Oriental and occidental approaches to complex tourism systems

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Abstract

The paper examines the methodological approach to the study of complex tourism systems and how they evolved. In particular, the need for a systemic holistic view is called for, and is considered more suitable than traditional reductionist approaches in providing meaningful insights. In examining complexity theories, a parallel with oriental philosophies and world views is made. It is argued that in a new globalized epoch, cross-fertilization of Eastern and Western thinking styles can promote further development of systems disciplines and be highly beneficial for the understanding of the structural and dynamical characteristics of tourism systems.

Introduction

Global tourism has undergone a period of significant change. One of the most visible is the increase in the international mobility of Asian people, especially from China and India. Since the millennium, for example, Chinese outbound tourism has more than doubled reaching about 80 million trips in 2012, with more than 30 per cent having Europe or the Americas as destinations (Thraenhart *et al.*, 2012). The same can be said about India, which generated some 15 million outbound trips in 2011 with similar destination preferences (see www.indiastat.com).

This phenomenon has revived interest in exploring and understanding the different cultural settings these travellers and their societies have. Mostly driven by obvious considerations such as offering appropriate and conducive products and services (Arlt, 2006; Li, 2008; Li *et al.*, 2011; Reisinger, 2008), this revival has also had some interesting side effects in the interaction that different cultural traditions can have on the study of tourism and of the systems that compose it, at least as a different philosophical and epistemological approach (Krippendorff, 1979; Needham, 1954).

The main ain of this contribution is to discuss these different approaches and their effects on tourism studies, and, in particular, to examine possible methodological alternatives to the main-stream methods used so far. To do that, next section will briefly review the generally accepted stance in the study of a phenomenon, identifiable as classical scientific method. Starting from the issues and the difficulties arising when dealing with complex matters such as economic, social or physical systems, the following section suggests a more comprehensive view, known today as complexity science. The similarity of these approaches with what could be loosely defined as

eastern philosophies will facilitate recognition of the value of widening perspectives by considering how different cultures face the understanding of systems and phenomena.
The focus of this discussion is on methodological and epistemological approaches as a way to overcome an excessive specialism, which is considered by many to be detrimental for the advancement of basic knowledge (Geymonat, 1972). This, in a field such as tourism, influenced by so many different disciplines, can hinder even more the process towards the establishment of sound theoretical foundations.

The occidental approach to research

Since the mid-20th century, tourism has become one of the main economic sectors in the world. Its contribution to development and poverty alleviation is significant and for many countries it represents the major, if not the only, source of prosperity and growth for the economy and society.
During this period, the phenomenon has been studied so as to better understand the structural characteristics of the different systems and subsystems that have developed, and to examine their dynamic behaviour with the objective of formulating predictions for future performance and outcomes.
Whilst many approaches have been taken towards tourism studies, scholars and practitioners generally recognize the value of interdisciplinarity, multidisciplinarity, and crossdisciplinarity.
Actually, it has been long debated whether tourism can be considered a discipline or not. And it is still debated whether, instead, the study of the phenomenon should be scattered across a number of different fields, and the efforts of geographers, sociologists, economists, mathematicians, ecologists and historians, should be better redirected by considering tourism as an applied exercise of their home disciplines (Echtner and Jamal, 1997; Farrell and Twining-Ward, 2004; Faulkner and Russell, 1997; Leiper, 2000; Przeclawski, 1993; Tribe, 1997). Gunn and Var, for example, go as far as to state that (2002: 4):

> ... tourism itself is an abstraction. It doesn't exist, at least not in the same sense as a residence. Tourism is not even a discipline, such as chemistry or geography. Tourism is a field made up of many physical, program, and action parts. It is only the pieces of tourism and their aggregation that can be planned. Tourism is not under the control of one owner, it has no CEO. It is controlled by a multitude of owners, …

Millions of human beings move every year from their homes and foster this *non-existent abstraction* with their expenditures, inducing the generation of millions of jobs worldwide and contributing significantly to the economic and social conditions of many countries. As a result, the importance of this phenomenon induces a wealth of studies, investigations and surveys on many different aspects. However, as Farrell and Twining-Ward note (2004: 276):

> It is frequently acknowledged that tourism study is lacking in substantial theory of its own […] and has failed to capitalize on progress made in other disciplines. Consequently, as a field of study it appears isolated and research and teaching appear to have grave shortcomings attributable to its multidisciplinary history, organization, and relations with other fields that should inform the study.

In any case, the efforts directed towards the establishment of sounder and more rigorous methodological approaches to tourism research continue with the objective to assemble a reasonable set of paradigms (in the Kuhnian sense) that may raise the status of this area of study to an accepted scientific discipline. This is not an easy task and has to confront the fact, well described by Franklin

and Crang (2001) that, up to now, tourism studies have produced a wealth of investigations, case studies, surveys but seem to have given up on a deeper reflection on the possible theoretical foundations of the matter. Probably, as Franklin and Crang argue, the reason may be traced to the excessive dominance exercised by policy-led and industry sponsored works that strongly
push towards a restricted focus on their priorities and perspectives. This has become a widely spread attitude in the tourism research environment. As an example, on many occasions, reviewers will accept a paper for publication only after the author has discussed the implications of the work for the industry or the practitioner even when the work has no aims in this regards.

Western civilization has set up and refined, in the course of its history, a more or less standard way for scientifically studying a phenomenon, tackling an issue or solving problem. This standard way, however, is modified in many cases by individual convictions and viewpoints that, even if seldom defined fully or coherently, may have wide effects. In fact, personal philosophical and epistemological beliefs have always played a crucial role in the history of science, and in many cases have deeply influenced the development of ideas and knowledge.

The general approach consists of a series of steps: examine the object of study, decide whether our knowledge and techniques are sufficient to address it, explore what and how others have produced in similar circumstances, collect some empirical evidence, derive the appropriate conclusions and, finally, sketch some action that should lead to meet the aims of the work conducted. In doing that, researchers use a vast array of specific techniques, epistemological positions and philosophical belief (Losee, 2001). In this multifaceted scenario, however, one element seems to be well grounded and accepted by the great majority. When facing a big problem, a large system or a complicated phenomenon, the best method is to split it into smaller parts that can be managed more easily. Once obtained the partial results, we can recompose them to find the general solution. This notion is known as reductionism (here the term is used without that somewhat negative connotation that it has in social sciences where it is sometimes interpreted as over-simplistic approach). It can be summarized with the words of the man who formalized the idea: René Descartes. In the Discourse on Method (1637: part II) he states that it is necessary “to divide each of the difficulties under examination into as many parts as possible, and as might be necessary for its adequate solution”, and in the *Regulae ad directionem ingenii* (rules for the direction of the mind), he says quite clearly (1701: rule V):

> Method consists entirely in the order and disposition of the objects towards which our mental vision must be directed if we would find out any truth. We shall comply with it exactly if we reduce involved and obscure propositions step by step to those that are simpler, and then starting with the intuitive apprehension of all those that are absolutely simple, attempt to ascend to the knowledge of all others by precisely similar steps.

and (1701: rule XIII):

> If we are to understand a problem perfectly, we must free it from any superfluous conceptions, reduce it to its simplest terms, and by process of enumeration, split it up into its smallest possible parts.

Reductionism is rooted into ideas that evolved from the pre-Socratic attempts to find the universal principles that would explain nature and the quest for the ultimate constituents of matter. The whole western tradition then elaborated on these concepts that were admirably distilled by in the 16th and 17th century. Copernicus, Galileo, Descartes, Bacon, Kepler came to a rigorous formulation of the methodology needed to give an accurate meaning to *science*. This work was refined very fruitfully by Isaac Newton in his *Philosophiae Naturalis Principia Mathematica* (1687). The book was so

successful and so widely distributed that scholars of any discipline started to apply the same ideas to their own field of enquiry, especially in those areas that did not have a strong empirical tradition such as the study of human societies and activities.
The reasons for the wide influence were the simplicity, coherence and apparent completeness of the Newtonian proposal coupled with its agreement with intuition and common-sense. In the following years many scholars such as Thomas Hobbes, David Hume, Adolphe Quetelet, Auguste Comte (to cite only a few), worked with the objective explaining aggregate human behaviour by using analogies from the world of physics, and employing its laws. And Vilfredo Pareto or Adam Smith adopted the mechanical paradigm to the field of economics. The possibility of rational mathematical description for all natural phenomena, however, was challenged quite soon, and the work of scholars such as Poincaré (1883) or Lyapunov (1892) provided evidence of the fact that, in some cases, even minor changes in initial conditions of relatively simple systems, described by deterministic relationships, would result in widely differing evolutions. This dynamical instability or sensitivity to initial conditions, that today we identify with chaos.
The need to cope with systems composed of many elements brought 19th century scientists to a quite different approach. Instead of a purely mechanical and analytical technique, statistics was employed for the formulation of a new set of instruments enclosed into a rigorous theoretical framework, known today as statistical physics. Equipped with this toolset it was then possible to study a system's dependency on external conditions or boundary conditions, the effects of variations in some control parameters, the transitions between different phases or the existence of critical conditions.
One important consequence of this theoretical framework is that it is possible to identify universal properties that are independent of the specific form of the individual systems' constituents. This generates the idea that the structural features of a system have a crucial role in determining its functionality and its dynamic behaviour. Moreover, it suggests the hypothesis that universal laws or results may show up in other types of complex systems, whether they be social, economic or biological. The concept of universality in statistical physics has the basic objective of capturing the essence of different systems and classifying them into distinct classes.
In addition to that, when studying critical phenomena, or critical conditions in the system's evolution, a set of relations, called scaling laws, may be determined to help in relating the various critical-point features characterizing the singular behaviour of some system parameters. Both hypotheses are supported by a wide range of experimental work, and also by numerous numerical simulations (Kadanoff, 1990; Stanley, 1999).

Widening the perspective: a systemic view

As seen, the Newtonian classical approach was, in many ways, extremely successful for scientists and problem solvers, but showed a strong limitation when taken to extremes or applied to unsuitable issues such as complex systems composed of many interconnected elements. Simplification leads to outcomes that often misrepresent the object of study and do not allow a full explanation of the phenomena tending to disregard the complex network of relationships existing and their effects. A possible solution is to widen the perspective and consider the problem under study as a single entity.
A systemic view is centred on the concept of system, seen as a configuration of elements joined together by a web of relationships and sensible to external forces that may modify its structure or behaviour. In this approach we abandon the traditional idea of cause and effect, which is directly

connected with that of predictability, and use statistical methods for creating possible evolutionary scenarios and assign them a probability to happen. This is, in essence, the idea of complex adaptive systems.

Complex adaptive systems

Complexity science studies the behaviour of large collections of simple interacting units and their capacity to evolve with time. In many cases, when the relationships that bind these units are nonlinear and dissipative, complex phenomena show up from their collective dynamic behaviour. Non-equilibrium structural reorganizations (of a spatial, temporal or spatio-temporal nature) spontaneously appear on a macroscopic level creating new emergent properties. This is referred to as self-organization, the most important visible characteristic of a complex system (Coveney, 2003). Rigorously, complex systems are difficult to define and there is little consensus on what a complex system is. However, scholars and practitioners in the field have a relatively clear idea of what symptoms characterize them. The most relevant of these are (Bar-Yam, 1997; Levin, 2003; Waldrop, 1992):

- a large number of elements and connections;
- uncertain boundaries: complex systems are often open systems and their boundaries are not well defined;
- memory: in its dynamical evolution prior internal states may influence present states in different ways and with different strengths;
- non-linear relationships between the components: this originates the fact that small perturbations (internal or external) may cause effects of diverse sizes, even catastrophic. Moreover, relationships contain feedback loops that may alter single elements or the whole system by stabilizing (negative feedback) or amplifying (positive feedback) the behavior;
- emergent phenomena: complex systems usually exhibit emergent behaviours. In other words, while results of a dynamical process may be deterministic when analysed at a certain scale, they may have properties that can only be studied a higher levels, and cannot be easily predicted by composing individuals' characteristics or behaviours;
- internal structures: they are created by self-organizing dynamics and may exhibit different topologies at small and large scale. These structures may be nested and be complex as well thus originating complex hierarchical organizations;
- self-similarity: a complex system looks like itself when observed on different scales (if magnified or made smaller in a suitable way). This is evidence of a possible internal complex dynamics of the system.

In its evolution a system can experience a number of different states (configurations), normally identified by the values of some parameter (order parameter) that characterizes system's behaviour. It is possible for a system to pass from a completely ordered phase to one in which its behaviour is so heavily dependent on small variations of the initial conditions that, although deterministically shaped, they appear completely unpredictable: a chaotic phase (Figure 1).

The region at the boundary of these phases, known as the *edge of chaos*, is a region of complexity (Crutchfield and Young, 1990; Waldrop, 1992).

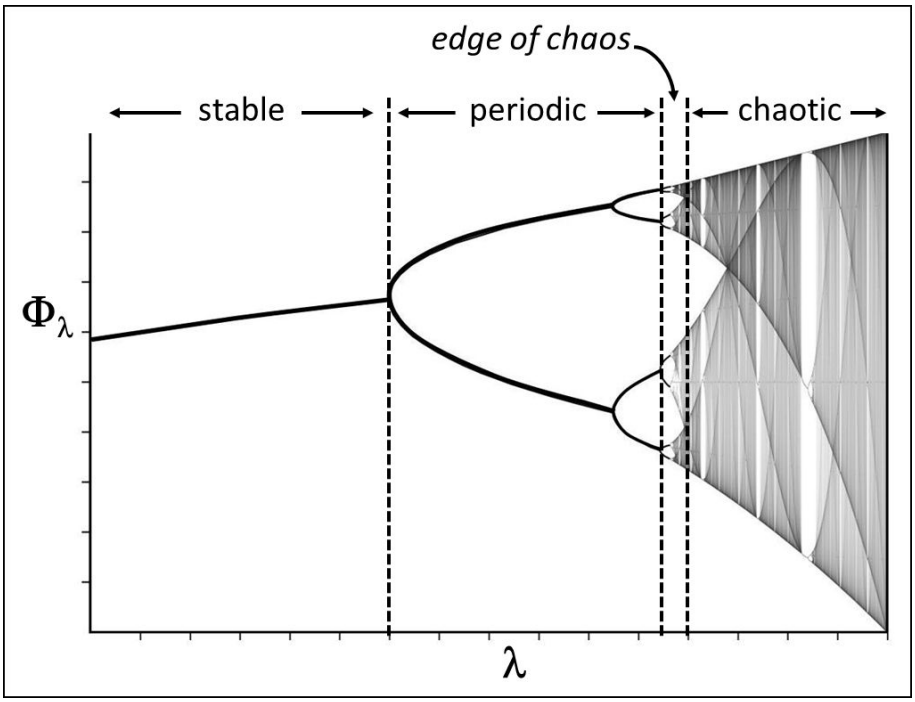

Figure 1 A schematic representation of the evolution of a system (Φ_λ) dependent on a control parameter (λ). By changing λ the system goes though different phases: stable, periodic (multi-stable), chaotic. The edge of chaos region is a configuration of adaptive complexity.

Chaos theory essentially studies non-linear effects in deterministic systems, while complexity theory studies definite patterns in non-deterministic systems (Kauffman, 1995).

Tourism, as an economic activity, shares many of these attributes. A tourism destination includes many different companies and organizations connected by diverse relationships that are often non-linear. The response of the various stakeholders to inputs that may come from the external environment or from what happens inside the destination may be unpredictable as the outcomes of their behaviour (Haugland *et al.*, 2011). Nonetheless, as a whole, the system seems to follow some general laws.

In tourism, the approach derived from the Newtonian paradigm has tempted some scholars to hunt for universal laws that could explain the dynamic behaviour of the systems under study. An example is the model by Butler (1980). Although widely discussed, it is considered by many to be able to give a meaningful description of a tourism destination and has provided, at times, some insights for managing destinations' structures and developments (Butler, 2005a, 2005b). However, it must be noted here, that the excessive simplifications needed to formulate this model make it a little trivial and not really able to capture all the different possibilities and the rich interactions that such systems exhibit. As a consequence, many real behaviours and outcomes can be hardly represented, unless in cases where the evolution is relatively linear and stable over the observational timeframe and no major disruptions occur, whether internal or external to the system.

Several tools and methods have been developed for analysing complex systems. Given the features described above, many of these tools use numerical simulations since in the large majority of cases, analytic treatments are impossible.

The use of these methods could be questioned in some areas, such as those belonging to social or economic sciences, where the object of study are, essentially, people or their groupings. Yet, it must

be considered that in investigating a socio-economic system we are mainly interested in its global dynamics and in the possibility of making predictions at this level rather than speculating on the behaviour of each single component (individual actors). The primary objective is to understand how regularities may emerge (if and when they do) out of apparently erratic actions of single individuals (Castellano *et al.*, 2009; Majorana, 1942). Therefore, as it happens when using traditional statistical methods, we can disregard single individuals and concentrate on the aggregate properties of the whole ensemble.

The application of the complexity framework to the study of tourism systems is still scarcely employed, but the cases in which it has been used have provided interesting outcomes form a theoretical and a practical point of view (Baggio, 2008; Baggio and Sainaghi, 2011; Baggio *et al.*, 2010b; Farrell and Twining-Ward, 2004; Faulkner and Valerio, 1995; McKercher, 1999; Russell, 2006).

Oriental thinking and complex systems

The systemic approach described so far leads us to consider it as having something in common with the attitudes developed in the Eastern world. We refer here to that group of philosophies and religions originating in India, China, Japan, Southeast Asia, and Arabic countries and that we may collectively call Eastern philosophies. They have been regarded by some scholars as well aligned with the new complexity approach to the study of systems (Baskin, 2007; Foo, 2008). Taoism and Zen Buddhism, in particular, seem especially close to the ideas and the principles put forth by the modern chaos and complexity theories (Barker, 1996; Ma and Osula, 2011) .

One of the main distinguishing traits of these views is their contrast with the western accent on empirical verification and on the reductionist analysis to the comprehension of natural and human phenomena. They are, on the contrary, focused on the relationships among individuals within a society and with nature and on how they relate, interconnect and behave collectively by exploring the outcomes of this collective behaviour.

As Jullien (2004a) maintains, the Western thinker worries, in a Platonic way, about going beyond the exterior manifestations of the World in order to acquire a superior view and capture the true principles, while the Chinese vision is concerned about shifting from a partial to a global perspective on natural phenomena, considering the similarity as well as the inadequacy of all partial perceptions.

Taoists believe the same natural laws that rule the universe regulate human affairs or even the human body. This is analogous to the concept of self-similarity, one of the characterizing features of a complex system (Levin, 2003). Moreover, Jones and Culliney (1999), observe the correspondence between Taoism and chaos theory and the ideas about the unpredictability of systems' behaviours.

As noted above, even the smallest variation in the initial conditions of the parameters controlling a system may lead to very diverse configurations of the system at a certain time, what is commonly known as butterfly effect. This effect is the main cause of the substantial unpredictability of future behaviours of a complex system. Or, to say it more rigorously: it is impossible to predict which among many possible stochastic paths originating from a certain point in time and space the system will move onto. The only possibility is that of building different future scenarios (ensemble of paths) and explore how certain actions or condition may affect the their likelihoods. The same idea is found in the Zen's belief that it is impossible to fully comprehend or foresee everything, and in

the necessity of a harmonic prospering in the environment while adopting a limited set of rules. These rules will guide the actions when designing and engineering systems (Joskovich, 2012; Wallace, 2003).

The evolution of the system may go through different stages and a self-organizing system often advances toward the edge of chaos, a domain between purely chaotic and simple stable configurations (Lewin, 1999). This configuration is considered by many to be the ideal one for ensuring the evolutionary growth of social and economic organizations like tourism operators or destinations. In fact, the economists' dream of a stable equilibrium might turn out to be detrimental for the development of the system, since evolution and growth can only be possible in dynamical regions of the phase space at the boundary between order and chaos (Baggio and Sainaghi, 2011; Chen, 2008; Rosenhead, 1998; Russell and Faulkner, 2004). In a Taoist framework, the edge of chaos is something akin to the position of the wise man, well balanced between the yin and yang dual concept (Jones and Culliney, 1999).

Same considerations can be made when tourism systems management or governance are taken into account. As Ma and Osula state (2011: 101): "leadership practices at all levels of the organization should align with the overall system (i.e. Tao) or will be out of harmony. The idea of the macrocosm existing within the microcosm means that the same principles that operate within large systems (universe) also operate within small systems (humans and interpersonal relationships)." That is to say that we need to well consider the idea of using an adaptive attitude to the governance of a system (Holling, 1978), rather than a rigid deterministic, authoritarian style, and use flexible experimental paths by exploring alternative possibilities, examining the outcomes and realizing which one best leads to the desired objectives (Armitage *et al.*, 2009; Patterson *et al.*, 2008; Reed, 1999). Again, all prescriptions or suggestions that can be found in texts such as the famous Sun Tzu's Art of War (Sun Tzu, 1982) or traced to the less superficial and spectacular and more profound aspects of oriental martial arts training (Deshimaru, 1982; Henning, 1999; Holcombe, 1990; Ratti and Westbrook, 1999).

Concluding remarks

There is little doubt that philosophical, epistemological and even religious convictions play a crucial role in shaping the attitudes of scientists and researchers in addressing the problem of understanding natural, social, economic or technological phenomena and systems (Evaristo *et al.*, 2005; Guiso *et al.*, 2003, 2009; Thijs and Berg, 1995; Vickers *et al.*, 1998; Weber, 1930). The influence of a possible cultural bias in research activities has been highlighted several times as the long history of human thought demonstrates (Geymonat, 1972; Losee, 2001).

In this contribution we argue that Western thinking, mainly with its mechanistic and reductionist view, has conditioned the way tourism (but not only) studies have been and are conducted and has provided only a partial view of the phenomenon. Moreover, this approach has been unsatisfactory in its capability to account for the many different behaviours of tourism systems, even in seemingly comparable environmental or internal configurations. This constitutes an important issue that increases the difficulties of all those interested for theoretical or practical reasons in the functioning of tourism organizations for better governing their present and future settings.

A new approach is deemed necessary, as some scholars have already clearly pointed out (Farrell and Twining-Ward, 2004). This can only be a systemic approach that considers a tourism system as a complex adaptive system. In this framework, the study of structural and dynamic characteristics

provides a rigorous theoretical foundation to serve as basis for the actions (and the attitudes) of all those interested in the area. This approach, although not yet completely and widely diffused, has shown to meet many of the expectations (Baggio *et al.*, 2010a).

By briefly examining the analogies and similarities between Eastern thinking and systemic attitudes in the study of complex systems, this paper puts forward an additional direction. In the new era of globalization, cross-fertilization of Eastern and Western thinking styles can be able to promote the further development of systems disciplines. Western practitioners and scholars may benefit from a closer study of the Eastern civilizations and a deeper understanding of these ancient wisdoms. As Jullien suggests in his works (Jullien, 2004a, 2004b), the Western world can learn a great deal and acquire more profound intellectual tools to better understand the complex phenomena we face, if it confronts and understands Eastern cultures by judging the strengths and the weaknesses of both approaches in the endeavour of widening our cultural horizon.

From a researcher or a practitioner viewpoint this means being able to employ a more creative methodological approach in investigating structures and dynamic behaviours. In turn we can think of setting governance styles thus significantly influencing the design and functioning of our increasingly complex and globalized tourism systems.

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