# Creative industries & cultural science: A definitional odyssey

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**Abstract.** This paper argues that the definition of cultural science depends on the definition of creative industries. The problem, however, is that unlike the definition of evolutionary economics, complexity science and new cultural studies, which are also elements of cultural science, the creative industries suffer multiple non-commensurable definitions. These are reviewed and analytic implications for the definition of cultural science are examined.

# 1 Introduction

There are two overarching conceptual issues before us:

(1) What are the creative industries?
(2) What is cultural science?

In this paper, I propose to address both by focusing on how they interrelate (and thus in the manner of Ormerod 2008). Toward this, I shall review the extant definition of the creative industries along with a series of recent endeavours by the CCi to redefine the creative industries from theoretical first principles. I then connect this to the program of cultural science, which I define as:

> **cultural science** = new cultural studies + evolutionary economics + complexity theory + creative industries

There are two problems here. First, with how these all fit together, which I will address in the section 3, and second, with the meaning of creative industries. This will be the subject of section 2. The methodological implication is that we cannot proceed to develop cultural science until we have first examined what is meant by creative industries. (Allowing of course that complexity theory, evolutionary economics and cultural and media studies are all reasonably well defined domains. This is a far from obvious statement, yet I shall not enter into such debates in this paper.)

An immediate observation and potential criticism of my cultural science definition is that the last element – creative industries – may be redundant. That is, its very definition may be bound up precisely with the interaction between the other three elements. As will become apparent, I am broadly inclined toward that interpretation, a great merit of which is that it then skirts one of our two problems – specifically, the definition of creative industries. Yet I shall nevertheless proceed with definitional examination in order to highlight the problem at issue, which is that creative industries has multiple and distinct definitions that draw attention to different aspects. Yet it is only by examining these definitions as a whole – and I have identified 18 (technically, 16+2) distinct definitions below – that we may appreciate the sense in which a cultural science approach may provide a deeper analytic foundation.

Definitional debates, along with methodological papers, have a bad reputation of being sterile or less worthwhile than 'real' research or inquiry. Yet the creative industries present a genuine definitional problem, such that the sets of economic activities that gather under its heading have multiple possible interpretations with very different implications. This paper will therefore attempt to review in brief the different definitions toward highlighting a coherent basis for cultural science foundations (as opposed to defining and classifying for the purposes of developing creative industries policy).

## 2 What are creative industries?

The standard origin story of the creative industries has been told many times. With variations, it goes something like this.

Once upon a time, there existed a broad swathe of economic activity called the cultural sector. This was well defined in its economic aspect by its persistent and utter failure to produce economic value. But that was okay, because it did produce cultural value, and was important because of this for social, political and cultural reasons. Its economic justification, however, was limited to spillovers associated with cultural tourism. Since the formation of the Arts Council in the UK and the National Endowment for the Arts in the US (both in the 1930s), a policy equilibrium has since been maintained in which the economic system transferred resources to the cultural system in proportion to this estimated cultural value.

But this equilibrium was disrupted in 1998, when a new view was proposed and foisted by the DCMS, a branch of the UK government, which sought to re-conceptualize the cultural economy into a new and broader industrial classification called the 'creative industries'. The DCMS redefined this sector through an extensive inclusive classification that sought to gather all industries that have *creativity* as an input and *intellectual property* as an output. A new industrial sector was thus proposed as the creative industries, and thus defined so as to include in both industrial and occupational classifications: architecture, advertising, arts & crafts, design, fashion, performing arts, music, TV, film & video, digital games, publishing and new media, and interactive software.

The *cultural industries* is thus **Definition #1**: namely the set of economic activities that produce cultural goods and services. This is the definition that underpins in much political economy analysis, including extensions into analysis of cultural geography or media studies, and which is the default position in, for example, the *Journal of Cultural Economics*.

The modern definition of the creative industries – **Definition #2** – is the standard DCMS (1998, 2001) definition of 'creativity in – IP out'. This is the new definition, and is represented by, say, Hartley (2005), Cunningham (2006), and the *Creative Industries Journal*.

This is closely related to **Definition #3**: which is to define it in terms of the *copyright industries*, which is broader than creative industries in that in includes distributional

channels as well. This definition emphasizes the intrinsically commercial nature of these industries and views intellectual property as its institutional basis.

**Definition #4** (closely allied with #2) is the *creative economy* definition associated with the likes of John Howkins (see also Cunningham 2006). This definition is broader than the creative industries definition in that it is focused on creative activities across the economy, rather than with reference to a particular set of sectors. While this definition is inspiring, it has yet to receive a formal definition.

**Definition #5** is a related hybrid definition that combines #2 and #4 into the *Trident model* definition (Higgs, Cunningham and Bakshi 2008). This combines both occupational and employment classifications to distinguish between embedded and core creative industries, both as distinct industries and as embedded occupations.

**Definition #6** however is the pure labour market or *creative class* definition associated largely with the work of Richard Florida (2002, 2005, 2008) and recently Elizabeth Currid (2007). This model ignores the industry focus and instead concentrates on spatial competition (e.g. between cities). In this view the creative industries are defined in terms of an occupational class of economic behaviours (creative or knowledge workers). This subset of agents has preferences to live next to each other in order to realise positive externalities. The creative industries, in this view are a self-organizing phenomenon that explains, among other things, urban agglomeration and increasing returns. This definition shades into the work of endogenous growth economists such as Ed Glaeser.

**Definition #7** is an older idea, and in many ways an outgrowth of definition #1, in terms of a *core/periphery model* of creative activities. This model, which is associated with the work of David Throsby emphasises the notion that at the core of the 'cultural industries' are the creators of pure art and culture. Moving out from that are layers of associated services and derived value industries that are ultimately ringed by the purely commercial aspects of the industry. In this model the cultural/creative core creates the value that others parts of the industry exploit.

**Definition #8** is the *special economics* definition, associated with, for example Richard Caves (2000) or Art DeVany (2004) and at this workshop Paul Ormerod (2008). This is a perhaps strange definition, and not one that can serve industrial or statistical classification purposes, but what it does do is to highlight the systematically peculiar economic coordination problems involved in this sector (e.g. Caves from the transaction costs perspective, De Vany and Ormerod from the power law perspective). This aspect also invokes information economics arguments and knowledge economy arguments.

**Definition #9** is perhaps less a definition as a useful categorical observation, namely that the creative industries are core parts of the *service economy*. This definition overlaps with notions of creative industries as illustrative of the knowledge economy, and also with definition #6 (creative class), definition #4 (creative economy) and also definition #8 (special economics). This conceptual discrimination has been widely made (see Metcalfe and Potts 2007) and leads to the focus on the role of the creative industries in not just the study of the production of services but also in the process of innovation in services. To the extent that innovation in services differs from that in

manufacturing, this is a further research aspect of definition #8. This point also connects directly to new innovation system arguments in relation to creative industries definition (Cutler 2008, Mathews 2008, Potts 2007a).

**Definition #10** relates to the role of the creative industries in the process of *Schumpeterian economic growth* and evolution. While this is not strictly a separate static definition, as the argument is constructed over definitions #2, #3, and #4, it does serve to redefine the creative industries in relation to growth dynamics. Potts and Cunningham (2008) advanced four models of creative industries growth that ranged over negative, neutral, positive and evolutionary. Evidence supports the latter two models, although this effect was conditional upon specific definitions. An important implication, however, was that for a broad range of definitions, the creative industries should be viewed in policy terms as more closely related to innovation policy than to cultural policy.

**Definition #11** is closely related to definition #10, but instead puts the focus on the role of *markets and market institutions*. In this definition, the creative industries are understood by their felicity with market processes. The champion of this interpretation is Tyler Cowen (1998, 2002, 2005). This argument has been further developed toward Austrian and evolutionary economic views of market processes in Potts (2007a, 2007b, 2007c, 2008a), Chai, Earl and Potts (2007), and also in the work of Bruno Frey, Eric Jones, and indeed most economists (as opposed to political economists) who have ventured into the fray of the economics of the arts, culture and creativity. The key point here is that the institutions of markets (and market capitalism) are conducive to creative industries; indeed, they thrive under such conditions. The rise of liberal market globalization since the early 1980s correlates with the rise of the creative industries (Potts 2006, 2008). The purpose of this definition is to emphasise the notion that creative industries produce private goods with significant spillover, as distinct from public goods. There are immediate and obvious policy implications (and socio-political implications), but the point to emphasise is that the debate is about the nature of the economic value produced. Definition #11 insists that creative industries value is largely a product of markets working, not failing.

**Definition #12** is the logical extension of this point by connecting it back to enterprise, namely the *social network markets* definition of the creative industries (Potts, Cunningham, Hartley and Ormerod 2008). This definition puts an entirely new dimensional construct into play, namely the measure of novelty bounded by creative origination and mature industry. In this definition, all industries went through a creative industries phase at some point, and thus the definition of creative industries as elements of a population is always changing, but the principles of the definition remain the same. These are the coordination of novel ideas in proto-markets of social networks, often in conjunction with systems of mature markets. The creative industries are therein defined as 'The set of agents and agencies in a market characterized by adoption of novel ideas within social networks for production and consumption.' The creative industries are thus the set of economic activities that involve the creation and maintenance of social networks and the generation of value through production and consumption of network-valorized choices in these networks.

**Definition #13** is in part an aspect of definition #12, but it is also a broader point about economic classification in the notion that the creative industries represent the *attention economy*. This concept is associated with a number of scholars in different ways: e.g. Earl and Potts (2004), Lanham (2005), Hartley (2007), Currid (2007), Ormerod (2008). The central idea here is that the creative industries are defined in terms of the aspects of economic activity that derive value from the creation, fabrication, maintenance and operational use of the *scarce resource* of attention. This in part draws analytic attention to the institutional and infrastructure aspects, but at the same time to the nature of the human mind and its cognates. Fashion is perhaps the leading part of the attention economy (Hartley 2008), but this can be very broadly defined (Potts 2007c).

**Definition #14** – *multiple games & identity* – is more in the realm of speculation at this stage (Banks and Potts 2008), but involves a variation on definition #12 that is interesting because it feeds directly into cultural science. It is an entirely microeconomic definition, and thus different from #12, which is meso and macro. The idea is that creative industries are defined by contexts of simultaneous economic choice and cultural choice over the same proposition. This implies that a single choice must accommodate both aspects of identity (Akerlof and Kranton 2000, Davis, 2005, Hermann-Pillith 2008, Potts 2008e). This definition thus seeks to identify the creative industries with a class of human behaviour that is simultaneously cultural and economic. This complex behaviour is, I suggest, at the core of the definition of cultural science.

**Definition #15** comes from attempting to find a better definition of *creativity*. This thus eschews the industry focus, and seeks to identify the essential economic and cultural aspects of the creative industries in terms of the mechanisms of creativity (Potts 2007). This definition involves the merging of concepts such as entrepreneur, artist and, in general, human creative activity. This dimension is well studied in neuroscience, anthropology, history, psychology (cognitive, behavioural and social), sociology, and business studies. Even economists are now becoming interested in this (Gallen 2005, Magee 2005).

**Definition #16** proceeds from the *intellectual property* aspect of definitions #2 and #3, but inverts the logic. Economists (e.g. Boldrin and Levine 2002, 2005, 2008; Romer 2002; Klein *et al* 2002, Lerner and Tirole 2002) have become increasingly noisy in opposition to intellectual property (as have others, e.g. Benkler 2006). The basis of this argument is examined in Montgomery and Potts (2008) and which points toward a definition of the creative industries as: *the set of industries, due to global context, for which IP is a problem to be solved, not a solution to a problem*. The basis of this argument is that creative industries are not only competitive industries (as in Boldrin and Levine 2002) but also global industries, re-use industries, and adaptive industries in respect of business models. While this relates to definition #8, and also to definition #10, it introduces the new aspect of asset value and market creation (i.e. business model).

**Definition #17** is arguably the most contentious but, at least, the most straight-forward: it says simply there is no definition, or more pointedly, that there is *nothing here to define*. This definition views the creative industries as essentially a political movement bent on rent seeking or rent protection. This definition does not include

critics of creative industries (definition #2) who are still supporters of definition #1. It includes only those that reject all above definitions. The standard caricature is the neoclassical, or Treasury, economist. There central argument is, essentially, that nothing is special, and that economic activity is economic activity. While they may allow that there are interesting economic puzzles in particular aspects of creative industries operations, they insist that there is no *a priori* reason to favour these industries with special treatment. In Potts and Cunningham (2008) this is model 2: the 'just another industry' model.

In sum, we have the following definitions of creative industries:

1 Cultural industries
2 DCMS creative industries
3 Copyright industries
4 Creative economy
5 Trident model
6 Creative class
7 Core-periphery model
8 Special economics
9 Service economy
10 Schumpeterian growth
11 Markets & market institutions
12 Social network markets
13 Attention economy
14 Multiple games & identity
15 Creativity, process & identity
16 Intellectual property
17 Nothing interesting

Perhaps there are also other definitions as well.[1,2] Yet even though a good theorist/ methodologist/ statistician could probably elegantly collapse this to a smaller set based on overlapping concepts (e.g. with fuzzy clustering algorithms operating over cross-citation data), the point to note is that, across these definitions, there are some very different and widely non-commensurable definitional issues at work.

These definitional differences turn on major analytic points of focus. For other sciences and domains – such as anthropology, psychology, cultural studies, sociology, history, business studies, economics, complexity theory – to engage with this domain the first thing that is required is a clear definition of what is being engaged with. The problem of course is that that is far from clear and showing no signs of becoming so: instead, as with Potts and Cunningham (2008), Potts, Cunningham, Hartley and Ormerod (2008), Potts (2007a, 2007d), Banks and Potts (2008), and Potts and Montgomery (2008), the issue is becoming more complex, not less.

So, it would seem that a better definition is needed to capture the full dynamic reality of the creative industries and their role in value creation and the growth of knowledge. This is certainly a defensible proposition; indeed, it is perhaps the new mainstream.

However, there is an alternative position, which is perhaps best defined as the inverse of definition #17, namely that there is something there to understand, but that this requires not a specific definition of creative industries but rather a new science. This is **definition #18**: the *cultural science* definition.

# 3 What then is cultural science?

The proposition underlying cultural science is that economic and cultural evolution may be far more similar processes that previously appreciated. This means that cultural and economic analysis may be *homologous* with respect to evolutionary and complexity theory. This leads to the formula: cultural science = cultural studies + economic studies + evolutionary and complexity analysis.

The question remains, however, whether creative industries are an additional element of this definition or an endogenous aspect. Either way, it follows that a unified scientific framework is appropriate as it serves to extract the set of interactions between these domains that *in toto* define cultural science.

Cultural science is defined about questions related to how the economic system interacts with the cultural system, and vice versa; and how economic evolution drives cultural evolution, and vice versa. These are all good questions about which we know relatively little, and of which many smart people – e.g. A Smith, K Marx, A Marshall, J Schumpeter, FA Hayek, K Popper, T Schelling, A Sen, etc, and also R Williams, M Sahlins, P Bordeau, E Jones, R Dawkins, etc – have thought long and hard. Yet into this fray, we might propose a way forward that has eluded others. This is the model of cultural science as based on a synthetic evolutionary complexity definition of the creative industries.

In this view, *Cultural science* is composed of three core analytic elements:

- **Culture** (cultural studies)
- **Economics** (evolutionary/complexity economics, e.g. Beinhocker 2006)
- **Complexity** (complexity theory and analysis)

The creative industries in turn are a conjoint aspect of all three, not a separate analytic element. What these three analytic domains have in common is the study of complex, self-organizing open-system processes centred about the *growth of knowledge*. Complexity is the structure of the growth of knowledge. Culture is an aspect of this process, as is economics. But only some aspects of cultural studies and economics intersect with this definition, namely those aspects associated with open system (complex) processes of novelty generation and the coordination there-of. Cultural science therefore deals with the effect of cultural and economic novelty as the outcome of complex systems processes.

Cultural science is thus an evolutionary science (in the Popperian sense). It is concerned with the dynamics of culture as an open system process. This analytic framework is then supported with dynamic models of media, communications and culture along with dynamic models of the economic system in terms of markets, entrepreneurship and innovation. This framework may or may not require micro foundations or detailed models of agents. It also may or may not extend to well-defined macro implications for the cultural system, or the economic system as a whole. But it does always involve (meso) analysis of complex systems processes.

Cultural science is not the study of individual people making meaning or money, although this micro aspect is certainly part of the story, but rather the study of cultural processes that emerge from the complex interactions of many individual agents. These are meso level phenomenon. In turn, these *cultural processes* (meso trajectories) form the components of the macro cultural system and economic system. Importantly, cultural science does not view the cultural system and the economic system as abstractly distinct separate domains of analysis. Rather, cultural systems and economic systems are different aspects of the same underlying dynamic of the *growth of knowledge* process.

Cultural science therefore seeks to focus on points of *dynamic interaction* between cultural and economic systems in the growth of knowledge process. It does so with evolutionary/complexity-based analysis. Examples include consumer-producer co-creation in open source production and innovation (Quiggin and Potts 2008; Banks and Potts 2008; Potts *et al* 2008a), and social network markets (Potts *et al* 2008b). These involve analysing how cultural and economic behaviours interact to form new complex cultural-economic systems (such as markets and organizations) and also how this works as an open-system 'creative destructive' process as described in terms of 'Schumpeter meets Williams', or more generally in terms of how cultural and economic evolution co-evolve.

Cultural science is, in this view, a new hybrid science that combines elements of several extant sciences and studies to focus directly on a particular domain of analysis, namely the intersection of cultural dynamics and economic dynamics that has previously been only at the margins of mainstream cultural and mainstream economic analysis.

Cultural science is a synthetic science: a hybrid of models. The power of this synthetic focus is that it enables a better understanding of the general dynamic processes that affect almost all domains of inquiry into the human world. By focusing tightly on complex systems dynamics of social networks, this enables a much broader analytic reach across a great span of subject phenomena ranging from Elizabethan proto-journalism to globalized media networks across cultural and economic aspects of behaviour and the emergent systems that result. Cultural science thus provides a dynamic framework for the integration of many previously unrelated dynamic observations and theories.

Cultural science is not the study of culture at the *micro* level. It is not the study of cultural behaviour or of the cultural mind. It is not concerned with why culture matters to people, nor with how it manifests. Yet, nor is it the study of culture at the *macro* aggregate level. It is not the study of the *culturesphere*, the cultural system, or of culture as any form of summation (e.g. Jones 2005, Sen 2006). Rather, cultural science is concerned with the study of culture as a form of knowledge dynamic: as the processes that create and destroy 'culture'. This is a *meso* level analysis (see Potts and Dopfer 2008b).

In my conception of cultural science, then, the model for this comes from *complexity theory* and *evolutionary economic analysis*, both of which deal with open dynamic systems analysis and the study of the origination, adoption and retention of novel ideas. This, of course, does not imply a straight-forward colonization of new subject

area (cultural dynamics and structure) by a new technological power (complexity theory, evolutionary economics). If so, it would not be 'cultural science', but rather 'applications of complexity theory'. Yet that is not cultural science, at least as I envisage it. Instead, both economic and cultural analysis bring distinct models, data, findings, theories and methods that can be processed (involving both exchange, production and innovation) into new models via complexity/ evolutionary theory to seek to exploit the best of both analytic bases. Cultural science is the simultaneous study of cultural and economic dynamics.

In this sense, it is possible that cultural science could be done badly, were it to combine the worst aspects of cultural studies and economics. This might, for example, involve cultural models of economic systems (Marxism) or economic models of cultural systems (behaviourism, utility functions), thus emphasising driving statics subject to transitory dynamics. Yet cultural studies done well is the opposite: namely analysis of driving dynamics over transitory statics. Doing cultural science well therefore involves recognising that analytic domains will range over micro, meso and macro analysis, but that the fruitful common ground (*i.e.* dynamics: *cf.* process and structure) are centred about meso. As Potts and Morrison (2007) and Dopfer and Potts (2008a) argue, *meso dynamics* define economic evolution. It is my central contention in this paper that meso dynamics also define cultural science (and that micro meso macro is the appropriate framework of cultural science, Potts and Dopfer 2008b).

If so, meso dynamics are the proper definition of cultural science (and therefore the proper basis for selection among the 18 creative industries definitions). Cultural science, in other words is not a *micro study* of complex cultural or economic behaviour, nor a *macro study* of complex cultural or economic systems, but a *meso study* of this complexity. There can of course be sharing of micro and macro ideas in cultural science, but these are normally impossible because of the analytic gulfs that separate the different forms of analysis. *Meso dynamics* thus provides a common basis for subsequent development of micro and macro concepts and analysis.

Bridges between micro analysis in cultural studies and economics are not direct, but pass through the station of meso analysis. The same is also true of macro analysis, which also cannot be compared or integrated directly, but only via meso analysis. Complexity and evolutionary theory provides this analytic bridge. It is this analytic system of exchange and production between economics and culture, connected by the meso hub of complexity theory, that I think best defines the domain of cultural science. Cultural science thus aims to explain the dynamics (and thus structure) of this co-evolutionary process (Mathews 2008). It seeks, therefore, to develop integrated micro models of human behaviour and macro models of emergent human systems by drawing on both economic and cultural analysis as processed through, or coordinated by, complex systems theory, which includes evolutionary theory.

# 4 Conclusion

I have sought to address two questions in this paper: (1) What is creative industries?; and (2) What is cultural science? I have argued that the answers are interrelated. The upshot of this paper is the notion that a general analytic framework and subsequently theory of cultural science is an objective worth pursuing. The potential payoff is not

just better economic analysis, better cultural analysis, or new applications of complexity theory, but a new scientific paradigm for the analysis of human behaviour and society. Cultural science emerges from the study of the creative industries. And the creative industries, in turn, emerge from the co-joint study of economics, culture and complexity. This is why definitional debates in the creative industries matter to the definition of cultural science.

A cultural science (*Kulturewissenschaft*) manifesto thus follows in which we may propose a general analytic framework for cultural science as constructed from a generalization of the generic micro meso macro framework proposed by Dopfer and Potts (2008a). This analytic methodology is explained in Potts and Dopfer (2008b) as in Appendix A below. Cultural science is not just the interdisciplinary hybrid of several extant domains (economics, cultural studies, complexity), but rather a new analytic foundation based upon the study of novelty and society, or, in other words, the growth of knowledge.

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## APPENDIX A

# A Cultural Science (*Kulturewissenschaft*) Manifesto

Kurt Dopfer & Jason Potts

## Introduction

The domains of systematic inquiry into cultural phenomena that are addressed by cultural studies, media studies, and the arts and humanities broadly considered are widely appreciated as legitimate domains of intellectual inquiry that are of considerable philosophic interest and practical value. They constitute a core component of the knowledge base of society and are, collectively, one of the pillars of higher education. Yet they are equally understood as *not science*.

The significance of this point is simply that over the past several hundred years, domains of study that *are science* have systematically come to displace and dominate those that are *not science*. The study of cultural phenomena is no exception to this general principle and evolutionary growth of knowledge trajectory. In the past few decades, physical and biological sciences have made increasing inroads into the study of cultural phenomena. This is good, because it is part of the growth of knowledge. But it is also troubling with respect to the potential loss of accumulated bodies of knowledge and fine-grained understanding that are being displaced due to methodological incommensurability and intransitivity. That is what is occurring now.

The question is: what to do about this? The extreme options are: (1) to fight a rear-guard defensive war (as in the post-modernist approach); or (2) to surrender completely. Both of these approaches are common. Yet, a 'third way' is to seek a new kind of cultural science – a *Novum Cultura Scientas* or *Kulturewissenschaft* – that seeks to integrate the methods and models of science, which are its core aspect, with the methods and models of cultural studies, including its detailed empirical investigations and conceptions of individual motivations in the social context. This third way would thus seek to hybridize aspects of both domains into a new *cultural science*. This manifesto seeks to outline the basic principles of such a synthetic approach.

Our central argument is that this must, first of all, be an ontologically, analytically and theoretically an open systems evolutionary approach. And second, that this must be an approach that builds upon the empirical basis of extant cultural knowledge and analytical categories. The construction of a new cultural science thus requires an analytic re-construction from the ground up, as it were, in which analytic frameworks, theories models and empirical formulations are appropriately reconstituted.

First, it is important to be clear about the relation between the building blocks and methodologies of systematic inquiry. As such, we think it useful to begin with a review of the hierarchy of scientific abstractions (see Figure 1 below). In this view, ontological abstractions about the nature of reality are the foundation of all rational or systematic inquiry, scientific or otherwise. Ontological considerations about what exists then determine analytic statements about what matters, and so condition the space of theories and models. All models have theoretical underpinnings, all theories have analytic underpinnings, and all analysis has ontological underpinnings. Ontology determines analysis, analysis determines theory, and theory determines models. Any and all discussion of a cultural science must begin with this hierarchy.

Figure 1. **Hierarchy of Scientific Abstractions**

| Models |
|---|
| Theory |
| Analysis |
| Ontology |

Several issues are involved. First, the importance of recognising that modelling considerations depend upon theory; that theory depends upon analysis; and that analysis depends upon ontology. Second, that this hierarchy of emergent orders of modes of knowledge has direct implications for current practise. One implication is that the gathering of data about the cultural domain is, in itself, scientifically meaningless unless connected to models, theory, analysis and ontology. Observational empiricism in itself is not science unless connected to theoretic and analytic explanations of such phenomena. A corollary implication is that theories without testable implications are not theories at all, but ideological

preconceptions, and thus not science. What is science is not predefined from physical science extensions (i.e. the *naturalistic fallacy* in philosophy), but rather from ontological, analytical and theoretical foundations subject to rigorous epistemic criteria. Cultural science must begin from this foundation.

## Ontology and Analytic Methodology

Modern science is the product of natural philosophy through the hybrid of rationalist (or logico-deductive) and inductive (empiricist) ways of knowing. Science is thus not just a body of (useful) knowledge, but, more importantly, is a method for discovery of new truths. Since Classical times, science has been organized according to empirical domains of inquiry. At the base of this is inquiry into the natural world, constituting the physical sciences. At the next level is inquiry into the world of life, which constitutes the biological sciences. Yet during the 20$^{th}$ century, this distinction has become increasingly blurred (e.g. biochemistry, artificial life), resulting in new classification schema associated with, for example, the sciences of the artificial, information and computation sciences, and the sciences of complexity. Yet in all such schemes, the social sciences and humanities are considered apart, such that they are viewed principally as the study of human life and interaction, and which is further presumed not to be principally governed by the laws governing natural science. Yet this does exclude application of the methods and models of the natural and biological sciences to human and social phenomena. Indeed, this approach – from equilibrium theory in economics to complexity theory in sociology – has been the dominant analytic foundation in social science. What, then, is cultural science?

The central point is that cultural science is not physical or biological science. Physical and biological sciences concern the study of the rules of matter-energy and their emergent forms of organization. Cultural science addresses the study of ideas (or rules) originated by the human mind and adopted and retained (often stabilized as institutions) for human use. Humans are evolved biological organisms and live in a physical world, but this aspect is not the domain of cultural science. Rather, it is what Karl Popper called 'world 3': the domain of human ideas and artefacts that exist because of human creativity, rationality and endeavour. This is the domain of cultural science.

Figure 2. **Ontological Orders**

| Cultural Domain |
|---|
| Biological Domain |
| Physical Domain |

The domain of cultural science may be decomposed into classes of ideas, rules or knowledge. One such distinction is between economic cultural rules (i.e. knowledge relating to economic operations) and non-economic cultural rules. In this sense, economics is a branch of cultural science, not a natural science. The biological foundation of the 'cultural agent' is as a rule-maker and rule-user (Dopfer 2004). This implies that the carrier of cultural evolution is the human mind and its capabilities to originate, adopt and retain ideas as knowledge for operational use. That ideas and knowledge may be embedded in physical form (as artefacts) does not render the cultural domain ultimately physicalist, for it is the human mind that is the carrier of cultural evolution. Further, cultural evolution is not biological evolution, but proceeds on a time scale and via mechanisms emergent to the cultural domain (see Ziman 2001).

This emergent ordering of scientific domains can also be formulated in terms of an emergent hierarchy of what Foster (2005) calls 'orders of complexity' (See appendix A attached). First order complexity is the 'imposed energy' case, which is descriptive of non-adaptive structures or patterns such as Bernard cells, turbulence that facilitate the dissipation of energy. Second order complexity is the case of 'imposed knowledge and acquired energy' in which selection imposed structures of information that permit control over the acquisition of energy. This is the type of complexity in biological life. Third order complexity (acquired knowledge) occurs when the organism interacts with the environment through constructed mental models. This type of complexity emerges in the social and cultural domain. Yet cultural systems are more complex still, as these mental models then interact. Fourth order complexity arises with interacting knowledge, which is the level of complexity of cultural science and economic science. It is for this reason that models of complexity appropriate to physical and biological systems (first and second order complexity, associated with non-linear dynamics and replicator dynamics, for example) may yet be too simple for the study of cultural or economic

complexity. This suggests limits to the extent that models and theories can be analogously transposed between levels (e.g. techniques from statistical physics) on the basis of similarities in patterns of interactions or similarities in statistical distributions of outcomes. In the absence of a general theory to describe when such analogical transfers are viable and when they are not, caution is warranted.

A fundamental issue remains the extent to which knowledge of a lower level can illuminate a higher level. There has been a considerable effort to explain cultural phenomena (e.g. behaviour in markets or other aspects of human interaction, such as trust, aggression, etc) in terms of evolved biological instincts or neuro-anatomy (as in evolutionary psychology and neuroeconomics). This reductionist approach is certainly legitimate, but is ultimately limited to analysis of tendencies and broad preferences and parametric considerations (for example, cognitive processing). Yet it does not address the emergent elements that constitute cultural rules.

In sum, cultural science is not physical or biological science and cannot be reduced to them. Correspondingly, the models and theories that have been successful in these domains may not be appropriate to cultural science. Note this does not exclude the possibility that they might be applicable (for example, equilibrium modelling or replicator equations) but simply emphasises that they need not necessarily be applicable at all. Cultural science will thus require its own ontological foundations. We suggest that this can be conceptualized in terms of an overarching analytic language appropriate to all aspects of cultural analysis.

## Analytic Language

Disciplines and studies cannot communicate with each other in their own languages because they are based about theory and models. To communicate, they require analytic language. We shall propose here a framework of analytic language that may be applied across cultural science. This approach is based about recognising abstract categories and concepts across each. Specifically, this points away from the notion of cultural science as an extension of any one analytic domain: e.g. an economic, historical, statistical physics or a post-modern approach. Instead, we seek to identify general analytic concepts common to all concerns about which theories and models are constructed and with respect to which empirical analysis proceeds.

Clear analytic conceptions help shape an empirical research program. Specifically, they help it avoid the unscientific extremes of data collection without theory (e.g. building endless databases for their own sake, as an empirical fetishism), or of rejection of empirical analysis in favour of a semantic approach to theory construction in which anecdote substitutes for empirical analysis (e.g. postmodernism).

The analytic foundation of cultural science is based about the notion that it is ultimately a study of human knowledge, its creation, stabilization, use, and ultimately its evolution. Unlike the evolutionary epistemology approach (Popper 1972), in which knowledge is treated as subject to evolutionary processes (also memetics), our approach seeks to first generalize the nature of knowledge in terms of what we call the *bimodal ontology* and the *generic-operant* distinction.

The cultural 'world' is made of ideas, or, in analytic language, of rules. Each idea or rule has one or many actualizations, which are the matter-energy forms of the rule in space and time. This is the bimodal ontology, in the sense that the existences of the cultural world are bimodal in ideas and actualizations. This provides us with the rudiments of our first two building blocks: rules and populations. The cultural world is made of ideas (ontological term) – or rules (analytic term) or knowledge (theoretical term) – and each idea (rule or knowledge) has a population of actualizations. Collectively, this defines the *generic* level of analysis. The *operational* level of analysis then concerns the operations of rules with respect to an environment of resources (as in economics), people (as in social science) or meanings (as in the humanities).

| **Domain** | **Ontological term** | **Analytical term** |
|---|---|---|
| operational | | operation |
| generic | actualization | population |
| | idea | rule |

We propose, then, four basic elements or analytic building-blocks for cultural science: Rules; populations; structure; and process. *Rules* are the element of human knowledge that constitutes the cultural domain. All cultural analysis is ultimately analysis of rules in the form of human knowledge. But we also require the concept of *population* to reflect the simple fact that humans exist socially in the sense that the same rules (or ideas or knowledge) can be carried by many agents. This is the population

of the rule. A further implication is that much of the knowledge carried by humans is knowledge about social coordination of shared ideas.

| | |
|---|---|
| rules | because of human knowledge |
| populations | because of social existence and knowledge |
| structure | because of the nature of connected ideas |
| process | because of novelty and change |

Structure and process are equally abstract and equally important building blocks. *Structure* matters because ideas (or rules or knowledge) are connected and derive their nature, significance, value and meaning from the particular structure of associations with other ideas. This is what renders the cultural world a world of (complex) systems. *Process* is a further universal building block because all ideas are created by human minds and thus exist in time as a process. In the individual agent, this is the process of the origination adoption and retention of an idea for use (a micro trajectory). At the level of the system, a process occurs as many agents adopt an idea to the point where the population stabilizes (as an institution, and thus part of the knowledge base). We thus propose that these four concepts furnish an analytic language that is ontologically warranted and analytically sufficient to provide a foundation for the construction of a general framework for cultural science.

## Generic Theory of Cultural Evolution

Dopfer and Potts (2008) have previously proposed this analytic foundation as the basis of a general theory of economic evolution. Yet the aspect that rendered this an economic theory was not its generic foundation (in terms of rules, populations, structure and process), but rather the circumscription of the rules being 'economic rules' which was defined in terms of their operational aspect as rules with respect to operations on resources. As such, a general model of cultural science can be obtained by simply relaxing this constraint, and allowing the framework to include all rules. Thus the general theory of economic evolution is a special case of a general theory of cultural evolution.

The implication, however, is that the same underlying generic analytic and theoretical structure of *micro meso macro* still pertains (see also Dopfer, Foster and Potts 2004). Cultural science should be theoretically organized according to a *static* framework of micro (the individual human and the rules they carry), meso (the rule and its population, as a meso unit), and macro (as the systems of meso units). The static framework deals with the coordination of rules at the micro level, in terms of the coordination of the many rules carried by each individual agent, and at the macro level in terms of the coordination of rule populations. All aspects of cultural statics can be conceptualized within this micro and macro structural framework.

| | |
|---|---|
| macro | Systems of meso |
| meso | The rule and its population of carriers |
| micro | The human agent and the (many) rules carried for operations |

Cultural dynamics in turn is based about a meso process. This begins with the creative or originating act resulting in novelty in the form of a new idea. This is the first phase of a meso process, or *trajectory*. The second phase is the subsequent differential adoption of the rule by other agents. This is the phase of innovation, learning and experimentation. The third phase is the retention and stabilization of the knowledge. This occurs at the micro level through habituation and routinization, and at the macro level through institutionalization. The result of this growth of knowledge process (trajectory) is a new cultural order. This results in structural change at the micro and macro level. Cultural evolution is thus an (historical) massively parallel sequence of such meso trajectories. This process is scale free in space and time.

| | |
|---|---|
| meso 1 | Origination and novelty |
| meso 2 | Adoption and innovation |
| meso 3 | Retention and stabilization |

We thus argue that cultural science is an open systems evolutionary science of the growth of human knowledge. It addresses micro and macro complexity (structure) and dynamic processes (history). It is open in the sense that new ideas drive the system and is evolutionary in the sense that the

growth of knowledge is an evolutionary process. It addresses *cultural statics* in respect of how ideas or knowledge are coordinated and *cultural dynamics* in the sense of the process of how they change. We propose that the generic micro meso macro framework can furnish an analytic framework for cultural science.

**Example: *Verstehen* and the evolution of meaning**

An obvious criticism of this framework is that because it was originally constructed with respect to economic analysis and evolutionary analysis, that it remains an essentially evolutionary economic framework of the growth of knowledge rather than a more general cultural science approach. Specifically, this would render it incapable of analysis of uniquely cultural phenomena such as the production and consumption of 'meaning', in the humanities and cultural studies sense of the social or cultural construction of meaning. Yet consider it thus.

The human mind can understand in both a quantitative and a qualitative sense. It is not a purely rationalistic operation (i.e. a machine), nor is it purely intuitive or instinctual (i.e. an animal consciousness). The extremes of the logical/rational and emotional/intuitive spectrum do not accurately describe human knowledge or understanding. A cultural science approach to the nature of human understanding and meaning does not then seek to locate this in the individual mind in itself (as in psychology or economics), nor in abstract 'macro' notions of society or culture in themselves, but through a micro meso macro conception based about an evolutionary trajectory.

In the beginning is the idea. This is an original creative product of the human mind and enters the cultural space of other minds when an idea has been operationalized to the extent that it can be *communicated* (encoded, signalled, and decoded) to other minds. There are potentially infinite mechanisms by which this may occur. This is the micro aspect.

The meso phase is the process by which that communication process develops such that the idea is adopted and carried by a population of agents. The meaning and understanding of the idea is determined by this process, depending upon which agents adopt in which order and by the uses and experiences to which it is put and the pathways of value created in this process. An idea or rule has no intrinsic meaning in the cultural domain except that to which it is put. It does of course have absolute physical and potentially biological meanings which are independent of this process, but these only condition cultural meaning through indirect feedback effects. These effects may be closely or entirely unrelated to the timescale of the evolution of cultural meaning. Eventually, as the adoption process completes, the meaning of a rule comes to stabilize (as an institution or unit of knowledge) and to attain a locked-in form that may pass into language or artefacts.

At the macro level, this meaning is then coordinated with respect to other meanings (other meso) as a system of understandings. Meaning is thus 'socially constructed' in the sense that it is locked in to the macro system. But this was the result of a meso trajectory (process) through which that meaning evolved. We may then speak of 'culture' as a macro system of evolved *verstehen*, but equally of culture as created by individual creative actions, and of this evolved meaning as a path-dependent process conditional upon historical exigencies, individual interpretations and social refractions.

## Policy

Cultural science should underpin cultural policy. And just as cultural science is understood generally then to include economics, politics, geography, anthropology, humanities etc, so too should cultural policy be understood similarly broadly. By cultural policy we do not mean the domain of public arts, but rather the broad question of the role of public action via the mechanism of government in the cultural world. The extension from the general generic theory of economic evolution to the theory of cultural evolution also applies: namely the cultural (economic) system is self-organizing in its operational dimension and requires no intervention. However, this is not a *laissez faire* model, for the domain of rules is broader than just operational rules, but also extends to the ideas or rules that constitute the cultural order – what Dopfer and Potts (2008) call $0^{th}$ order *constitutional rules* – and also to rules for evolving rules in the sense of knowledge about knowledge – or $2^{nd}$ order *mechanism rules*. These rules are appropriately subject to intervention and design. The domain of cultural policy as based on cultural science should only be concerned with intervention into, or public origination of, constitutional and mechanism rules.

## Research Program

What, then, does this imply for a research program for cultural science? The central point is that the study of culture should be regarded generally, not specifically. The many subfields within should be

understood as aspects of a broader and potentially unified analysis – i.e. a cultural science. The basis for unification is that all are aspects of the growth of knowledge and the evolution of rules as the process-structure building blocks of the cultural order. The sense in which this is special, in for example games media, economics or anthropology, should be of second order consideration to the sense in which all have in common the study of the coordination of structures of knowledge and the process of change in knowledge. The generic micro meso macro framework thus provides a unified analytic language and framework for such integration. A research program of analysis of generic coordination and change would thus follow in terms of:

- Micro structure (coordination of rules in agents)
- Macro structure (coordination of systems of meso)
- Micro trajectories (the process of knowledge in agents)
- Meso trajectories (the process of knowledge in populations)
- Macro trajectories (the process of cultural evolution)

The CCi might then focus on aspects of each of these with respect to considerations of creativity, innovation, technological change, social coordination and the institutions connecting cultural production and consumption with broader political, economic, social considerations.

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## Endnotes

[1] John Hartley (2007: Berlin paper) defines: *Creative Industries as Art* – generates a 'negative' economic model; creativity as a domain of market failure. Art requires subsidy from the rest of the economy. The policy response is a 'welfare' model. This corresponds to 'residual' culture. *Creative Industries as Media and Industry* – generates a 'neutral' economic model. Media and industries require no special policy attention other than 'competition' policy. This corresponds to 'dominant' culture. *Creative Industries as Market and Knowledge/Culture* – generates a 'positive,' or an 'emergent' economic model. Here the creative industries are indeed a special case, the locus for evolutionary growth at the fuzzy boundary between social networks and economic enterprise, where markets play a crucial role in coordinating the adoption and retention of novelty as knowledge (Potts et al 2008). They require 'growth' and 'innovation' policy. This corresponds to 'emergent' culture.

[2] The CCi has while starting with definition #1 has been involved in the intellectual construction of definitions #4 onwards.