



The Flowing Stability of Cultures: Insights from Complexity Studies

Fulvio Mazzocchi^{1*}

¹ CNR, Institute for Complex Systems, Monterotondo (RM), Italy

ABSTRACT In this paper the contribution that a ‘systemic’ view can offer to the understanding of the concepts of culture and cultural diversity is outlined. This is done by means of a transposition of ideas from one domain of application (contemporary science) to another (the study of cultural phenomena). Insights are gained from the conceptual frameworks of systems theory and complexity science. The idea of a (culturally-based) pluralism in knowledge is made intelligible by referring to the epistemological stance of complexity, and the ‘order from noise’ principle used to draw insights with respect to intercultural dynamics.

KEYWORDS Complexity theory; cultural diversity; pluralism in knowledge; constructivism; order from noise

The language and ideas of science often infiltrates the ordinary language and our perception of the (natural and social) world. This circumstance does not however necessarily mean that the process is informed by the most recent scientific findings. At the same time the specialisation and fragmentation of research areas and the consequent breakdown in communication among scholars of different disciplines limits the possibility of genuine and productive exchanges at an academic level. What is attempted here is a transposition of concepts from one domain of application — contemporary science — to another — the study of cultural phenomena. On one hand, I am aware that this operation should be performed with caution to avoid unwanted simplifications or spurious juxtaposition. On the other hand, I also believe that the search for possible analogies and connections between different domains is a useful heuristic tool from which novel viewpoints and insights may be gained.

The contribution that a ‘systemic’ view, above all in the form of complexity theory, can offer to the understanding of the concepts of culture and cultural diversity is outlined. First, a conceptualisation of the notion of culture from the systems and complexity theories standpoint is suggested. The importance of cultural diversity as a reserve of cognitive tools is then illustrated using the language of thermodynamics. Next, the idea of pluralism in knowledge is made intelligible by referring to the epistemological stance of complexity which takes into consideration the role of the observer. Finally, it is highlighted that the ‘order from noise’ principle may draw insights with respect to intercultural dynamics.

* E-mail address: fulvio.mazzocchi@isc.cnr.it

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1. Cultures as flowing equilibria

In the globalised and highly interconnected world the proximity among different traditions is increased exponentially in a way that it does not have a precedent in human history. Such a continuous increase in the level of connection on a planetary scale urge us to become more aware of the world as one interlinked entity, but we have at the same time to be prepared to face new complex problems, such as those associated with the relationship between different societies, cultures and forms of knowledge.

There is the urge to learn how to live together in a better and more productive manner. As stated by the anthropologist Clifford Geertz:

“To live in a collage one must in the first place render oneself capable of sorting out its elements, determining what they are (which usually involves determining where they come from and what they amounted to when they were there) and how, practically, they relate to one another, without at the same time blurring one's own sense of one's own location and one's own identity within it (...) We must learn to grasp what we cannot embrace” (Geertz 2000, p. 287).

Which notion of tradition or culture is used is important here, and this has been influenced in the past also by the modern science view. Cultures are often seen as closed and separate systems as if they were items of the Newtonian mechanics. They tend to be conceptualised as homogenous items with fixed borders. Such presumptions, however, above all in the contemporary age, are highly questionable. Humanity is not fragmented into a plurality of totally impermeable cultural ‘islands’. As a matter of fact, exchange between societies have always occurred, although some of them are more isolated (e.g. being allocated in very remote places). Of course, a certain degree of closure is needed to ensure the stability of a culture and to preserve its identity in time. This can be ensured only if there is some loyalty toward the values and principles of a given tradition, and as a consequence, if there is a kind of (partial) impermeability toward the values and principles of other traditions (Levi-Strauss, 1983).

Nonetheless, there is always the risk such a functional closure to be transformed into a limiting one, where there is a sort of uninterrupted looking at oneself in a mirror which continues to tell us the same things, by using the same language. To avoid such a risk, the closure item should be integrated with a simultaneous and complementary openness.

New ways of conceptualising the notion of culture have to be found. If we turn once again to the development of science, a possibility is to do this in terms of a *stationary state*. A system in such a state has to remain open to continue to live, as this depends on the possibility to exchange matter and energy with the environment. At the same time, in order to preserve its structure and identity, it has also to establish a closure toward the outside world. It is a kind of stabilised dynamism which Ludwig von Bertalanffy (1968), described in terms of a *Fliessgleichgewicht* (flowing equilibrium). Socio-cultural worlds could then be seen (more or less metaphorically) as flowing equilibria or rather as dynamic entities which co-adapt to and co-evolve with their ever changing environment.

They can even be conceptualised as complex systems. They are organised according to multiple levels – cultural, social, biological, chemical, physical (Pickel, 2007) – and can be seen as unpredictable systems whose development is highly sensitive to initial conditions, in the sense that a difference in such conditions can strongly impact their future development favouring their divergence (Teerikangas & Hawk, 2002). They are compound by many highly interrelated components being themselves complex systems. Cultures are in fact formed by other cultural organisations (such as subcultures) and aggregate to produce more general items (such as macrocultures). Besides, the role played by the (often antagonistic) dynamics between individuals (the parts) and cultural organisations (the wholes) should be taken into account (Teerikangas & Hawk, 2002). There are various reasons for which the individual level should be included in the investigation. In the first place, in a ‘holographic’ sense, if on one hand individuals are ‘contained’ within socio-cultural worlds on the other hand they also ‘contain’ such worlds within themselves as they have become socio-cultural agents by incorporating given (socio-culturally biased) systems of

ideas and values (Morin, 2007).¹ Next, individuals play an essential role in the production of cultural diversity for it is in them that in the first place diversity resides. Even huge processes of social or cultural transformation are frequently prompted by the thought-provoking ideas of independent thinkers or activists. As a matter of fact, the ways in which intellectual creativity manifests are unpredictable and, under the right background conditions, even what appears as an idiosyncratic contingency can provoke global, dramatic consequences. This is sufficient, I guess, to understand the shortcomings inherent in approaches studying cultures as if they were homogenous (and not multidimensional and internally differentiated) items and which lead towards processes of reification and essentialisation.

The possibility to gain insights from the developments of contemporary science does not provide however a motivation to think that the right way for studying cultural phenomena consists only in replacing a scientific-based approach (the Newtonian one) with another (the complexity one), even if reductionism is surpassed and a more comprehensive worldview adopted. Cultural phenomena implying in fact a highly subjective dimension: they cannot simply be objectified (Teerikangas & Hawk, 2002), although we can still analyse them from a scientific standpoint too. Rather they should be studied by taking a pluralistic and interdisciplinary stance, and in the light of different cultural perspectives.

2. Cultural diversity is necessary as biodiversity is for nature

Our current historical moment requires in-depth reflection about the value of diversity (and redundancy) at different levels, and actions aimed at preserving them, as it has occurred in the biological and ecological sciences. Cultural diversity is necessary as biodiversity is for nature. It is the common heritage of humanity which has been developed over the ages. In such a heritage, which fosters multiple pathways to knowledge, resides a potential source of creativity and a reserve of cognitive tools for the future.

The assumption of any single system of belief (e.g. Western science), along with its methods and operational criteria, as the only universal system, risk triggering a process of cultural simplification and erosion. The uncritical acceptance of only one single threshold within which knowledge that satisfies the legitimate epistemic criteria lies, might in time reduce a multidimensional cognitive space into a monolithic structure (Mazzocchi, 2006).

We may understand the risks posed by the 'one and only way of thinking' referring by analogy to the second principle of thermodynamics. The tendency in nature towards an increase in entropy or disorder, brings about a loss of information and available energy. The thermal death (thermodynamic equilibrium) is one of the possible final states of the universe, in which the maximum entropy is reached. No more free energy to perform work or sustain life is available. Living systems avoid thermodynamic equilibrium by self-organisation. They are open systems that exchange materials, energy and information with the external environment but at the same time they maintain an organisational closure.²

Both the elimination of differences (by eliminating any temperature difference a leveling of energy would take place and useful exchanges would be no longer possible) and the complete isolation (with a consequent increase of internal entropy) would lead to a thermal death. Similarly, the destruction of 'biocultural' diversity (Maffi, 2005), the one and only way of thinking — but also the complete closure of a cultural system from any exchange with the external environment or a lack

¹ In Morin's view the parts and the whole are always interconnected, in the sense that the parts can be found in the whole and the whole can be found in the parts.

² This point is crucial for the theoreticians of autopoiesis according to whom each structural change of living systems is necessarily subordinate to the preservation of their organisation scheme, i.e. of their identity (Maturana & Varela, 1980, 1987).

of flexibility — are ‘thermodynamic mistakes’ as they could lead to a sort of ‘anthropic euthanasia’ (Tiezzi & Marchettini, 1999).

These arguments can of course be related to the globalisation issue. Some scholars (e.g., Appadurai, 1996) recognise in globalisation a condition which fosters cultural creativity and diversification. On one hand in fact it brings about standardisation and homogenisation. And yet on the other hand, supported by advances in the fields of information and communication technology, it favours also intercultural exchanges and the circulation of a multitude of cultural forms (even those representing the standpoint of minorities) in new worldwide spaces, such as the cyberspace.

While I recognise the point, I still have some objections to it. It is the ‘quality’ of the diversity that has to be scrutinized. It is true that socio-cultural worlds are coming into contact more than before. And yet this occurs in a globalising context which has been created by a specific society (our). In most cases, the others have been found in it in spite of themselves (and sometimes they have been deeply transformed by taking part in it). The fact is that the encounter between different cultures does not take place on an equal footing, but in a setting which is populated by hegemonic notions and models (of what rationality means, of state or economy, etc.). Rather often processes of cross-cultural hybridisation are based on the combination of bits of knowledge or cultural items which are extracted from the overall framework in which they have evolved and concern only the superficial level not having the strength to impact the dominant discourse. Besides together with the development of new forms of cultural creativity, I see also a gradual decline of diversity (of languages, systems of belief and value, practices, etc.). Is it not true that differences are becoming more subtle and even hard to be perceived?

3. Making sense of pluralism

Our sense of reality is shaped by multiple sources, and yet scientific thinking plays a predominant role. We live in a world which is permeated by science, which in turn has been developed by interacting with nature. The (epistemic) principles on which science as a knowledge system is founded have been tested and experienced for many centuries. As stated by Paul Boghossian:

“ ... we defer to the deliverances of science: we assign it a privileged role in determining what to teach our children at school, what to accept as probative in our courts of law and what to base our social policies upon. We take there to be a fact of the matter as to what is true. We want to accept only what there is good reason to believe true; we take science to be the only good way to arrive at reasonable beliefs about what is true, at least in the realm of the purely factual” (Boghossian 2006, p. 4).

At the same time, we cannot ignore that in other historical periods or socio-cultural settings, different (but in principle equally plausible) ways of understanding and describing the world have been developed. The adaptive value of most of them has been proved over the centuries.

Any system of knowledge risks incurring in a process of crystallisation in which the categories that are projected on reality are mistaken for it. To avoid such a danger requires once again a double movement: one of closing and one of opening. Without a certain degree of closure there is not identity; without a certain degree of opening there is not a (real) capacity of exchange and dialogue with the world. In this framework, on one hand we need established paradigms of thought to cognitively organise our worlds, but on the other hand we need also ‘deforming’ lens which show us that our image or ‘version’ of reality is not reality as such but what we can grasp of it from our cognitive horizon.

Relativism is not however the solution here, and certain forms of multiculturalism risk involving a new kind of objectivism which is ‘broken into pieces and multiplied’ (Feyerabend, 1987). At the same time, a pluralist account of reality can be made intelligible by referring to a notion of knowledge which takes into consideration the role of the observer. Second order Cybernetics, and then the epistemology of complexity, brought about the idea that investigating the observed systems (that form an outside world from which the ‘subject’ is often seen as separated) is not enough. We have also to investigate the observing systems (which are closely intertwined with the former) (von

Foerster, 1982). An observer describes the world from the inside. She is confined in her situated cognitive domain (Maturana & Varela, 1980, 1987), and consequently does not probe reality in a neutral or unbiased manner. There is a constructive aspect to be taken into consideration. In this sense, there is no account of the world that is not at the same time an account of the observer who is describing herself while she is describing that world (Gargani, 1979).

Knowledge, even scientific knowledge, is produced by the interaction between the world and the subject who experiences it (which is still part of the world). Eliminating the former means to remove what can be experienced. Eliminating the latter means to remove who can experience it (Morin, 1986, 1990). Put in other words, knowledge involves a process of mutual specification between a living system and its world-environment, which co-emerge simultaneously.

Not only the epistemology of complexity emphasises the need to renounce the ideal of the neutral observer, but it also advocates adopting multiple strategies and levels of understanding. Complexity has been described as the property of a system which corresponds to the difficulty in describing and modelling it. There is no single one formalism or conceptualisation (theory, model, experimental conditions, etc.) which is able to capture all the properties of such a system (Rosen, 1987). Multiple different (scientific) ways of investigating and interacting with it are required. A similar view has been expressed in claiming that different viewpoints can complement each other and be vicarious in building a cognitive universe (Ceruti, 1994; Mazzocchi, 2008).

Though philosophically challenging (see for example Boghossian, 2006 for a critical discussion about epistemic pluralism), this ideas may offer insights with respect to how to deal with the multitude of culturally biased systems of knowledge, which are still expression of the same species and life form (Wittgenstein, 1958).

This epistemological view can offer insights into how to problematise the notion of the 'anthropological investigator' too, insofar it is recognised that her description of the world and other societies is always a description made from a 'centre' (usually the Western vantage point) toward a 'periphery'. When a condition of universality is constructed this is hence strictly related to the simultaneous construction of a condition of alterity (otherness) (Said, 1978). Dismantling this kind of (ethno-, cognitive-) centrism would require provincialising the centre/privileged vantage point and unveiling how cultural items are often progressively reified in the process of becoming objects of investigation. In point of fact, not only an anthropology as we know it is in principle possible but also other kinds of anthropologies which look at the world from different culturally-biased vantage points. Even our socio-cultural world can be put under perspective and transformed in an object of study for an outside observer.

4. Knowledge is selective

In the confrontation with other (cultural) views may reside the chance to grasp something really 'new'. By deconstructing the sense of reality which we are accustomed, by envisioning other *possible* worlds populated by foreign items, it could be realised that, under the appropriate conditions, what appears from a given standpoint as a 'mistake' or very unusual can be entirely legitimate and natural (Feyerabend, 1999). Changing perspective may then help us recognising to have one (i.e. our own particular perspective). Linking different viewpoints can become a means to be decentralised and to decentralise as well. As stated by Geertz:

"... the reach of our minds, the range of signs we can manage somehow to interpret, is what defines the intellectual, emotional, and moral space within which we live. The greater that is, the greater we can make it become by trying to understand [what others] are all about (...) the clearer we become to ourselves both in terms of what we see in others that seems remote and what we see that seems reminiscent, what attractive and what repellent (...) It is the asymmetries (...) between what we believe or feel and what others do, that make it possible to locate where we now are in the world, how it feels to be there, and where we might or might not want to go"(Geertz 2000, p. 77-78).

Each (cultural or theoretical) point of view opens a gateway to the (description of) reality, and yet it closes at the same time other possible descriptions. Put in other words, not only is knowledge about gaining insights into the nature of reality, i.e. to see how things are (although from a situated standpoint), but it entails the creation of shadow zones too. A similar argument has been discussed in science too, namely in quantum mechanics. Niels Bohr's principle of complementarity asserts that, for investigations at the subatomic level, light exhibits different properties depending on the experimental conditions in which the measurement is made. Some phenomena (e.g. diffraction patterns) are best explained if light is regarded as electromagnetic waves, whereas others (e.g. the photoelectric effect), require light behaving like particles. Two (mutually exclusive) accounts are then required to explain the same phenomenon and these should not be regarded as contradictory, but as complementary (Bohr, 1958).

Such a principle — together with the principle of indetermination — may be a partial expression of a broader cognitive principle, according to which what appears to us as reality — our reality — is always the result of a filtering process taking place at different levels. In order to see something, something else must necessarily be excluded from the vision (Mazzocchi, 2010). This awareness of knowing partially (which then implies a sort of Socratic element, i.e. the knowing of not knowing) may help us to more clearly delineate the boundaries of our cognitive world (that form our identity in a complex world of multiple identities). At the same time, it might help us to make it more open and, as a consequence, to gain more genuine interest in other ways of knowing.

5. 'Noise' may be a source of novelty

Being open to the otherness, which risks also creating some confusion, means also to adopt an attitude of receptiveness towards the 'noise' that such an otherness carries with itself. It means to recognise that the integration of noise is often a necessary (although not sufficient) condition for triggering processes of development of new organisational forms.

The universe contains within itself noise and disorder. The latter should not necessarily be expelled or isolated but rather, at least within certain limits, can be integrated in the organisation. Too much order can produce rigidity and paralyse the natural dynamics. Nature uses noise as a source of innovation (new order). The principles of 'order from noise' (Atlan, 1979; von Foerster, 1982) and 'order from fluctuation' (Prigogine, 1976) are all expressions of such a principle. This is one of the lessons gained from complexity science, which has been used also to investigate how both order and disorder characterise social and cultural systems (Urry, 2005).

Similarly, 'information' and 'noise' (as they are conceived in information theory) cannot be separated since they are mutually intertwined and dependent. Their relation too can be conceptualised in terms of an interaction between order and disorder. Noise, which is unexpected and usually comes from outside, functions as a perturbation which can increase the complicatedness of a system or also be destructive. Yet it can be 'creative' too, by triggering processes of change or restructuration and being a source of novelty (Serres 1982a; Taylor, 2001).³

This implies that if systems become too rigid to adapt themselves to changing circumstances, they collapse; but at the same time if there is no stable configuration which establishes an identity — and includes a 'code of signification' which is able to assign a meaning to such a noise and to process it — noise can also be very damaging.

What is seen as noise or information should not be intended however in an absolute sense, but only with respect to given circumstances. What is noise in a given situation, it can be seen as information in another. We have then once again to include the role of the observer in the process and her possible points of observation. At the most basic level the complementary role of the

³ We have discovered for example that the properties of life exist far from equilibrium, on the border between order and chaos (Kauffman, 1993). Noise plays an important role in maintaining such a condition by preventing living systems to become static.

viewpoint which is internal to the system and the viewpoint which is external to it should be recognised. These should be considered as mutually dependant and co-emerging as one arises from the other (Ceruti, 1994).

Michel Serres has investigated in depth such a question, arguing as follows:

“Consider any level of an interlocking system. Locally (...) it operates like a series of chemical reactions at a certain temperature (...) Let us consider only the energy conditions at this one level. It mobilizes information and produces background noise. The next level in the interlocking series receives, manipulates, and generally integrates the information-background noise couple that was given off at the preceding level. How does this take place? (...) Indeed, if one writes the equation expressing the quantity of information exchanged between two stations through a given channel and the equation which provides this quantity for the whole unit (including the two stations and the channel), a change of sign occurs for a certain function entering into the computation. In other words, this function, called ambiguity and resulting from noise, changes when the observer changes his point of observation. Its value depends on whether he is submerged in the first level [viewpoint which is internal to the system] or whether he examines the entire unit from the next level [viewpoint which is external to the system]. In a certain sense, the next level functions as a rectifier, in particular, as a rectifier of noise. What was once an obstacle to all messages is reversed and added to the information. This discovery is all the more important since it is valid for all levels. It is a law of the series which runs through the system of integration” (Serres 1982b, p. 77-78).⁴

If we conceptualise the voices of the foreigner, i.e. the ‘voices’ coming from outside of our cultural space, as noise, it is possible to assign two different meanings to them depending on the perspective employed. From an internal point of view (to our cultural milieu) this noise is often considered only as a factor of disturbance. At minimum it has to be ‘translated’ in some kind of order to become understandable. But it can also act as a perturbation which risks to complicate our social structure and to challenge our fundamental assumptions. It is something to cope with to preserve our cognitive organisation.

However, from a hypothetical wider (and external) point of view, i.e. the point of view of the integration of the system into a meta-system, this same noise can be able to trigger an evolutionary transformation. Instead of searching to eliminate or neutralise it, this can be used to generate novelty, by integrating items and differences before excluded or marginalised. Of course, this requires flexibility and adaptability of the systems involved. And yet, if such is the case, noise is not anymore a mere factor of disturbance, but it can be a real opportunity.

6. Concluding thoughts

The multiplicity of different cultures and systems of knowledge has brought about different ways to make the world meaningful. This does not entail however that every cognitive enterprise is feasible – reality offers resistance – neither that all knowledge systems have to be seen as necessarily possessing an equal value. Any cultural understanding of reality is somehow limited to what can be grasped from a given vantage point. And nevertheless, we can still expand our (experiential and conceptual) cognitive space by learning to shift our viewpoints and by integrating the ‘noise’ coming from outside. Furthermore, unexplored conceptualisations can always be discovered and new knowledge produced by bricolage or cross-cultural hybridisation. At last, the fact that different

⁴ This idea was also taken up by Henri Atlan who investigated biological organisation in the light of information theory (see for example Atlan, 1974).

societies and cultures occupy different (cognitive) ‘niches’ is not in contradiction with the supposition that they all belong to the same actual world (Mazzocchi, 2013).⁵

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⁵ In previous works (Mazzocchi, 2011 and 2013), I described the philosophical position which I sustain on this matter — which concerns the cognitive sphere but opens up a series of issues involving other levels too (e.g. the ethical level) — in terms of a ‘constructive realism’:

“Our’ world, i.e. the shape of the world we ‘see’ and in which we live, is in a sense relative to us (i.e. to a given culture). A multiplicity of culturally-biased ‘world-versions’ could exist. Nevertheless the possibility of developing them still depends on the existence of something beneath them, functioning as their source and not itself a version. This dimension can be seen as highly flexible but it cannot be forced into whatever any structure. It is not inert (as enclosed in itself) but offers resistance, and is capable of interacting dynamically. Although there may be different ways of adapting to this resistance, the latter limits the ways open to us to describe or classify reality. Many but not all of them are possible or produce the expected results. (...) Self-consciousness triggers a process of separation for which we become subjects in contrast to an objective world outside us. And yet reality-as-a-whole contains both dimensions. It is both the object of our investigations, and (in the) the subject carrying them out. From this angle, reality is not relative to us but rather it includes us. The world is (formed or constructed) in the observer’s mind, and yet the observer’s mind is (formed) in the world” (Mazzocchi, 2013, p. 372).

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About the Author

Fulvio Mazzocchi

Fulvio Mazzocchi, biologist and philosopher, is a researcher at the Institute for Complex Systems of the Italian CNR (Consiglio Nazionale delle Ricerche). He is involved in investigating complexity theory from a philosophical point of view. In particular, he is concerned with the epistemology of complexity. His research also focuses on analyzing complexity as a new paradigm, especially with respect to the reductionist-holism debate.

He is active in the field of knowledge organization too. His main interests are the philosophical and theoretical foundations of knowledge organization. In addition, he has participated in many projects concerning the construction and development of Knowledge Organization Systems (KOS), such as thesauri.