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ARTICLE**NEW MEDIA, ART-SCIENCE AND CONTEMPORARY ART:
TOWARDS A HYBRID DISCOURSE?**

Shot By Both Sides: Art-Science And The War Between Science And The Humanities

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Abstract

There is a fundamental philosophical split between the modern culture of science and the postmodern culture of the humanities. This cultural estrangement is, among other things, the underlying cause for the lack of acceptance of art-science and technology-based art in the mainstream art world. However, in the last two decades the study of complexity has introduced a revolution across the sciences. It is suggested here that complexity thinking can be extended to usher in a revolution in the humanities as well. The apparently irreconcilable world views of modernism and postmodernism can be subsumed and unified by a new synthesis called complexism. And artists working on the complexity frontier can serve a key role in helping to bring this about.

Keywords

modernism, postmodernism, complexism, generative art, complexity science

*Entre dos fuegos: el arte-ciencia y la guerra entre ciencia
y humanidades*

Resumen

Existe una división fundamental de orden filosófico entre la cultura moderna de la ciencia y la cultura posmoderna de las humanidades. Este distanciamiento cultural es, entre otras cosas,

la causa subyacente que explica la poca aceptación del arte-ciencia y del arte tecnológico en el mundo del arte mayoritario. No obstante, en las dos últimas décadas, el estudio de la complejidad ha traído consigo una revolución en las ciencias. En este trabajo se postula la viabilidad de ampliar el pensamiento de la complejidad con el fin de iniciar una revolución también en las humanidades. Las cosmovisiones aparentemente irreconciliables del modernismo y del posmodernismo pueden subsumirse y unificarse en una nueva síntesis llamada complejismo, algo a lo que los artistas que trabajan en la frontera de la complejidad pueden contribuir decisivamente.

Palabras clave

modernismo, posmodernismo, complejismo, arte generativo, ciencia de la complejidad

Introduction

Despite the tremendous increase of activity over the years by new media artists, critics, and theoreticians, the art-science community has for the most part been segregated and locked out of the mainstream contemporary art world.

There are a number of potential surface-level reasons why this may have happened. The art world and art market have certain expectations of art; the market virtues of uniqueness, long-term preservation, and potential resale value; for some the purity of individual expression as an emotional outlet; for others aesthetic escape and a hedonic adventure; and yet for others media instrumental in political and social critique. But the art world has embraced dematerialized and ephemeral work before (Lippard *et al.*, 1968), and art-science and new media have much to offer in the way of expression, aesthetics, and commentary (Wilson, 2002).

This short article theorizes that this relative estrangement of new media, and especially that engaged in the art-science realm, is a side effect of much deeper philosophical and worldview conflicts. A detailed analysis cannot be offered in these few pages, and so a useful outline using broad strokes will be attempted here.

The War Between Science and the Humanities

The first popular airing of the growing twentieth century rift between the humanities and science is usually attributed to C. P. Snow's 1959 Rede lecture "The Two Cultures." At least part of Snow's critique seems to be a prescient concern about the twentieth century conflict between modernity in the culture of science, and postmodernity in the culture of the humanities.

Literary intellectuals at one pole – at the other scientists, and as the most representative, the physical scientists. Between the two a gulf of mutual incomprehension – sometimes (particularly among the young) hostility and dislike, but most of all lack of understanding. [...]

The non-scientists have a rooted impression that the scientists are shallowly optimistic, unaware of man's condition. On the other hand, the scientists believe that the literary intellectuals are totally lacking in foresight, peculiarly unconcerned with their brother men, in a deep sense anti-intellectual, anxious to restrict both art and thought to the existential moment. And so on... (Snow, 1993)

Art students are now steeped in postmodern and post-structural thought, though usually without explicit exposure to its derivation and development or the philosophical alternatives. For most young artists, postmodernism has become uninspected received wisdom, more of an inherited culture than a considered position. As a sort of bumper sticker philosophy, the following notions are simply taken as a given:

Science is not objective discovery, it is merely social construction. (after Lyotard)

Language has no fixed meaning. There are only traces, differences, and word games. (after Derrida)

The author is dead, and any meaning is created by the reader. (after Barthes)

There is no truth, merely discourse and (political) power. (after Foucault)

While full of inner complexities and texture, the postmodern culture of the humanities can be starkly contrasted to the modern culture of science (Hicks, 2004).

Philosophically, science is rooted in the values of The Enlightenment and modernity. This includes a metaphysics of naturalism and realism, and an epistemology that trusts both experience and reason as a means to knowledge. Science is indeed a relatively optimistic enterprise in that it posits that real progress and real improvements in understanding are achievable.

The humanities, on the other hand, have adopted a postmodern view that includes skepticism towards totalizing narratives, the simultaneous circulation of contradictory ideas and values, and a

post-structural understanding of language as being unfixed rather than anchored to stable representations.

From the mid-twentieth century on, rather than staying in a modernist mode the art world followed the rest of the humanities towards a postmodern view. Not surprisingly then, when the mainstream art world does address science it generally presents dystopic scenarios, metaphors using words detached from their actual scientific roots, and critiques of economics and social justice in technological society.

Early practitioners of new media have often situated themselves or been contextualized in the dominant postmodern humanities culture. This was, for some, natural because that was the sub-culture they were already in. However, as an early standard text on new media art demonstrates, it often required reinterpretations of science into forms unrecognizable to practicing scientists:

George Landow, in his *Hypertext: the Convergence of Critical Theory and Technology* demonstrates that, in the computer, we have an actual, functional, convergence of technology with critical theory. The computer's very technological structure illustrates the theories of Benjamin, Foucault, and Barthes, all of whom pointed to what Barthes would name "the death of the author." The death happens immaterially and interactively via the computer's operating system. (Lovejoy, 1997)

The modern-postmodern conflict presents what seem to be two directly contradictory and incommensurable world views. The so-called *science wars* of the 1990s, exacerbated by the Sokal hoax and the resultant controversy, raised the stakes to a new high (Sokal, 2000; Sokal *et al.*, 1998).

Since then it seems as if both sides have tired. There is something of a ceasefire. But there has been no reconciliation, let alone unification, of intellectual paradigms. Today those working on the border of art and science find themselves caught in a crossfire of contradictory ideas from opposing world views. Fortunately there is another alternative.

Complexity

The world of science is itself undergoing a significant transformation as it takes on the notions of complexity and emergence. This relatively new (20 to 25 year-old) approach eschews reductionism and embraces a broad view across all scientific sub-disciplines.

When scientists speak of complex systems they do not mean systems that are complicated or perplexing in an informal way. The phrase *complex system* has been adopted as a specific technical term. Complex systems typically have a large number of small parts or agents that interact with similar nearby parts or agents. These local interactions often lead to the system organizing itself without any master control or external agent being "in charge".

In common language one is reminded of the saying that "the whole is greater than the sum of its parts". Examples of complex systems are familiar to everyone. The weather, for example, forms coherent patterns such as thunderstorms, tornados, and hot and cold fronts, yet there is no central mechanism or control that creates such patterns. Weather patterns "emerge" all over and all at once. Such systems are often referred to as being self-organizing.

Other complex systems include the stock market, ant colonies, the brain, the mind, the evolution of species, autocatalytic chemical and biochemical systems, political systems, and social movements. These complex systems often develop in ways that are dramatic, fecund, catastrophic, or so unpredictable as to seem random.

Earlier notions equated complexity with randomness, which is to say that complexity was viewed as being the opposite of order. The new view is that complexity requires a balance of order and disorder. Both crystals and atmospheric gases present emergent properties that are simple, yet the first is made of highly ordered components (atoms in a regular lattice structure) and the second is made of highly disordered components (atoms in random Brownian motion). Complex systems such as biological life require both order to survive and maintain integrity, and disorder to allow degrees of freedom for adaptation, variation, and evolution (Mitchell, 2009).

Complexity and Generative Art

Generative art is arguably the practice on the art-science border that maximizes both scientific understanding and artistic endeavour. The earliest forms of generative art are as old as art itself. They explore highly ordered systems of symmetry and tiling, and examples are found as craft in every known culture. In the twentieth century highly disordered generative systems using randomization came to the fore in the hands of artists such as John Cage and William Burroughs. Both highly ordered and highly disordered forms of generative art can be viewed as simple in the same way that both crystals and atmospheric gases are simple.

Contemporary technology-based generative art explores the same territory as complexity science and is at the apogee of the complexity curve. Generative artists frequently employ complex systems such as evolutionary software, artificial life, and synthetic biology (Galanter, 2003).

Complexity Thinking and Culture

Both modernity and postmodernity commit the same error in their own way. They both seek to explain and understand complexity by reductionist means, yielding simple, but terribly incomplete, systems.

Old science steeped in modernity seeks simplicity by reductionist means resulting in highly ordered systems ill equipped to model nature in its full complexity. Only by embracing bottom-up complexity will science be able to deal with life, evolution, the mind, social systems and the other examples previously mentioned.

The humanities seek the opposite form of simplicity, collapsing hierarchies, promoting the relative, and otherwise reducing complexity to the lowest common denominator of disorder. Many have the visceral feeling that the postmodern humanities have met their own dead-end.

Those on the art-science frontier engaged with the implications of complexity thinking are outside of the postmodern world and so are left unseen by the art world mainstream. Caught between cultures, complexity artists are indeed in a position where they can be shot by both sides. But they are also standing right where a bridge to reunite the culture of science and the culture of the humanities can be built.

Modernism as Thesis, Postmodernism as Antithesis, Complexism as Synthesis

Science is already being transformed by complexity thinking. A complexity-based world view can also be applied to the humanities. The apparently irreconcilable differences between modernity and postmodernity, the cultures of science and the humanities, can be subsumed into a 21st century synthesis of complexism.

The distributed systems in complexity leverage the relative relationships of postmodernity while maintaining the absolute positions of modernity. The notion of *co-evolution* allows for the progress suggested by modernism but in the context of unfixed relationships championed in postmodernism. Chaotic systems preserve the modern notion of determinism while generating the unpredictability celebrated in the postmodern.

Modernism	Postmodernism	Complexism
Absolute	Relative	Distributed
Progress	Circulation	Emergence & Co-evolution
Fixed	Random	Chaotic
Hierarchy	Collapse	Connectionist Networks
Authority	Contention	Feedback
Truth	No Truth	Statistical Truth Known to be Incomplete
The Author	The Reader	The Generative Network
Pro Formalism	Anti Formalism	Form as a Public Process & Not Privilege

Chart 1. Main qualities of Modernism, Postmodernism and Complexism

Consider the competing theories of authorship. In the modern paradigm the heroic author creates the totalizing masterwork. Both the author and the theory of authorship more or less ignore the audience. In the postmodern world the author is dead. All that is left is the instable text, and that text can yield multiple meaning to multiple deconstructing readers.

From the perspective of complexism, texts, authors, and readers are all essential, and in fact all of the active agents are always both authors and readers. The result is complex networks that those studying complexity understand in terms of feedback, chaos theory, and scale-free structures.

In modern art, formalism was a practice executed by the heroic artist. Formalism in postmodern art has withered as the postmodern view denies the artist such privilege. But a new kind of formalism can champion form as a complexity-based, publicly understandable process (Galanter, 2008).

Those on the art-science frontier who embrace complexity inhabit a domain where the culture of science and the culture of the humanities can come together and make discoveries neither could alone. For art-science complexity artists, the question should not be, "How can we get our art into the art world?". The question should be, "How can we bring the art world to where we already are?"

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Philip Galanter is an artist, theorist, curator and an Assistant Professor at Texas A&M University, conducting graduate studios in Generative Art and Physical Computing. Philip creates generative hardware systems, video and sound art installations, digital fine art prints, and light-box transparencies. His work has been shown in the United States, Canada, the Netherlands and Peru.

Philip's research includes the artistic exploration of complex systems, and the development of art theory bridging the cultures of science and the humanities. His writing has appeared in both art and science publications. Recent publications have focused on computational aesthetic evaluation and neuroaesthetics.

As a curator Philip collaborated with Douglas Repetto to create the first ArtBots exhibits in 2002 and 2003, with coverage by CNN, NBC, NPR, the *New York Times*, *Wired*, and *Nature*. He collaborated with Ellen Levy to create COMPLEXITY, the first travelling fine art museum exhibition focused on complex systems and emergence.

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