Rethinking the Creative City: The Role of Complexity, Networks and Interactions in the Urban Creative Economy

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Roberta Comunian

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Abstract

This article engages with the current research and debate about the creative city and the importance of cultural infrastructure in contemporary cities. It argues that much of the focus has been around the investment of cities in specific regeneration projects or flagship developments rather than addressing the nature of the infrastructure, networks and agents engaging in the city’s cultural development. The complexity theory and its associated principles can provide a new understanding of the connection between the urban space and the systems of local cultural production and consumption. Drawing on interviews with creative practitioners in the North East region of England, the paper argues that the cultural development of a city is a complex adaptive system. This finding has implications for both policy-makers and academic research. It emphasises the importance of micro interactions and networks between creative practitioners, the publicly supported cultural sector and the cultural infrastructure of the city.

1. Introduction

Cities have significantly invested in their cultural infrastructure and creative economies in the past two decades. Culture has been used as a means of urban regeneration (Evans and Shaw, 2004; M. Miles, 2005), economic development (Florida, 2002b; Scott, 2000, 2004) and social inclusion (Belfiore, 2002; Merli, 2002).

However, the approach of investing in creative economies has developed a new type of competition between cities. The focus of economic strategies and policy has been on what a city should have in order to be or to become ‘creative’. These policies are often replicated without taking into consideration the distinctive aspects of places and circumstances.

Authors have described the cultural dynamics of cities from different perspectives. Some have focused on cultural consumption (Jones and Wilks-Heeg, 2004; Molotch, 1996) and
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image (García, 2005), while others have looked at cultural production (Grabher, 2001; Pratt, 1997). However, very little attention has been given to the interactions between these two aspects (Chapain and Comunian, 2009; Hall, 2000, 2004; Pratt, 2008). Without a detailed understanding of these interactions, a misrepresentation of the potential economic value of the creative economy can be formed.

Standardised development formulas have been used to develop ‘creative cities’. These often take the form of a checklist of requirements such as a new art gallery, a media cluster or public art. However, no attention is then given to the process of cultural development. While these assets might provide an initial stimulus, what can sustain further cultural development?

The present paper draws on the principles of complexity theory (CT) to present the micro dynamics of the creative economy in NewcastleGateshead. It argues that the cultural development of a city is a complex adaptive system (CAS) responding to CT principles. While this implies a critique of a ‘one size fits all’, top-down policy, it encourages the use of a more agent-focused and interaction-based understanding for both researchers and policy-makers.

The paper continues with defining and understanding the concept of the creative city and its more recent interpretations. It then outlines the principles and limitations of CT and its previous association to creative economy literature. In the fourth section, the case study of NewcastleGateshead is presented and empirical materials are used to demonstrate that a ‘creative city’ is a CAS. The focus here is on the agents and their interdependence and interconnection with the context. Finally, the paper proposes the need to rethink the creative city and its development from the perspective of the agents interacting within the CAS.

2. Definitions and Limits of the ‘Creative City’

2.1 What is the ‘Creative City’?

Part of the confusion that surrounds the policy approach to the ‘creative city’ can be linked to the poor definition of the concept. The first coherent formulation of the ‘creative city’ concept is to be attributed to Bianchini and Landry (1995). Their work, taken further by Landry (2000), was linked to new repositioning of cultural industries and regeneration within UK urban development in the late 1980s and early 1990s. ‘Creativity’ is considered in its broadest sense, looking at how innovation can help cities to solve their everyday problems. The interactions between artists and the community are often cited as examples. The idea of culture as an engine to support a city’s image and economic development is also portrayed. This coincided with a new focus within the European Capital of Culture (ECC) initiative, specifically after the title was awarded to Glasgow in 1990.1

Until the end of the 1990s, the European academic concept of ‘creative city’ corresponded to the regenerative potential presented in the ECC vision. The focus was on an improvement of the city (with potential economic returns) through creative interventions and cultural activities. However, from 1998 onwards, the word ‘creative’ became popular in a variety of different contexts. This represents a shift towards the production of culture and creative products and the presence of skilled labour driving the new knowledge/creative economy. This shift is linked first to the emergence of the term ‘creative industries’ (DCMS, 1998) and secondly to the development of the ‘creative class’ theory (Florida, 2002b). The acceptance of the term ‘creative industries’ and the DCMS definition implied a new focus on the production of cultural/creative products, the creative workers and the infrastructure.
behind them. A new interpretation of the creative city emerges as a place where creative industries are concentrated and supported (Montgomery, 2005). Cultural consumption is considered as peripheral to actual cultural production, however.

The second, more recent and potentially more attractive, theory (Florida, 2002a, 2000b) suggests that the economic success of a city is determined by the presence of a ‘creative class’. The ‘creative class’ is defined as a range of creative professionals, of whom creative industries workers are only a small proportion. With this hypothesis, the ‘creative city’ can now be interpreted as the city with the highest actual presence of—or potential to attract—the creative class. Florida suggests that, to appeal to this group, cities should promote culture, cultural diversity and entertainment. Many Western cities have seen in Florida’s (2002b) theories a ready-to-use guide for local economical development. However, his theory has been criticised on different fronts

(1) From an economic perspective. In reference to the traditional measure of development, the correlations found in the research have not been shown to have a precise connection of causality with economic development (Malanga, 2004), especially after the ‘dot com’ boom (Kotkin, 2005).

(2) From a policy and political perspective. Florida has secured himself consultancy contracts to develop a “fast urban policy” for creative cities: “so packaged, creativity strategies were in a sense pre-constituted for this fast policy market” (Peck, 2005, p. 767).

(3) From a social perspective. Donald and Morrow (2003) highlight how many local policy-makers, including Florida, tend to mistake tolerance—an open-minded approach towards diversity—with the simple presence of cultural diversity. Furthermore, McCann (2007) underlines the strong links between the development of creative city-regions and rising inequalities, which also for Florida (2004) remains an open question.

Although all of these criticisms are interrelated, the present article aims to consider the limits of this approach specifically from a cultural policy perspective.

The limitation of the theory concerns its top-down perspective on developing assets for attraction and growth. It forces the idea that a ‘creative’ city needs specific local assets such as cultural amenities, café culture, cultural diversity, as well as a provision for high technology. It does not explain how the creative class interacts with these types of asset, or what competitive advantages they provide. Many policy actions suggested by the ‘creative class’ theory are geared towards building a façade that gives the creative class the impression of living in an attractive cosmopolitan city. However, the ‘creative class’ merges together professions which have very different approaches to life and culture (Markusen, 2006). It is hard to prove that the high-skilled knowledge workers of the new media sector are going to be interested in visiting an art gallery or taking part in an ethnic festival. “What is not being argued here is that there is an intrinsic value in ‘culture’ that attracts the ‘creatives’” (Pratt, 2008, p.108).

Many of Florida’s (2002a) indexes are based on the presence of specific assets (‘hard’ factors) and infrastructures—as well as a specific type of creative professions (bohemians): for his ‘cultural index’ and ‘coolness factor’ the cultural infrastructure, such as museums and galleries, is considered a proxy as well as the presence of nightlife and clubs.

The CT, which will be introduced in section 3, suggests that, while these play a role, the key to understanding the development
of creative cities is the interaction between the community and these assets and between different elements of this infrastructure. It is argued that a complexity perspective—which takes into consideration the importance of networks and non-linear interactions—needs to acquire a central role in the understanding of the creative city.

2.2 Contradictions and Limits of the Creative City Policy

The concept of the creative city has a variety of connotations and is linked to different perspectives on the role of cultural consumption and production. However, it can be argued that the adoption of the oversimplified ‘creative class’ theory has created a strong contradiction between the ‘creative city’ as a global discourse and its application in local urban development. As with many fuzzy concepts (Markusen, 2003) and branding exercises (Jensen, 2005), it can be seen as another globalised trend which has been accepted without critical debate. Some of the limits emerging in urban policy discourses can be understood in light of the following policies dilemmas.

Creative class versus creative industries/cultural workers. These two terms are often confused, but they refer to very different sets of ‘stakeholders’. It is wrongly believed that these groups want the same interventions and that interventions will cater homogeneously for both (Markusen, 2006). This is examined by Montgomery (2005) who points out that the creative cities listed by Florida (especially in Europe) often do not reflect the reality of the creative industries.

Local values versus global competitiveness in urban regeneration. This relates to the kind of assets that are promoted and audiences that are targeted. There is a contradiction in how policy interventions cater either for the ‘creative class’ or for the local population. Bailey et al. (2004) argue that this paradigm promotes a globalised culture that can cause a location to become anonymous. According to the authors, successful urban regeneration projects are those implying a strong involvement with the pre-existing community and local identity. Culturally based urban regeneration processes should not aim for the widest choice of cultural opportunities for the creative class. Instead, they should rediscover a sense of place, history and belonging. This is linked to a larger debate on who should be the target for cultural development in cities. While the local community can have a long-term interaction with the development, it may not have high-spending capacity. Visitors, with their short-term use of the city, may generate greater economic returns.

Short-term attraction versus long-term retention policies. There is a tendency to adopt a short-term perspective and to underestimate the need for balance between the attraction of ‘foreign’ talent and the development of local skills. Theoretically, there is no guarantee that investing in the attraction of ‘outside’ talents produces better long-term results than investing in the ‘empowerment’ and consolidation of local talent. On the contrary, if the focus is the attraction of a highly mobile creative class, cities would have to compete continuously for the retention of those highly skilled people with other fast-growing creative metropolises (Evans, 2009). As Gray argues

It assumes that every city can win in the battle for talent and growth. Creativity scripts, however, are better understood as ‘zero-sum’ urban strategies constituted within the context of uneven urban growth patterns (Gray, 2009, p. 19).

Conversely, some literature suggests that investing in ‘grassroots’ creative industries can prove to be more beneficial.
The development of a viable indigenous sector is crucial to providing a long-term basis for employment in the industry (Coe, 2000, p. 392).

These contradictions and dilemmas present in current policy are the result of a limited understanding of the complex interconnections which form the cultural development of the city. This has led to the wishful thinking that one policy can cater for all cities’ cultural development.

The hype is surrounded by strong pressure among policy-makers and cultural practitioners to find the perfect model of action ... there are no straight answers, or clear models to follow (García, 2004, p. 322).

However, in this fast-policy world, it is suggested that a careful reflection on the morals of the ‘creative city’ model are needed.

Until we have a serious debate concerning values and ethics, the creative city will remain a comfortable ‘feel-good’ concept for consultants, policy-makers and politicians rather than a serious agenda for radical change (Chatterton, 2000, p. 397).

The next section will introduce CT, its principles and its possible application in understanding the cultural development of cities. It will be argued that a complexity perspective can help us to reach a better understanding of the interactions and dynamics concerning these different dilemmas.

3. Complexity Thinking and the Creative City

3.1 Complexity Theory and its Principles

While this paper cannot present CT fully, it attempts to explore how it might provide a new key for a deeper and more articulated understanding of cultural dynamics in urban contexts. First, a brief outline of the theory is provided and its main principles are introduced.
**Table 1. Principles of CT and possible application in the cultural field**

<table>
<thead>
<tr>
<th>Principles of CT</th>
<th>Explanation</th>
<th>Possible applications/examples in the cultural development of cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex systems are ‘far from equilibrium’</td>
<td>The system is never fully stable as its structure, openness and connectivity imply continuous change</td>
<td>The cultural activities and organisation of cities are always changing influenced by policies, fashion, audiences and different communities taking part in the cultural life of the city</td>
</tr>
<tr>
<td>Interactions are non-linear</td>
<td>Feedback loops and self-reinforcing interactions mean that small events can have a large impact on the overall system</td>
<td>The decisions of small players, such as artists, to locate in a specific area of the city can be the catalyst which develops a whole cultural quarter</td>
</tr>
<tr>
<td>Complex systems are open</td>
<td>There is not a fixed boundary between the system and its environment; the system is often defined by the researcher for operational reasons, but this is always an approximation</td>
<td>The city’s cultural policies and activities interact with a series of other political, social and economic factors; the built and natural environment of the city can also affect the cultural development of cities</td>
</tr>
<tr>
<td>Distributed connectivity</td>
<td>The large number of agents interact dynamically; agents and relations take place at a variety of scales, with no centralised control over the system; this connectivity is often hybrid, involving human and non-human elements</td>
<td>Audiences interact with cultural providers, but also with the built environment, the cultural content and with each other; cultural planners need to interact with regional and national cultural agencies, funding schemes, planning and developers as well as with the audiences</td>
</tr>
<tr>
<td>Path-dependence and history</td>
<td>Complex systems can often display path-dependence: they have a history and this often contributes to their present behaviour</td>
<td>It is not possible to understand the cultural development of a city in a vacuum; the specificity of the context and its historical development contribute to the cultural profile, activities and individuals existing within the system; cultural planning needs to take into consideration this path-dependence</td>
</tr>
<tr>
<td>Adaptive behaviour and feedback</td>
<td>Individual agents are often unaware of the behaviour of other agents and the system as a whole; they simply respond to continuous interactions and provide feed-back allowing for co-evolution mechanisms and self-organisation to take place</td>
<td>Artists tend to interact with other artists and co-operate towards common goals; changes in funding structure or urban patterns, such as the emergence of an artists’ quarter, might influence their future decision on location or career choices; forms of self-organisation, such as co-operatives and shared studios, can emerge</td>
</tr>
</tbody>
</table>
Elements which might be marginal to cultural development, such as the local environment and its economic development, can have significant influences. Through CT, we accept that there are no deterministic patterns that can be followed; this is one of the main criticisms of the creative class theory. The value of CT lies in the possibility of understanding the micro dynamics of the system. This allows us to identify the emergence of structures and organisational forms that support and facilitate the connectivity and growth of the system.

Also the evolutionary nature of complex adaptive systems is key; they develop through trial and error.

Failures and successes are not primarily the signals of right or wrong policies but, rather, the by-product of a natural learning process (Lamboooy, 2002, p. 1033).

### 3.2 Complexity and the Creative Industries

There are different ways to read the development of cultural economies in cities as a CAS. To support this view, other contributions from the creative industries literature are acknowledged. They appear to integrate the complexity perspective at different levels: looking at interactions between creative industries within local clusters and, at the macro level, the interaction between creative products and their global markets. The paper argues that these perspectives need to be integrated into policy thinking at an urban development level. The limits of the current debate, specifically in cultural production and cultural consumption, need to be considered. When analysing the production systems of creative industries, the importance of patterns of cultural consumption in the city are overlooked.
Conversely, when cultural consumption (from the perspective of regeneration, image or participation) is studied, local cultural production is often ignored.5

Key contributions have underlined the role of local intermediaries in facilitating (micro level) interactions among local creative industries (Fleming, 2002), the importance of social dynamics in the interaction of creative industries (Kong, 2005) and the role of place in creating consensus among different agents (Julier, 2005). Significantly, literature relating to clusters and regional economic development suggests the importance of networks (Christopherson, 2002; Ettlinger, 2003; Grabher, 2002; Mossig, 2004; Neff, 2004) and their interconnection with the urban cultural infrastructure (for example, cultural quarters or cultural milieux).

Contributions have been weaker in identifying key structures and dynamics at the meso level (urban development and its cultural dynamics) but acknowledge the need for a better understanding between cultural consumption and production (Chapain and Comunian, 2009; Hall, 2000, 2004; Pratt, 2009).

At the macro level (markets dynamics in the creative economy), there has been a growing recognition of the specificities of the creative sector. In particular, there has been recognition of its social contagion dynamics (Kretschmer et al., 1999), the thin boundaries between the creative, knowledge and information sectors (Cunningham, 2004), its evolutionary dynamics and the role of social network markets (Potts, 2007; Potts et al., 2008), the role of consumer and meanings creation (Hartley, 2004) and the breaking down of barriers between producer and consumer (Uricchio, 2004).

As described by this literature, the nature of creative industries suggests a potential role for CT, without directly acknowledging or applying it. In fact, while creative industries are embedded in local networks (Banks et al., 2000; Coe, 2000) they also are part of a global cultural production system (Scott, 2004). The interactions between public and private in the sector imply a strong openness and inherent instability (O’Connor, 2002). This is accentuated by the bifurcated structure of the sector where a few multinational corporations co-exist with a myriad of micro enterprises, freelancers and sole traders (Jeffcutt and Pratt, 2002). All these features add to the complexity of the sector and its relations with the urban context.

The understanding of micro dynamics among creative industries and other agents at the local level is key to the understanding of the development of creative cities. This needs to be integrated into the wider creative economy and its global dynamics, although this paper will consider this only superficially, due to space constraints.

3.3 Methodological Implications and Limits

CT encourages a stronger focus on process rather than outcome. It explores the interaction among agents alongside the changes in the context. We must consider what the manifestations of these interactions are and how they can be captured by the researcher. This is one of the most challenging aspects of CT, as the interactions are hard to identify as many occurrences are at the micro level. Potentially, this long-term complex perspective should be embedded in most of the academic research; however, the ‘short-term’ policy (Jayne, 2005; Oakley, 2004, 2006) does not take into account this complexity perspective.

CT accepts a variety of research methods, from qualitative approaches to mathematical modelling and network analysis. The results from qualitative interviews and ethnographic materials from NewcastleGateshead are used to demonstrate that the cultural development of the city behaves as a CAS. The findings imply that agents are aware of the complex networks in the cultural economy of the city. The manifestations are very different across
diverse sectors of the creative industries as well as across public, private and not-for-profit sectors.

Green (1999) has questioned the application of CT to the social and economic dynamics of a city. He argued that, although we have snapshots of the complexity of a system and its behaviour, it is more difficult to address its evolutionary nature. This limitation could not be overcome within this research, as it would require a longer-term study. Using Green's (1999) framework, the last part of the paper seeks to question how the cultural economy of a city needs be studied as a CAS. The creative and the cultural aspects of the urban context do not just adapt to changes in the environment (such as a specific policy or investment), but they also influence and affect that specific context.

The results presented in the following section were gathered over two years of research carried out in Newcastle Gateshead and the North East region of England between 2004 and 2006. The project included 136 interviews and collection of social network analysis data with local creative/cultural professionals in the private, public and not-for-profit sectors.

4. Newcastle Gateshead as a Creative City: A Complexity Approach

4.1 The Context and its Development

The context of Newcastle Gateshead represents a challenging case study for research into the development of local creative and cultural economies. The growing attention towards this sector is part of a long-term regeneration commitment, although the area lost the European Capital of Culture prize in 2008 (Griffiths, 2006; Jones and Wilks-Heeg, 2004) and cannot therefore be compared with famous ECC case studies (Balsas, 2004; Herrero et al., 2006; Richards and Wilson, 2004). Nevertheless, for a variety of reasons, the city, and in particular the Quayside regeneration project by Gateshead city council, is considered a successful model of cultural regeneration (Bailey et al., 2004; S. Miles, 2005a; Minton, 2003). Some authors have presented reasons and supporting data for this success (Bailey et al., 2004; S. Miles, 2005a, 2005b), while others have considered the limits of the regeneration (Byrne, 2002; Byrne and Wharton, 2004). Our focus is not on the outcomes, but on the learning process and micro dynamics which characterise this case study.

The region’s focus on cultural investment began with the Year of Visual Arts in 1996. The ability of some regional actors (led by Northern Arts, now the Arts Council North East) to attract large public investment to the region is widely acknowledged (Bailey et al., 2004). This enabled the creation of large publicly funded cultural infrastructure such as The Baltic and The Sage Gateshead (Figure 1), together with other developments supported by the umbrella organisation Newcastle Gateshead Initiative (NGI).

The region, and specifically Newcastle Gateshead, had enjoyed a new image as a ‘creative city’, but local development was affected when the ECC award was lost. The question of how the local creative economy and public-sector infrastructure have benefited was reviewed; new reasons to keep the city’s commitment to its cultural investments needed to be found.

At the beginning of the 2000s, the Regional Development Agency (RDA), local authorities and support agencies started to look at the potential economic impact of the creative economy locally and regionally, with a strong commitment to the idea of ‘cultural quarters’ (Jayne, 2005). The NGI first formulated a ‘cultural quarters’ map of the city as a promotional tool. They identified five cultural quarters: the Quayside, Grainger Town, the Haymarket, Chinatown and Jesmond. This interpretation of ‘cultural quarter’ was based mainly on the consumption of culture, through the presence of large cultural...
institutions, shops and restaurants. In this classification, however, no mention was made of the Ouseburn Valley, the largest co-location of artists and creative practitioners in the area. Since 2002–03, the University of Newcastle has led a second ‘cultural quarter’ strategy. This major initiative also addressed the role of cultural production (specifically through the Culture Lab and the Northern Writers’ Centre). Other investments also reached the Ouseburn Valley, strengthening its role as the centre of the city’s cultural production. More recently, the RDA has commissioned more focused research on the ‘commercial creative industries sector’ (ONE North East, 2007), recognising that this could be a driver of local economic growth.

We use the material collected through interviews and ethnographic research to argue that the cultural and creative development of a city follows the principles of complexity and is therefore a CAS. The principles are explored under four headings: spaces of possibilities, far-from-equilibrium and innovation; non-linearity, feedback and co-evolution; connectivity, interdependence and self-organisation; and, emergent properties: clusters, networks and interconnections.

While arguing that these principles are actively governing all levels of the cultural development of our research context, we focus on two specifics: the creative practitioners’ individual career/work dynamics and the policy/decision-making level.

4.2 From Industrial City to Creative City: Spaces of Possibilities, Far-from-equilibrium and Innovation

The shift from the industrial to the post-industrial is a strong theme within the creative city and urban regeneration literature. However, little attention is given to the transitional phase between the old and new. It can be argued that there is not a single turning-point and that events evolve cumulatively. Interestingly, CT uses specific terminology to describe how complex systems experience change. If some elements within a system experience small changes, the system can be pushed ‘far-from-equilibrium’

Figure 1. The Gateshead Quayside. From the left: The Baltic, new centre for contemporary visual arts, The Sage Gateshead, music centre designed by Lord Norman Foster and the award-winning design of the Millennium Bridge linking Gateshead and Newcastle Quayside.
For a system to be innovative, creative, and changeable it must be driven far from equilibrium where it can make use of disorder, irregularity, and difference as essential elements in the process of change (Stacey, 1995, p. 490).

Often a single event, such as the ECC or a specific flagship investment, can be seen as the main catalyst for urban development. While this provides a simple understanding, there is no explanation of how change is organically embedded in the context. Significantly, the idea of 'space of possibilities' is found in complexity literature. Literature on 'creative cities' and 'urban regeneration' does not consider all of the possible outcomes in an evolving urban context. The majority of case studies describe positive examples and good practices; little consideration is given to alternative outcomes and the role of failure.

In the space of transition dynamics, the merging of Newcastle and Gateshead cultural policy must be considered. Before the joint bid for capital of culture, the two municipalities were rivals (S. Miles, 2005a); the cultural development policies adopted on both sides were initially self-interested. The 'vision' of Gateshead was towards large projects and cultural infrastructure, in contrast to the timid and sceptical approach of Newcastle.

The bid for ECC became the catalyst for 'NewcastleGateshead' to form (Matarasso, 2000). The possibilities created by this joint bid were much wider and further-reaching than the two municipalities could have achieved separately. Respondents identified that the risk-taking approach of Gateshead has had more effect than simply putting the region on the map. Initially, Gateshead led cultural development with the Angel of the North (2000), the Gateshead Millennium Bridge (2001), the Baltic Centre for Contemporary Art (2002) and the Sage Gateshead (2004). Newcastle followed with another wider range of cultural developments such as Dance City (2005), Seven Stories, the Centre for Children’s Books (2006) and the refurbishment of the Live Theatre (2007), Tyneside Cinema (2008) and others. This could be seen as emulation; however, it was the risk-taking approach of Gateshead that had upset the traditional balance between the two cities—where Newcastle was the headline-making city of the region. The reaction of Newcastle is both opportunistic and engaging as the new NewcastleGateshead brand is developed and the initiative established. Ultimately, there is also an element of contamination among the cultural infrastructure as people involved in Gateshead’s projects moved to new organisations in Newcastle. The linking of the two municipalities can be seen as a marriage of convenience for the ECC title; however, it can also be read as a new form of innovation and self-organisation which maximises the cultural offerings of both cities. It is an innovative model as none of the other UK cities had overcome its municipal boundaries as part of its bid.

The exploration of the ‘space of possibilities’ can be read at different levels. At the city level, it can be argued that different cities have seen, in the support of cultural economies, new solutions for their development and competitiveness. It is important to understand to what extent post-industrial decline and its social implications have shaped opportunities within cities. Elements such as a redundant workforce or disused buildings have left a vacuum for new organisations to fill. As this NewcastleGateshead policy-maker explains, when referring to the political will to bring about change in the city

The drive was very much from the public sector, particularly Gateshead Council, them to have the ambition and guts to say this is a region which has suffered for hundreds of years of decline, declining industry, mining, shipbuilding, high unemployment, not a lot going for itself, they have looked at alternative ways to reinvigorate the city (public-sector officer).
This exploration of new possibilities works not only at the city level, but also at the individual level:

I decided I did want to carry on being an artist ... I just realised that there was a very big gap in Newcastle for an artist-run gallery, a project that came from an artist point of view, so that became my focus ... it was quite strategic in terms of my own career as an artist because I felt quite invisible in the North East (visual artist).

Allen (1997, p. 6) talks about “a collective, spatial response to changing conditions”. We can recall that the growing importance of culture and cultural economies has been a response to the decline of the traditional industry. Even spatially, the old industrial warehouses have been the first spaces to be taken over by new creative practitioners (Zukin, 1982). This has occurred in NewcastleGateshead in the areas of Grainger Town, where derelict buildings have been converted into office space for media industries, and in the Ouseburn Valley, where artists have clustered around a disused warehouse (36 Lime Street; Figure 2). This ‘space of possibilities’ cannot be detached from the history the area. As a photographer suggests I think people underestimate the North East culture; I think it is very deeply rooted in various areas like the industry that used to be here, things like shipbuilding and mining and I think the lack of that now has left a bit of a void and some of the art works have helped to fill in that gap (photographer).

4.3 Non-linearity, Feedback and Co-evolution

In CT, interactions are not centrally regulated but depend on internal and external feedback. Its connectivity and adaption imply that making predictions of outcomes or trends can no
longer be taken for granted (Holland, 1995). This means that

behaviour patterns can emerge without being intended and in fact often emerge contrary to intention, producing unexpected and counter intuitive outcomes (Stacey, 1995, p. 480).

This is also experienced in the cultural development of cities. For example, at the policy level, there is often an assumption that public policy and investment act in a direct causal way. Conversely, cultural agents, creative industries and agencies of the city identify non-linear interactions influenced by adaptation and feedback. Even large investments, such as the establishment of a new art gallery, normally seen as having a positive local impact, do not necessarily provide a connection with local artists or inspire local creative industries. This has been seen with the Baltic art gallery in Gateshead

I think Baltic is kind of this great resource that we’ve got, but it’s not functioning regionally; artists aren’t trying a connection with Baltic, and Baltic’s not really helping artists in the region (commercial art gallery).

However, because of the Baltic’s outreach and participation programmes, it has helped to build an audience for arts events and to expand the art market—thus, ultimately, affecting local artists positively. As CT suggests, microscopic interactions can result in new and different possible outcomes at a higher level. A possible non-linear effect of the Baltic’s activities can be seen with the ‘Own Art’ scheme. Via this scheme, the North East region accounted for 23 per cent of national contemporary art sales, despite having only 4.2 per cent of the population. It is impossible to attribute this fact to one single element or incident, but as the influence of many elements and their interaction.

The same, non-linear effects can be seen in the growth of the creative industries sector in the region. This growth could be an effect of local cultural investment; however, the attraction of talents and international companies, must be considered within the region’s supportive environment and its grassroots cultural development. The non-linearity of the regeneration process has been described elsewhere

These developments were underpinned not by economic imperatives, but by a will and determination on the part of local arts activists and politicians to provide the area with the cultural facilities that it deserved. It may well be the case that the cultural imperative is the crucial ingredient here (Bailey et al., 2004, p. 61).

The possibility of developing creative economies without direct investment, but through indirect support from the market, through advocacy and participation, is supported by a designer

From the public sector perspective, I think that’s where they should be putting the main effort in educating people, helping people understand, highlighting, showcasing and that would do more for the design business than any grant that they give out, grants just increase the number of businesses, while this would increase the number of contracts available and the industry would expand consequently (designer).

Part of the public development strategy for the cultural infrastructure of NewcastleGateshead has been in the long-term, embedded approach to participation and access. This policy encourages the need for the agents of the system to co-evolve within a changing environment. The evolution of one domain or entity is partially dependent on the evolution of other related domains or entities (Kauffman, 1993). It is not just simple adaptation; it is an evolution which changes both the agents and the environment. This is illustrated by a gallery owner
In places like The Sage Gateshead, people are making hard business decisions, obviously thinking that it is worth investing in it. They would not be doing it if there was not a market; it is fantastic for the city and the knock-on effect is that you get smaller groups following, it is a sort of piggyback effect and hopefully it is gathering momentum (commercial art gallery).

Co-evolution is suggested by the long-term implementation of the cultural investments which started in the early 1990s, culminating in 2004 with the opening of the Sage Gateshead. This is also seen in ‘Culture 10’, a 10-year support programme of festivals and events running until 2010.

In 2001, NGI led the bid for the European Capital of culture, the announcement came in 2003 and we were the bookies’ favourite to win and everybody was very shocked when that did not happen, but the partners ... decided that the bidding process and the momentum developed and the profile gained was too important to lose, so they created the events team at Culture10 (public policy officer).

**4.4 Connectivity, Interdependence and Self-organisation**

A CAS is characterised by interaction and interconnectivity of the system’s agents and its environment, generating the complexity within the system. If one looks at the culture offerings of a city, it is easy to see how different organisations build partnerships and collaborate on events and projects. The private and public sectors often come together and the connectivity in the arena arises from the overlapping and exchange between different art forms.

One key factor for the development of this connectivity in the context of Newcastle-Gateshead has been the joint bid for the ECC title. Matarasso (2000) stresses the importance of the bidding process itself: it encouraged the networking of cultural institutions, created partnerships and common goals and provided a strong experience in terms of acquiring competences for cultural planning and management which is long-lasting legacy in the urban context. This is clearly described in the approach of the director of this organisation

In the first 18 months, we worked in shared public projects with almost every cultural organisation in the city; it was a very deliberate policy; we also opened the building to creative people, young people in the region, people who had no real access to other venues (director, public cultural organisation).

The importance of connectivity is present at the institutional level, as the director of one of the major Quayside arts institutions explains

I am part of this supper-club which is called NewcastleGateshead Arts Forum which meets regularly for dinner; basically it is the big institutions of the city Sage, Baltic, Live Theatre, Northern Stage and others, and we talk over projects and what is going on (director, public cultural organisation).

The connectivity and interdependence operate not only at the macro level of agencies and institutions, but also at the micro level in the creation of networks between creative and cultural practitioners. Peer-to-peer interconnections, through formal and informal networks, form a means to create the personal support infrastructure that a creative practitioner needs. As suggested

The most important thing is mixing with other people; you can make do without all the services provided and business advice, but the most valuable information comes from other people doing the same things as you ... [they] can remember how it is like to be in your position, but they worked through those problems and they can advise you (jewellery designer and maker).

Interdependency is also essential in the cultural and creative economy, as often
the cultural product is the result of collaboration across a variety of sectors and skills and from private and public funding. Practitioners recognise their dependence on public investment, exposing the reality of an often money-dependent rather than money-making creative economy.

We have a very strong Arts Council and a lot of the work that they do is fabulous they are very supportive, but we also have a very strong grant culture in the North East. I could not name you 10 artists whose practice has not been dependent in the past on grants either from the Arts Council or Newcastle City Council (visual artist).

Responding to emergent properties, particular innovative and enabling contexts, a complex cultural system can experience self-organisation, seen particularly with cultural and creative practitioners. This is seen through artists’ collectives, voluntarily run spaces and galleries, but also through networks which are developed from the grassroots by artists, as clarified in the next sub-section.

4.5 Emergent Properties: Clusters, Networks and Interconnections

One of the complexity aspects which also characterises the creative and cultural infrastructure of the city, is the emergence of specific structures that regulate and inform the environment. These can be identified with creative clusters (Pratt, 2004) and in the development of organic and institutional networks to support and govern the cultural actors and agencies.

The fast growth of the sector as a whole can be seen as an emergence pattern.

The North East (creative economy) has grown faster than any other region except Scotland, but from a lower base than any other region (CURDS, 2001, p. 23).

As Allen (1997) suggests, these emerging structures are not determined uniquely by the context and its parameters, but by timing and specific external interventions.

In an economic context, networks are primarily important in terms of interfirm trade, while the creative industries also rely on networks for other aspects. The creative and cultural industries’ networks provide access to the market, but also support the exchange of ideas and social interaction that are vital for the development of their work. Artists and craft workers rely on the network for market building and as a marketing strategy. One example, in the context of the North East, is ‘Designed and Made’, which was established among designers and makers with the vision of establishing a brand and as a way to promote their work.

I think it is really important for the North East to show that this kind of work exists in the region, that there is work here which is pushing the boundaries, and unless you have something like ‘Designed and Made’, other regions, and the rest of the UK and the world, won’t know about the North East and what is going on here (designer and maker).

Another example is ‘Network Artists’. Artists use the network to promote their work and through the open studios ‘Art Tour’ project and so have direct access to the market. ‘Cohesion’, the glass artists’ network started by the local authority of Sunderland, has a specific focus on developing the market for glass art, specifically investing in exhibitions and promoting artists.

Networks are emergent structures that provide support for creative practitioners, even if this may be only moral and psychological, in response to the isolated work dynamic of the artists, as suggested by a jewellery maker.

I found it quite a life-line because it got me involved with the artistic community and it made me feel part of something ... I think it is really important because as an artist/designer people work on their own and feeling quite isolated, it makes you feel there is other people...
out there that you can share experiences with, you get ideas bouncing ideas to people, it just helps (designer and maker).

Creative industries tend to rely on different types of network. Specific formal organisations form one level of networks; they also link to their peers with whom they would talk with more often. It seems that sometimes formal networks are considered useful but impersonal and too structured; they are more like professional development organisations than actual networks. As Kauffman suggests in reference to biological systems

Ecosystems are not totally connected. Typically each species interacts with a subset of the total numbers of other species; hence the system has some extended web structure (Kauffman 1993, p. 255).

There is a social element within the networks, a bond and shared experience that holds people together. It is often the case that, within large formal networks, people form smaller and closer social networks

Connectivity between individuals or groups is not a constant or uniform relationship, but varies over time, and with the diversity, density, intensity and quality of interactions between human agents (Mitleton-Kelly, 2003, p. 6).

As an artist who started a network in the Newcastle area suggested

I thought the network would grow and become more established, but it remained quite organic and it is made by how much people want to interact with it. It is very organic in this sense because, as a living organism, sometime it is very active and lots of things go on, some other times it is more quiet and slow but this is how it should be because it follows the will of people to interact with it (visual artists network manager).

Furthermore, as an artist suggests, organic networks respond more directly to the needs of the people involved

Yes it is very important, because it is artist-led; we are making it what we need, we know what we need and we are making it that, coming from us it is going to be more relevant than if it was coming from people in the public sector, who have the best intentions but they do not work in the sector and they do not exactly know what we need (Glass artist).

The social dimension and the trust which can be built (Banks et al., 2000) are perceived to be very important for the person and their work. Therefore, networking often takes place informally and as part of normal social interactions, these are

‘Structures of feeling’ which are very difficult to grasp, let alone strategically direct, but which nonetheless are crucial to the urban regional ‘innovative milieu’ (O’Connor, 2002 p. 27).

These are described as contrasting with formally planned professional networks

It was a voluntary organisation, it was founded by two writers and had come from grassroots level; we used to have a meeting once a month, we would have a speaker in and then go down to the pub, it was fantastic, then when Northern Arts decided to have a new full-time officer, a professional came in ... it seems to me that everything now is so much more formal rather than informal, that kind of social network disappeared (freelance scriptwriter).

5. Conclusions

The paper has used the case study of NewcastleGateshead to demonstrate that the cultural development of a city is a CAS and follows the principles of complexity. What are the implications of these findings? How can complexity theory help us to rethink the structures and potential of the concept of the creative city? What difference can this rethinking of the creative city concept make? The paper argues that it can make a difference at the research level (and the way the research aims to collect
and interpret data), but it also needs to make a difference in the way policy-makers address the cultural development of cities.

Two important conclusions may be noted. First, is the lesson learnt from NewcastleGateshead and the implications for policy-makers—specifically in reference to the policy contradictions identified earlier on in the paper. Secondly, there are wider implications for the research agenda and how this has moved forward our understanding of the creative city—specifically with reference to the ‘creative class’ theory.

5.1 Policy Implications: Lessons from NewcastleGateshead

First, the use of a CT approach to the study and understanding of the cultural and creative economy of NewcastleGateshead has identified how changes take place in an urban context. While providing a snapshot of the complex system that surrounds the cultural development of a city, it is not exhaustive. However, new findings from the same or connected contexts can be integrated to provide a better understanding of how the system is changing. Unlike other more targeted methodologies, this approach suggests the need to take into consideration a variety of agents across different levels of interactions. Viewing the case of NewcastleGateshead through CT allows us to see important interactive dynamics, but it does not allow us to develop a recipe for success for other cities. Nevertheless, cultural policy tends to remain instrumentalist despite the insights of complexity theory that outcomes of a given intervention cannot be predicted in the way assumed in the rational planning model (M. Miles, 2005, p. 894).

As Allen (1997) suggests—from a CT perspective—the concept of what policy can or should do needs to be completely revisited. The focus on the interaction and interdependency of different agents in the context offered by CT is the key to solving the identified policy contradictions. The opposition between creative class and creative industries needs to be articulated further and, while certain policies might influence both, others will need to address the separate needs of the two groups. Investments towards one of these would not necessarily facilitate or promote the other group, but might present a long-term impact on the system. The attention towards local assets and dynamics becomes the key to unlocking global markets. In particular, in the case of NewcastleGateshead, the local ‘creative’ workforce and grassroots community become the leverage to acquire a national and international profile. As shown by M. Miles (2005), the sense of local pride becomes the key to successful regeneration in NewcastleGateshead. A long-term vision can be adopted alongside short-term policies as the system interacts at different levels. For example, while the bid for ECC was a short-term goal for the city, it resulted in the establishment of a 10-year programme of events (NGI). Possibly this ‘model’ can never be replicated: it implied access to large capital investments, which are simply no longer available; it required a very bold approach from specific agents with strong political consent, again not replicable in other UK contexts. It also required a context for which local agents feel a strong attachment and affection, despite its decline (Taylor and Townsend, 1976).

Interestingly, if we apply the creative class theory, these local agents should have been attracted to more ‘creative’ places when NewcastleGateshead was in decline, making its development impossible. Attracting the creative class can be seen as one of the possible strategies for the development of the creative city. Understanding the instability of the system requires a long-term view that integrates attraction with support for ‘local’ talent—specifically through social inclusion and participation—as exemplarily adopted by Gateshead. As Landry recognises...
Successful cities seem to have some things in common—visionary individuals, creative organisations and a political culture sharing clarity of purpose. They seemed to follow a determined, not a deterministic path (Landry, 2000, p. 3).

5.2 Moving the Research Agenda through Complexity

This paper has attempted to use CT to highlight some of the dynamics in the creative economy against a tendency towards reductionism. The arguments presented suggest that we should consider the creative and cultural factor as grounded in the urban context, rather than as an additive to urban discourses on economic growth. Also, Ormerod argues the need for a less mechanistic approach to the study of economic phenomena.

Economies and societies are not machines. They are more like living organisms. Individuals do not act in isolation, but affect each other in complex ways (Ormerod, 1998, p. x).

This proves to be in contrast with the deterministic approach implicit in Florida’s work. While, the data he presents can help us to estimate the presence of certain kinds of creative occupations in different cities, they provide very limited explanation about the interaction of these creative workers with each other and their contexts. The ‘creative class’ theory, although highly regarded by policy-makers, does not give an account of the dynamics of the creative industries, as they are merged in a wider industrial base. This further weakens the possibility of understanding in which ways the agents of the creative economy interact within the urban environment.

When developing indexes for culture, it is not the simple presence of the asset that must be counted, but also how many citizens (and tourists) utilise it, the types of participation/outreach programme developed and how artists and other organisations are involved in it. It is these intangible elements that provide a more realistic measure of the success of the cultural infrastructure and how it can possibly impact on a city at large.

There are no fast-track solutions in the development of creative cities. While cities can act in certain ways, such as building a new art museum, the connections between that infrastructure and the local community and local creative practitioners cannot be taken for granted, but are constructed by daily interactions and feedback.

A new understanding of the dynamics of the creative economy and the interactions across different sectors of the creative industries needs to be implemented. This approach must bridge the gap between the top–down investments in the cultural infrastructure of a city, with a grounded understanding of the emergent structures arising from actors and agencies working in the sector.

CT is not immune from limitations; understanding the cultural development of a city as a CAS presents its own difficulties and challenges. In particular, the distributed understanding of interactions among agents challenges the researcher as to what methods and data can best explain and represent multilevel interactions. Simply defining the boundaries and components of the CAS can be problematic; what kind of agents can safely be excluded from an analysis, when all agents are, to an extent, contributing to defining that cultural landscape. While data analysis and representation can improve over time, especially with new visualisation methods, another challenge remains in the interpretation of data, specifically regarding human systems. Part of the problem lies in the distributed responsibility and evolution which characterise a complex system. Another difficulty lies in capturing change over time. As Green (2001) underlines, the challenge of applying CT to social systems is the fact that change is an intrinsic system function—where even small changes at the grassroots level affect how the system is, and how it will subsequently change.
This should be the new challenge for researchers wanting to investigate the role of culture in urban environments.

Notes

1. Glasgow is the first city to be given the title that had not been a culturally recognised leading European city, such as Florence and Paris. The choice of Glasgow was motivated specifically by the potential to improve its image and regenerate the city.

2. In Florida's own words, at the core of the creative class there are people in science and engineering, architecture and design, education, arts, music and entertainment, whose economic function is to create new ideas, new technology, and/or new creative content, [but also] the creative professionals in business and finance, law, healthcare and related fields (Florida, 2002b, p. 8).

3. This is articulated further in the three Ts indexes: technology, talent and tolerance are the proxy by which the ability of a city to attract the creative class can be measured and implemented.

4. For example, Montgomery (2005) suggests that Leicester becomes the second-most-creative city in the UK, just because too much weight is put on the fact that it has a large non-White population, even if its creative economy is not developed more than other UK cities.

5. I acknowledge the suggestion of one of the referees concerning the necessity to point out this limit of the current debate.

6. Although it would be interesting to explore these differences among creative industry sectors, the paper will not do this due to space limitations.

7. Newsweek Atlantic edition, on 2 September 2002, wrote that “NewcastleGateshead listed as one of the world’s eight most creative cities”.


9. Other levels could be identified—for example, the geographical scale, how interactions are governed in different areas of the city (regenerated areas, cultural quarter versus other areas) or the artists’ networks and pressure groups and how they interact with policy.

10. ‘Own Art’ is a loan scheme developed in the UK by the Arts Council. It allows a 0 per cent loan for buyers of contemporary art in different commercial galleries associated with the scheme. Almost a quarter of all loans (23 per cent) taken in the first 18 months (April 2004–September 2005) were made by galleries in the North East region, with the highest percentage of sales achieved in any region (Arts Council of England, 2006).

11. This approach, which is typical of the large American cities studied by Florida, is probably not part of a European perspective of the creative economy if we exclude a few European capital cities.

12. Leeds had the possibility of taking the risk of a major art work of the size of the Angel of the North (proposed by the same artist Antony Gormley) before Gateshead, but did not risk the controversy attached to such an investment (Sandle, 2000).

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