

Putting Art to the Test

[Robert Pepperell](#)

Published on Axis (<http://www.axisweb.org/dIFULL.aspx?ESSAYID=44>)

Robert Pepperell draws upon his experience of working with a group of neuroscientists to consider the potential for collaborations between art and science. Counter to more common place approaches to viewing and critiquing artwork, within this project Pepperell presented his work to the viewer via an evaluative investigation and considers what both he and his collaborators learnt from this process.

Art vs. Science

I was once struck by a comment overheard in the breakfast queue at a scientific conference on consciousness. A young delegate was propounding his theory of mind to the prominent psychologist Susan Blackmore who, after listening carefully, replied, 'That sounds great, but how can we test it?'¹

As a means of investigating the world the empirical method is simple to the point of brutality: if a theory can't be tested then it's virtually useless, and in order to be tested it must be submitted to an *objective* evaluative procedure, one that is as far as possible free of personal bias, preference, extraneous influence, or error. Moreover, there must be a general consensus in the community about the terms of evaluation, the methodology utilised, the units of measurement, etc. This, it is often claimed, confers a special status on scientific knowledge as compared to other systems of thought that are difficult to measure or less rigorously consensual and so usually regarded as subjective, such as artistic beliefs.

One could make a case that artists test theories as well. They make works of art often with the express intention of evincing a particular premise or body of ideas. These works - with their associated texts - can be publicly scrutinised and the degree to which they manifest their aims can be appraised². But though artistic ideas can to some extent be tested through experiencing the work such evaluations are not generally regarded as objective in the scientific sense. They certainly have no pretension to be free of personal bias, preference, or subjectivity. Subjective experiences, by their very nature, remain opaque to objective scrutiny.

Perhaps in all the recent enthusiasm for art-science interchange and collaboration some fundamental differences between the approaches of the two traditions are too often overlooked. When scientists test phenomena, for instance, they do so within a stringent quantitative framework; in the end science is largely about measurement and the acquisition of data. And collecting data invariably involves an analytic process of dividing reality into measurable units, which can leave the scientific method open to accusations of reductionism.

Artists, on the other hand, tend to resist quantification and eschew reduction. They are prone to confound and complicate, to appeal to the irrational or

ephemeral (as the annual round of titillation induced by the Tate's Turner Prize and its associated press coverage demonstrates). Consequently, artists and critics can be accused of indulging in vacuous and provocative relativism, abandoning any objective criteria of aesthetic judgement. Unlike scientists, artists do not need to agree with each other on the terms of evaluation.

Given these differences, what grounds might there be for a fruitful marriage between science and art? Have recent attempts to encourage a union - for instance by the provision of systematic institutional funding - brought it any closer? In 2005, the science director of the British Council raised serious doubts about the value to either community of the projects funded by the Sciart initiative operated by the Wellcome Trust, saying little good work had resulted³. And it is indeed true that artists often become quasi-scientific illustrators, extrapolating from data to produce more or less interesting images while contributing little to scientific knowledge⁴.

My own experience of art-science collaboration, outlined below, has brought all these difficulties home. Yet, as I hope this article demonstrates, there are possible future avenues of exploration that could secure a genuinely productive partnership.

Visual indeterminacy

I've long been fascinated by a quirk of visual perception that many of us have experienced in which what we see is temporarily detached from what we know - a phenomenon termed 'visual indeterminacy'. It occurs when we see what is in front of us quite clearly, but are unable for whatever reason to reconcile our vision with appropriate semantic knowledge. It can happen when, say, we are looking at a half-torn poster in the underground containing an image that we momentarily can't recognise. Readers may remember a British television show of the 1970s, *Ask The Family*, in which panellists were shown objects from unusual angles that they had to identify. It is a televisual moment that sticks in the mind of many who saw it (fig 1).

As with J. M. W. Turner's 'unfinished' interiors of Petworth House from the mid-1830s, or Braque and Picasso's analytic cubism of around 1910-14, we are presented with enough clues to assure us that there is *something* there to be found but too few to permit clear recognition.

As an artist I've been trying for over 20 years to induce perceptual uncertainty by making images in a variety of media, most recently paintings and drawings, that are in themselves indeterminate (see, for example, fig. 2 & 3). This has spawned a number of associated lines of inquiry about the nature of perception, the boundary between knowledge and reality, the functioning of the conscious mind, and the constitution of aesthetic experience⁵.



Fig 1. Still from the BBC TV quiz series *Ask the Family* in which contestants were asked to identify an object from a close-up or unusual angle (circa 1970).



Fig. 2. Robert Pepperell 'Hera', 2005 Oil on board



Fig. 3. Robert Pepperell 'Impulse', 2006 Oil on canvas

A collaborative study

Through these investigations I have been led to various branches of science that deal in one way or another with the study of how we see and make sense of the world. My intention was to find out what science already understood about visual indeterminacy, and perhaps to benefit from collaborations with scientists whose methods might be useful in expanding my own understanding of the topic.

I was fortunate in making contact with a group of researchers at the Max Planck Institute in Tübingen, Germany, and then at the University of Zurich, who were generous enough to entertain my clumsy and ill-informed speculations about the neurobiological significance of visual indeterminacy. They took seriously the suggestion that my paintings could be used as stimuli in scientific experiments, and Professor Alumit Ishai and Scott Fairhall at the Institute of Neuroradiology in Zurich conducted a series of behavioural studies

in which my indeterminate paintings were compared with historical paintings of similar visual structure (fig. 4) ⁶.



Fig. 4. Sample images from experiment: J. M. W. Turner, 'Vision of Medea', 1828 and Robert Pepperell, 'Medium', 2005.

As an artist I was fascinated to discover whether the informal reports I had received from people looking at my paintings could be more precisely recorded using an experimental methodology. At the back of my mind was the notion that science might even be able to tell me which of my paintings were the most effective at invoking the desired reaction. From the scientists' perspective, there was a hope that this new and untested set of stimuli might generate data that offered insights into the functioning of the human mind.

I quickly realised the kinds of concessions needed to accommodate the practical constraints of the laboratory. First, subjects are presented not with paintings, but with onscreen reproductions - a very different experience from seeing the real thing. Second, in order to quantify the subjects' aesthetic responses to the images it was necessary to impose, what from an artistic point of view was, a rather simple scale of measurement. Initially it was proposed that this would comprise three parameters: ugly, neutral and beautiful. It is quite common in neuroscientific studies to equate aesthetic appreciation with beauty, and to assume beauty and ugliness are opposites ⁷. We were able to agree that aesthetic response is not restricted to beauty alone, as the recent history of art shows, and rated instead how *powerfully* the images affected the subjects⁸. This seemed to be an case in which the knowledge of the artist was to able to combine with the aims of the scientists in order to arrive at a more useful premise than might otherwise have been the case.

Although the strict protocols of the scientific review process prevent me from revealing the results of the experiments until they are published, I can report that a number of interesting findings were made. These included the fact that aesthetics ratings were not dependent of the meaningful content of the images. In other words, my paintings were rated as almost identically powerful as the historical paintings despite the fact mine did not contain recognisable objects, - a finding that may interest those of a formalist persuasion ⁹.

Experimental art

As an artist the experimental process was fruitful inasmuch as it forced me to

see my own work in a harshly objective light, i.e. to see it more like others see it. I also had some concrete evidence that viewers behave differently when faced with my paintings as compared with others. For the scientists there was new data that, in its ultimately published form, may broaden our understanding of those most enigmatic aspects of mind - visual awareness and aesthetic perception.

Altogether the experience has given me confidence that artists and scientists can, with open minds and careful negotiation, find ways of working together that extend both disciplines at the expense of neither, despite the concessions that have to be made. It seems that by combining empirical methods with artistic inquiry one can arrive at hybrid 'experimental art' that may prove a valuable source of new knowledge.

Notes

¹ Thanks to Dr Susan Blackmore for giving permission to report this conversation.

² For example, the paintings of Wassily Kandinsky represent a sustained attempt to give material form to spiritual ideals about which he was quite specific in his texts. However, the degree to which he succeeded in this attempt would be difficult to quantify precisely.

³ Times Higher Educational Supplement, 16th September, 2005.

⁴ Either this or, as James Elkins has pointed out, what many think of as science-art collaborations "...do not link science and art but technology, or popular science, and art."
(<http://webexhibits.org/hockneyoptics/post/elkins2.html>).

⁵ For an account of this work and the philosophical problems involved see: Pepperell, R., 2006, *Seeing Without Objects: Visual Indeterminacy and Art in Leonardo*, Vol. 39:5. The article is available free at <http://www.mitpressjournals.org/toc/leon/39/5>

⁶ For an outline of the experiments and some results see an online poster archived at: <http://eprints.assc.caltech.edu/80/>

⁷ See, for example, Camilo J. Cela-Conde et al., 2004, *Activation of the prefrontal cortex in the human visual aesthetic perception* in Proceedings of the National Academy of Sciences, Vol. 101:16.

⁸ In support of this view one can cite Herbert Read who, in *The Meaning of Art* (London: Pelican, 1951) clearly dissociates art appreciation from beauty: 'Whether we look at the problem historically ... or sociologically ... we find that art has been or often is a thing of no beauty.' (p. 17)

⁹ Although subjects rated all the paintings as having almost identical aesthetic impact, they took significantly longer to reach their decision in the case of my indeterminate paintings. Also, subjects reported seeing familiar objects in more than 20% of my paintings and, despite the similar affective scores to the representational images, they were less remembered in a later surprise memory test. See ⁶.

The study conducted by Ishai and Fairhall was supported by the Swiss National Science Foundation grant 3200B0-105278 and by the Swiss National Center for Competence in Research: Neural Plasticity and Repair.

Robert Pepperell, 2007

Further information:

[More information on Robert Pepperell](#)