identifying unusual

correlations which may lead to new uses of a product, multiplicity of interests or technological correlations (Lazzeretti, 2009).

In the attempt to identify a common Renaissance path to the innovations examined in our case studies, we referred to the seminal work of Padget and McLean (2006), 'Organizational invention and elite transformation: The birth of partnership systems in Renaissance Florence'. In their paper, these authors analyze, using a network approach, the birth of the 'partnership system' in Renaissance Florence as a new form of organization. Their aim is to unveil the social process of invention in action in this creative place: inventions in literature (Dante, Boccaccio, Petrarca), in art (Giotto, Masaccio, Donatello, Michelangelo), in architecture (Brunelleschi, Alberti), in science (Leonardo, Galileo), in constitutional design (Bruni, Savonarola), and in business (Datini) were in fact produced in breathtaking numbers and speed. In this context, 'the most striking global feature about Renaissance Florence' is identified in 'the sheer multiplicity of domains in which inventions occurred: inventions seemed to cascade from one domain to another' (Padget and McLean 2006: 1465).

Starting from these suggestions, we aim to understand if something of this process is still present in the mechanisms of creativity that occur in contemporary Florence. In view of that we studied three cases and linked them to the risks of second modernity.

The first case regards the 'Florence and Science' exhibition and the network of scientific museums. As will be argued, this represents a case of urban economic renewal which faces the challenge of a 'loss of meaning' through the safeguard of the local scientific tradition. Florence, in fact, has been in the past a primary scientific centre, and the identification of a local network of scientific museums represents not only a case of economic enhancement of culture, but also a chance for renewing the *filière* of scientific education starting from primary school up to university.

The second case focuses on laser technologies for the conservation of artworks, an innovation that took the lead from the dramatic floods of Venice and Florence in 1966. Serendipitously originated by the need to face environmental risks, over two decades it has become a successful innovation through the cross-fertilization among creative actors of the Florentine restoration cluster.

The last case concerns the Stendhal syndrome: this was a discovery made through serendipity that has contributed to the development of the new discipline of art psychology, also opening up new frontiers to art therapy. It can be considered as a response to the aforementioned excesses of the economic enhancement of culture in terms of art fruition, whose 'aesthetic overload' can also have negative effects on the psycho-physic conditions of visitors. The discovery has been made possible by the 'multiplicity of interests' of the team coordinated by Professor Magherini and it has

been favoured by the physical proximity between the hospitals and the museums, both located in the centre of Florence.

In the following paragraph, the histories of each innovations are synthesized.

3 Back to Florence Renaissance: three innovation cases

3.1 Case of renewal of city image and cultural *filières*: 'Florence and Science'

An interesting case of urban regeneration based on cultural events is the exhibition 'Florence and Science. The 19th-century collections, places and personalities' held in Florence in 2010.[3] The main goal of the initiative was to renew and promote the image of Florence not only as a city of artistic and historical heritage, mostly from the Renaissance, but also as the intellectual capital of Italy, and one of the most lively European scientific centres of the 19th century. The event was organized as a sequence of four interconnected exhibitions: the main scientific museums in the historical centre exposed rare scientific instruments belonging to the collections of the Medici and Lorena families, while the prestigious venue of Palazzo Medici Riccardi evoked the cultural climate of the pre-unification season through artworks and historic documents. Overall, the results of 'Florence and Science' were more than satisfactory, receiving a total of 104,000 visitors.

The event was studied according to the following objectives:

– analyze the cultural and economic role of the exhibition in connection with the demand and the local territory;

– understand whether it represented just a temporary promotion initiative, or it was rather the 'top of the iceberg' of a permanent network of museums and creative actors focusing on the promotion of scientific culture and education.

In the first step of analysis, the profile of visitors was analyzed through 133 questionnaires administered at the end of the visit.[4] It emerged that the audience of the exhibition was mostly composed by families (27 per cent) living in the area of Florence (55 per cent), endowed with a high level of education (38 per cent of graduates), a specific interest in the exhibition theme (52.6

[3] The event was promoted by the Foundation of Cassa di Risparmio di Firenze, which networked four Florentine museums for the period 1st November 2009-9 May 2010 with the following initiatives: Palazzo Medici Riccardi with the exhibition 'Florence, 1829. Art, science and society'; "La Specola" Zoology section of the Museum of Natural History of the University of Florence with the exhibition 'The tribune of Galileo and the Florentine La Specola'; the Science and Technology Foundation - Physics Cabinet, with the exhibition 'Educational methods for science in the 19th century'.

[4] The questionnaire was developed by the Foundation of Cassa di Risparmio di Firenze, and it was then worked out by us. The percentages in the age groups of the sample resulted as follows: 31–50 years, 29 per cent; 51–70 years, 28 per cent; 12–18 years, 15 per cent; 19–30 years, 13.5 per cent; under 12 years, 11 per cent; over 70 years, 3.5 per cent.

per cent) and a strong propensity to return and/or visit all of the exhibitions (71.4 per cent). These results attested the strong appeal of 'Florence and Science' for the local community – especially compared to the more tourist-oriented events held in Florence – and witnessed the function of the scientific museum as a place of social aggregation.

In the second step of analysis, the investigation on the supply side was extended to all of the 34 scientific exhibitions held in the area of Florence from 2000 to 2010, in order to evaluate the scientific museums' capability to activate relationships of various nature with different actors, both within and across the local territory.[5] To this purpose, we mapped the number and types of actors involved, and applied the social network analysis (Wasserman and Faust, 1994) to identify the relations connecting museums among each other, with the relevant local bodies (cultural and creative organizations, local institutions, non-profit associations) and the external stakeholders.

A total of 480 actors were identified and classified according to the function played in the organization of the exhibition (direction/management; patronage; financial and technical support; loans and related activities; arrangement of the exhibition; catalogue; diagnostics, restoration and consultancy for conservation; other services). Interestingly, the dataset of actors is mostly represented by non-profit organizations (51 per cent) based in Tuscany (50.1 per cent), witnessing that other-than-economic motivations played a relevant role in the organization and activated a network of regionally-embedded relations.

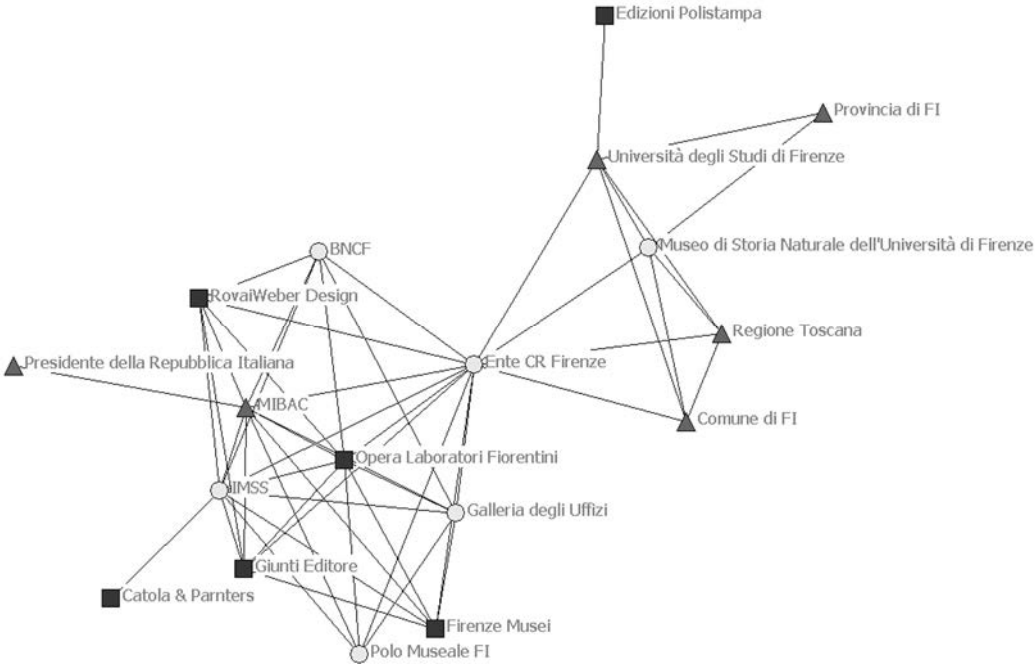
In the overall network, by considering a high level of co-participation (with at least six exhibitions; see Fig. 1), what emerges is that the gatekeeper role was played by the bank foundation, which connects with each other the two main venues and organizers – the Galileo Museum and the Museum of Natural History of the University of Florence – as well as the two main patrons – the Ministry of Culture and the Tuscany Region. To a closer focus, the two groups of actors present distinct characteristics: that centred upon the Galileo Museum includes small- and middle-sized firms, active in the promotion and economic enhancement of scientific heritage. The one related to the Museum of Natural History, instead, interacts more with the local and regional institutions and seems more embedded in a *filière* of scientific knowledge and education, including the University.

Two different functions of cultural and scientific heritage seem to be at play here. In the first network, culture can be dealt with as a resource to be economically enhanced through promotion and image-oriented strategies, while in the second, it can also contribute to stimulate an open conversation between cultural institutions, firms and the local community, combining humanities and scientific knowledge with potentially beneficial effects on territorially-embedded creativity.

[5] The original database, used in Lazzeretti and Cinti (2009), was updated and developed in order to apply specifically to scientific museums. The first data are presented here.

We have here a case of urban and economic rejuvenation that constitutes a possible reaction to the challenges of 'losing meaning' and to the preservation of the city's scientific identity.

Figure 1 – The network of actors with $c \geq 6$



Legend: The different shades of gray of the nodes indicate the *site* (dark grey for Tuscany, light grey for the rest of Italy, black for Europe); the different shapes of the nodes show the *typology* (a triangle for research centres, a square for universities, a circle for firms); the *dimension* of each node is a proportional representation of the financial resources received. The value expressed by 'c' stands for the minimum number of projects shared by each couple of actors.
Source: our elaboration.

3.2 Case of cross-fertilization: laser technologies for conservation[6]

The application of laser for the restoration of cultural property started off in the Seventies, with the works of John Asmus (Asmus, Murphy and Munk, 1973), who first tested the potentialities of laser in cleaning a column in the church of St. Gregory in Venice. Asmus realized that the ruby laser technique, usually applied to holographic processes, could be also applied for cleaning frescoed surfaces. This 'accidental' discovery led Asmus to develop a series of tests on several materials, which he undertook in between 1972 and 1974. The importance and high potential of this technology was soon understood all over Europe, and in the subsequent years the countries with the

[6] This paragraph represents a synthesis of our works (Lazzeretti, Capone and Cinti, 2011; Lazzeretti and Cinti, 2012), to which we refer for further details and bibliographical references.

greatest cultural endowments started to plan and implement activities aimed at developing the use of laser. However, it was not before the mid-Nineties (1994), with the approval of two European projects, that it was possible to implement the serial production of the first neodymium laser, which used the optic fibre to transport radiation to the light-emitting hand-piece. In 1995, the first conference on *Lasers in Conservation of Artworks* (*LACONA*) was held in Crete, gathering an international community composed of physicists specialized in restoration of cultural heritage, restorers and developer enterprises, which since then meet regularly every two years.

In Europe, many initiatives to develop laser-technology tests were undertaken, often funded by the European Union. However, although there has been a wide experimentation to appreciate the impact of using lasers in the preservation of cultural heritage, by the late Nineties, in Europe, there was no well-developed laser system for restoration fully accredited from restorers and conservators.

In this situation, Tuscany reveals to have been the context where the strongest commitment was shown and the best results achieved in the testing of the laser technology for preserving and restoring cultural and art works. This undertaking was made by a public body, the Opificio delle Pietre Dure (OPD) – a centre of excellence in restoration headquartered in Florence – that made a first attempt of technological transfer at a local firm back in 1979. Although the result of the application of a CO2 laser was not encouraging, because the laser was over-powerful and the marble would absorb too heat, this first test gave the opportunity to make OPD more aware of the use of laser.

In 1992, OPD established a collaboration with the Institute of Applied Physics (IFAC) which was at first addressed at the cleaning of repaint, and later extended to stone materials. This experience encouraged OPD to deem feasible the design of a more proper device. IFAC, endowed with specific competencies in laser technology, suggested that the ideal implementer of such a programme was El.En., a firm specialized in biomedical also located in Florence. To this purpose, the SMART CLEAN project was started and led to the development of a new laser system, whose effects on different materials were too analyzed. The partnership of the El.En. group in the project represented a significant factor in the effort, as the Florentine firm with an internationally-recognized know-how in medical ablation techniques using lasers, offered the opportunity to plan a low-cost implementation of the product, which could very well be included in its batch production of biomedical lasers.

Accordingly, in 1996, the physicists started an extensive stage of analysis mostly conducted on stone materials, which allowed El.En. to create a new laser product, modified in both its impulse and duration. The last, but not least, contribution to the innovation process was brought by local

institutions, which grabbed the opportunity offered by the new technology by supporting its application to the restoration of local artworks.

The laboratory tests of laser application were carried out on an assorted typology of archaeological materials in stone and metal, particularly bronzes.[7]

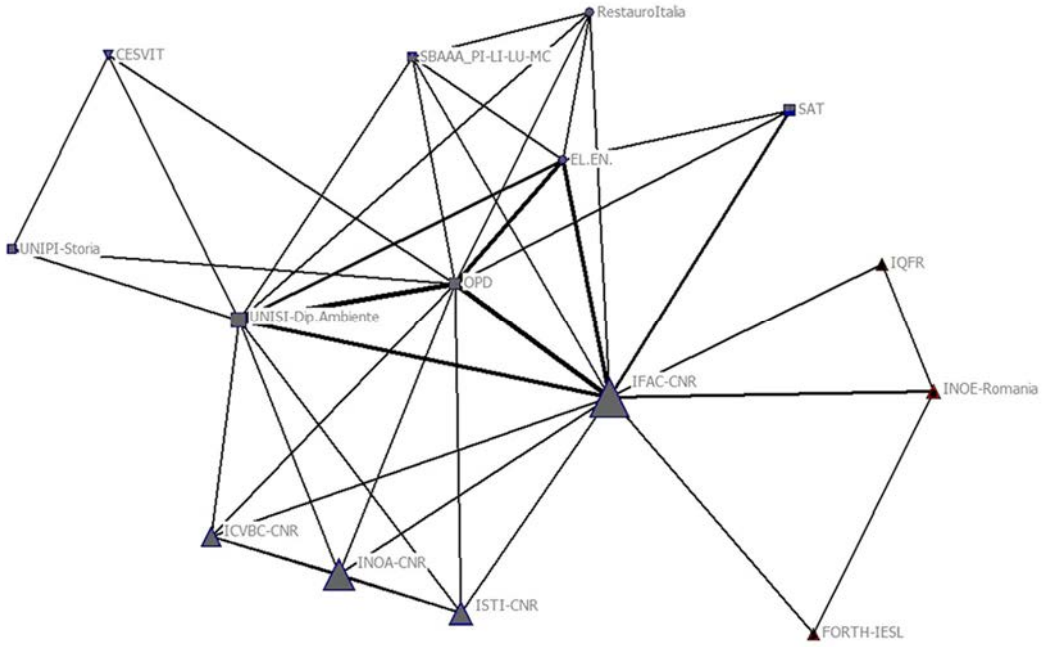
As can be seen, the innovative idea originally emerged from a case of serendipity – the application to holograms resulting in the unpredicted use of laser to cleaning purposes – and later developed through a cross-fertilization between seemingly unrelated sectors like medical diagnostics and cultural heritage. Therefore, this represents a significant case of an open innovation carried out by a creative cluster of economic, non economic and institutional actors who found in Florence a resourceful environment for its implementation. In this cluster, territorial proximity successfully combines with cognitive proximity, whose positive effects are grounded not only on the interaction between the organizations involved, but also on the crossing and matching of the professional and cultural paths (*human dependence*) of scientists, art curators and historians, as well as firms and institutions.

To reconstruct the frame of the partnership system that developed the innovation of laser technologies in conservation, we have selected the 12 financed projects that took the most part in its constitution. The chief contributing creative actors that emerged from the analysis were the El.En. group in particular, together with the conservation-restoration institute (OPD), the Department of Environmental Sciences of Siena University, and finally the IFAC, all of them playing a central bridging role among all the other actors (Fig. 2).

This innovation, which takes origin from the tragic events of the Venice and Florence floods, certainly represents an example of a proactive capacity of answering to environmental risk on the part of the city of Florence.

[7] Thirteen items were successfully restored, including masterworks such as the famous Donatello's David – restored in 2008 and re-exhibited in 2009 – and of Lorenzo Ghiberti's Gate of Paradise at St. John's Baptistry, whose cleaning is still ongoing.

Figure 2 – The network of actors in laser restoration (c ≥ 2)



Legend: The different shades of gray of the nodes indicate the *site* (dark grey for Tuscany, black for Europe); the different shapes of the nodes show the *typology* (a triangle for research centres, a square for universities, a circle for firms); the *dimension* of each node is a proportional representation of the financial resources received. The value expressed by 'c' stands for the minimum number of projects shared by each couple of actors.
Source: our elaboration.

3.3. Case of discovery: the Stendhal syndrome

The denomination of Stendhal syndrome represents a state of perturbation perceived by foreign tourists at cities of art, which was analyzed by the Florentine psychoanalyst and art historian Graziella Magherini over more than two decades of observation.

This syndrome, named after the French writer Stendhal, was first described by professor Magherini as an exceptionally intense and involving aesthetic experience followed by a sense of malaise while visiting Florence during his Grand Tour in 1817. As in Stendhal's case, the particular intenseness of the aesthetic experience lived by the visitor of sites charged with deep cultural and symbolic elements – such as Florence – is the factor lying at the basis of a wide array of psychical and psycho-somatic disturbances. Through the clinical observation of 106 cases at the Hospital of Santa Maria Nuova in the period from 1977 to 1986 (Magherini, 1989), their symptoms were classified within the following categories:

– *disturbances of thought* (66 per cent of the patients), associated with alterations of perception and sense of reality, dizziness, hallucination, delirium;

– *disturbances of feelings and affections* (29 per cent), i.e. depressive anxiety, sense of hollowness and precariousness/euphoria, and omnipotent thought;

– *panic attacks and somatized anxiety* (5 per cent) with physical manifestations, such as palpitation and faintness.

As regards the profile of the visitors affected by the syndrome, the whole sample of patients is composed by foreigners (100 per cent), quite fairly split among male (44 per cent) and female (56 per cent), mostly young (76 per cent under 40 years) and single (89 per cent of females and 65 per cent of males). The affected tourists are typically endowed with a lower educational and professional status compared to the average of visitors in Florence and are mostly visiting the city on an individual tour (76 per cent).

According to Magherini (1989), the travel experience, allowing freedom from social obligations and constraints (frequently amplified by the solitude of the individual traveller), makes people both more receptive towards external stimuli and more inclined to introspection. During the trip, the protection afforded by the habits and conventions that regulate the visitor's daily life at home is no longer available and the impact of new experiences can thus be radical: as a result, latent conflicts in personality (e.g. senses vs rationality; Ego vs Super-ego) rooted in past events are more likely to come to the surface, often bursting in open identity crisis.

In synthesis, the triad *personal history-trip-aesthetic experience* is at the origin of the disturbances. Recurring elements in the reports are the feeling of novelty – partly anticipated through books, but never fully predictable – lived by visitors when staring at the paintings at the Uffizi or the Academy Gallery, alongside with the extraordinarily contemporary appeal of the past. Such intense beauty cannot be rationally dominated or appropriated: therefore, the spectator may feel the urge to immerse him/herself in the artwork in order to penetrate its enigma. His personality, then, may overflow into the painting in a sort of artistic ecstasy, needing to be reorganized by appealing to familiar experiences and 'ancient certitudes' such as in Stendhal's case (Magherini, 1989: 589). In this case, the crisis can represent a positive event, allowing to expand the tourist's personality by reintegrating previously repressed components. Consistently, the majority of cases resolves with the end of the trip and the safe return at home; only acute disturbances of thought have a longer course and entail more often the interruption of the trip.

The implications of the Stendhal syndrome are manifold and significant, and have opened a fully new stream of research. Analogous disturbances, namely the Paris (Viala et al., 2004) and the Jerusalem syndromes (Bar-El et. al., 2000) have been then identified, fuelling an international

debate among psychologists and psychoanalysts (Halim, 2009). The former is a transient psychological disorder encountered by tourists in Paris, which manifests itself through acute psychosomatic manifestations such as dizziness, tachycardia and sweating. Japanese visitors have been observed to be especially susceptible, the main antecedents of the syndrome being represented by cultural distance with the country and the formation of idealized pre-images of Paris.

The origins of the latter are different, as it involves people who feel compelled to visit Jerusalem by severe religious or magic-related psychotic obsessions, such as identification with religious characters. Yet, a group of patients is composed by regular tourists with no personal track of psychotic illness, who suffer from acute episodes while in Jerusalem and recover spontaneously.

Over the last two decades, Graziella Magherini has pursued her studies on the Stendhal syndrome (Magherini, 2007) and on the psychological aspects of the aesthetic experience. She has also founded in 2000, and currently chairs, the International Association of Art Psychology, aiming to promote studies on the relationship between psychology and arts and which is now developing into the related fields of art therapy, aesthetic education and study of psychoanalytic aspects in literature.

This discovery may be considered as an answer to the risks of the economic enhancement of art from the point of view of its fruition. An 'excess of beauty', that is the aesthetic overload, can indeed have not only positive, but also negative consequences.

4 Concluding remarks

To conclude, we make some reflections on the resilience of cities of art, by referring to the lesson learnt with Holling's (1973) definition: resilience is not just the capacity to absorb shocks and still maintain function, it can been from another side that concerns the capacity for renewal, re-organization and development, which deserves consideration for the redesigning of a sustainable future. We discussed this idea with respect to the risks emerging from the globalization process, noting that the creative capacity of culture can turn some of these threats into opportunities. To this purpose, we identified discoveries and innovations that find their common ground in a 'Renaissance' path winding between arts and science.

The remarkable resilience of cities of art can firstly be recognized in the presence of a historical and artistic heritage, and in the capacity of the local milieu to absorb shocks by safeguarding its identity, relationships and history – thus facing the main risk involved in the second modernity, that of losing meanings and authenticity. Secondly, the creative capacity of the city for renewal, re-

organization and development can be traced back to the propensity of creative actors – whether individually or organized in networks or clusters – to develop heritage-driven innovations. The most fitting example of resilience is surely that of laser technologies for the conservation of artworks, an innovation born through serendipity and developed through cross-fertilization in the face of 'environmental risks', like the 1966 flood, as recalled in the above paragraphs.

In some way the 'partnership system' identified by Padget and McLean (2006) in Renaissance seems to be still active to a certain extent, in the involvement of a multiplicity of economic, scientific and artistic activities. The occurrence of a social process of innovation is confirmed by the analyzed cases, which can be classified as examples of open innovation wherein the role of the urban creative milieu is pivotal in activating multiple paths. Nonetheless, differently from Padget and McLean, we have not yet identified a 'cascade effect' between different innovations.

The presence of a network of scientific museums as emerged through the study of the 'Florence and Science' exhibition is an important signal to be further investigated. It not only demonstrates that culture can produce economic development and innovation – as in the case of the Galileo Museum, which has been recently awarded for its excellence in the presentation of items[8] – but it also opens up new ways of performing the traditional task of preserving, producing and spreading knowledge. As in the case of the Museum of Natural History of the University of Florence, the aim is to revitalize the museum as a public space and as a key actor in the *filières* of scientific knowledge, through the organization of a variety of events primarily addressed to families, schools and the citizenry.

Finally, the Stendhal syndrome represents a case in which the 'multiplicity of knowledge' stimulated an important scientific finding. Even if this has not produced significant effects in therapy yet – differently from what occurred, for instance, in the case of the Mozart effect (Sacks, 2007) – nonetheless it has provided significant advances in research through the potentially fruitful alliance of medicine and arts.

The research path that we have just started is surely complex. We should search for further cases of 'Renaissance innovation' also to analyze their possible interrelations. Yet, we believe that the approach to resilience we have just started to take into account here constitutes an important perspective of analysis if we wish to understand whether looking at the past may be an effective strategy to build sustainable models of development for this new millennium.

[8] The Galileo Museum has been awarded by the European Museum Academy in 2011, in recognition of its noteworthy collection as well as of its peculiar way of exposing it, which combines the traditional means with the new ICTs and multimedia tools.

References

Andersson, D.E., Andersson, Å.E. and Mellander, C. (eds) (2011), *Handbook of Creative Cities*, Cheltenham: Edward Elgar.

Ashworth, G.J. and Turnbridge, J.E. (1990), *The Tourist-historic City*, London: Belhaven Press.

Asmus, J.F., Murphy, C.G. and Munk, W.H. (1973), 'Studies on the interaction of laser radiation with art artefacts', in R.F. Wuerker (ed.), *Developments in Laser Technology II*, Proc. SPIE 41, pp. 19–30.

Augé, M. (1992), *Non-lieux: Introduction à une antropologie de surmodernitè*, Paris: Seuil.

Bakhshi, H. and Throsby, D. (2010), *Culture of Innovation: An economic analysis of innovation in arts and cultural organisations*, London: NESTA.

Bakshi, H., McVittie, E. and Simmie, J. (2008), *Creating Innovation: Do the Creative Industries Support Innovation in the Wider Economy?*, London: NESTA.

Bar-El, Y., Durst, R., Katz, G., Zislin, J., Strauss, Z. and Knobler, H.Y. (2000), 'Jerusalem Syndrome', *The British Journal of Psychiatry*, 176, 86–90.

Bauman, Z. (2000), *Liquid Modernity*, Cambridge: Polity Press.

Belussi, F. and Staber, U. (eds) (2012), *Networks of Creativity and Innovation*, London-New York: Routledge.

Caserta, S. and Russo, A.P. (2002), 'More means worse. Asymmetric information, spatial displacement and sustainable heritage tourism', *Journal of Cultural Economics*, 26(4): 245–60.

Chabra, D. (2010), *Sustainable Marketing of Cultural and Heritage Tourism*, London: Routledge.

Chapain, C., Cooke, P., De Propris, L., MacNeill, S. and Garcia, J.M.(2010), *Creative Clusters and Innovation*, London: NESTA.

Chesbrough, H.W., Vanhaverbeke, W. and West, J. (2006), *Open Innovation: Researching a New Paradigm*, New York: Oxford University Press.

Cohen, W. and Levinthal, D. (1990), 'Absorptive capacity: A new perspective on learning and innovation', *Administrative Science Quarterly*, 35(1): 128–52.

Colbert, F. (2009), *Beyond Branding: Contemporary Marketing Challenges for Arts Organizations*, Kenneth Myer Lecture in Arts and Entertainment Management, Deakin University, 7 May.

Cooke, P. (1990), *Back to the Future: Modernity, Postmodernity, and Locality*, London: Unwin Hyman.

Cooke, P. and Lazzeretti, L. (eds) (2008), *Creative Cities, Cultural Clusters and Local Economic Development*, Cheltenham, UK: Edward Elgar.

Cooke, P., Asheim, B.T. and Boschma, R. (eds) (2011), *Handbook of Regional Innovation and Growth*, Cheltenham, UK: Edward Elgar.

Cooke, P., Parrilli, M.D. and Curbelo, J.L. (eds) (2012), *Innovation, Global Change and Territorial Resilience*, Cheltenham, UK: Edward Elgar.

Costa, P. and Manente, M. (1995), 'Managing excursionists flow. The case of Venice', *Journal of Travel & Tourism Marketing*, 4(3): 201–19.

Dahlander, L. and Gann , D.M.(2010), 'How open is innovation?', *Research Policy*, 39: 699–709.

Drake, G. (2003), '"This place gives me space": Place and creativity in the creative industries', *Geoforum*, 34: 511–24.

Feldman, M.P. and Audretsch, D.B. (1999), 'Innovation in cities: Science-based diversity, specialization, and localized competition', *European Economic Review*, 43: 409–29.

Florida, R. (2002), *The Rise of Creative Class*, New York: Basic Books.

Frenken, K., van Oort, F.G. and Verburg, T. (2007), 'Related variety, unrelated variety and regional economic growth', *Regional Studies*, 41(5): 685–97.

Gilmore, J.H. and Pine, B.J. (2007), *Authenticity: What Consumer Really Want*, Harvard: Harvard Business Press.

Giuliani E. (2005), 'Cluster absorptive capacity. Why do some clusters forge ahead and others lag behind?', *European Urban and Regional Studies*, 12(3): 269–88.

Halim, N. (2009), 'Mad tourists: The "vectors" and meanings of city-syndromes', in K. White (ed.), *Configuring Madness: Representation, Context and Meaning,* Oxford: Inter-Disciplinary Press.

Holling, C.S. (1973), 'Resilience and stability of ecological systems', *Annual Review of Ecology and Systematics*, 4(1): 1–23.

Jacobs, J. (1969), *The Economy of Cities*, New York: Random House.

Jeannerat, H. and Crevoisier, O. (2012), 'Cultural activities in territorial development: The case of cultural and creative enterprises in the Swiss watchmaking industry', in L. Lazzeretti (ed.), *Creativity and Innovation in Europe*, forthcoming, London: Routledge.

Lazzeretti, L. (2005), 'Città d'arte e musei come "luoghi di significati": una possibile risposta alle sfide della "surmodernità"', *Economia e politica industriale*, 16(1): 65–88.

Lazzeretti, L. (2009), 'The creative capacity of culture and the new creative milieu', in G. Becattini, M. Bellandi and L. De Propris (eds), *The Handbook of Industrial Districts*, Cheltenham, UK: Edward Elgar, pp. 281–94.

Lazzeretti, L. (2012), *Creative Industries and Innovation in Europe*, forthcoming, London: Routledge.

Lazzeretti, L. and Cinti, T. (2009), 'Governance-specific factors and cultural clusters: The case of Florence', *Creative Industries Journal*, 2(1): 19–36.

Lazzeretti, L. and Cinti, T. (2012), 'From cultural cluster to creative cluster: The case of art restoration in Florence', in L. Lazzeretti (ed.), *Creativity and Innovation in Europe*, forthcoming, London: Routledge.

Lazzeretti, L., Capone, F. and Cinti, T.(2011), 'Open innovation in city of art: The case of laser in conservation of artworks in Florence', *City, Culture and Society*, 2(3): 159–68.

Lorentzen, A. (2009), 'Cities in the experience economy', *European Planning Studies*, 17(6): 829–45.

Magherini, G. (1989), *La sindrome di Stendhal*, Florence: Ponte alle Grazie.

Magherini, G. (2007), *I've Fallen in Love with a Statue*, Florence: NICOMP.

McGlade, J., Murray, R., Baldwin, J., et al. (2006), 'Industrial resilience and decline: A co-evolutionary approach', in E. Garnsey and J. McGlade (eds), *Complexity and Co-Evolution: Continuity and Change in Socio-Economic Systems*, Cheltenham, UK: Edward Elgar, pp. 147–76.

Padget, J.F. and McLean, P.D. (2006), 'Organizational invention and elite transformation: The birth of partnership systems in Renaissance Florence', *American Journal of Sociology*, 111(5): 1463–1568.

Pendall, R., Foster, K.A., Cowell, M., et al. (2008), *Resilience and Regions: Building Understanding of the Metaphor*, mimeo, Institute of Urban and Regional Development, Ithaca, NY: Cornell University.

Perry-Smith, J.E. and Shalley, C.E. (2003), 'The social side of creativity: A static and dynamic social network perspective', *Academy of Management Review*, 28: 89–106.

Piore, M.J. (2009), 'Conceptualizing the dynamic of industrial district', in G. Becattini, M. Bellandi and L. De Propris (eds), *The Handbook of Industrial Districts*, Cheltenham, UK: Edward Elgar, pp. 259–68.

Pratt, A.C. and Jeffcutt, P. (2009), *Creativity, Innovation and the Cultural Economy*, London-New York: Routledge.

Richards, G. and Wilson, J. (2006), 'Developing creativity in tourist experiences: A solution to the serial reproduction of culture?', *Tourism Management*, 27: 1408–13.

Sacks, O. (2007), *Musicophilia: Tales of Music and the Brain*, New York: Alfred A. Knopf, London: Picador.

Simmie, J. and Martin, R. (2010), 'The economic resilience of regions: Towards an evolutionary approach', *Cambridge Journal of Regions, Economy and Society*, 3: 27–43.

Staber, U. (2012), 'Putting creativity in place: A relational and practice perspective', in L. Lazzeretti (ed.), *Creativity and innovation in Europe*, forthcoming, London: Routledge.

Swanstrom, T. (2008), *Regional Resilience: A Critical Examination of the Ecological Framework*, Working Paper 2008–07, Institute of Urban and Regional Development, University of California, Berkeley.

UNWTO – United Nations World Tourism Organization (2004a), *Indicators for Sustainable Development of Tourist Destinations*, Madrid: UNWTO.

UNWTO – United Nations World Tourism Organization (2004b), *Guidebook for Tourism Congestion Management at Natural and Cultural Heritage Sites*, Madrid: UNWTO.

Vale, L.J. and Campanella, T.J. (eds) (2005), *The Resilient City*, New York: Oxford University Press.

Viala, A., Ota, H., Vacheron, M.N., Martin, P. and Caroli, F. (2004), 'Les japonais en voyage pathologique à Paris: un modèle original de prise en charge transculturelle', *Nervure Journal de Psychiatrie*, 17(5): 31–4.

Walker, B., Holling, C.S., Carpenter, S.R. and Kinzig, A. (2004), 'Resilience, adaptability and transformability in social-ecological systems', *Ecology and Society*, 9(2): 5.

Wasserman, S. and Faust, K. (1994), *Social Network Analysis: Methods and Applications*, New York: Cambridge University Press.

Zahra, S. and George, G. (2002), 'Absorptive capacity: A review, reconceptualizazion and extension', *Academy Management Review*, 17(2): 185–203.

Zukin, S. (1993), *Landscapes of Power: From Detroit to Disney World*, Berkeley, CA: University of California Press.

Zukin, S. (2010), *Naked City: The Death and Life of Authentic Urban Places*, New York: Oxford University Press.