Art & Neurophenomenology: Putting the Experience Before the Words

Robin Hawes • Cardiff Metropolitan University, UK • rohawes/at/cardiffmet.ac.uk

> Context • Current theories of art, particularly those developed from a neuroscientific perspective, fail to take adequate account of the role, methods or motivations of the artist. The problem is that the lack of the artist's voice in interdisciplinary theoretical research undermines the basis of current theoretical models. **> Problem** • How can artists purposefully engage with contemporary consciousness studies? The aim of the research was to develop new methodologies appropriate for cross-disciplinary research and to establish what value, if any, neuroaesthetic or phenomenological theories of art could hold for contemporary arts practice. **> Method** • My approach to the topic was to explore the application of neuroaesthetic and phenomenological theory through practice-based research in contemporary art. **> Results** • The paper maps out a proposed avenue of research, and some initial findings, rather than the results of an inquiry. **> Implications** • This paper will be of interest to those who work in philosophy of art and visual perception and those who are exploring empirically-based research methodologies in philosophy. Insights will be beneficial to arts practitioners, philosophers and scientists researching aesthetic experience. **> Constructivist content** • The paper explores Noë's sensorimotor theory of perception and the extended temporal relation between visual elements of an artwork as its forms are created in consciousness.

> Key words • **Visual perception, neuroaesthetics, visual arts practice, consciousness, Alva Noë.**

Introduction

As an artist and designer I have a long-held fascination with the nature of subjective experience and its relationship to the so-called "objective world." Over a number of years, my creative output has been inspired by various descriptions of the human perceptual process, firstly from my introduction to ideas in psychology and later by the increasingly paradoxical and counter-intuitive picture of reality provided from neuroscience. This journey of discovery eventually led me to begin a practice-based PhD studying the relationship between art and visual perception in which the primary theoretical focus has been *neuroaesthetics*.

This research initially involved understanding the terms on which neuroscience appropriates art in its bid to describe the neural basis of visual consciousness. In undertaking my literature review, however, it soon became apparent that this kind of reductionist approach to subjective experience has not gone un-criticized, and a large part of my subsequent study began to draw on the contemporary philosophical challenge to this neuroscientific orthodoxy, as broadly presented from phenomenology.

The aim of my research was to establish what value, if any, neuroaesthetic or phenomenological theories of art could hold for contemporary arts practice, particularly for artists like myself whose primary interest was not so much a desire to *represent* the object world in the work I produced, but to use my creative practice as a means to explore *the nature of perception* itself.

In analyzing contemporary scientific and philosophical theories of art, as part of my study, I have been able to identify two theorists – Semir Zeki and Alva Noë – whose appropriation of art is both explicit, and of sufficient depth, to enable their specific theoretical assertions to be allied to a range of existing artworks.

Subsequently, via initial practice-based research and some further reading of theory, I was also able to identify very particular kinds of visual phenomena that would prove relevant for both theorists and that were of real interest to me as an artist. These are perhaps best described as involving the perception of surfaces or 3-dimensional forms that are not strictly given in the visual array, and over whose contingency neuroscientists and phenomenologists seem to be in clear theoretical dispute.

It is this interdisciplinary terrain, therefore, that provides the location and theoretical background for my current practice-based outcomes. These outcomes are the result of exploring the challenges faced in trying to make works of art that manifest these phenomenal qualities.

In this paper, I will first briefly outline some of the ways in which the neurobiologist Zeki wants to appropriate art in terms of his research into the neural basis of visual perception; the broad criticism leveled at this kind of approach to consciousness as set out by the philosopher Noë; and Noë's alternative appropriation of art in support of his own theories. I will then provide some brief descriptions of how aspects of both these theories of art have impacted the practice-based element of the research so far.

Art and neuroscience

One of the most active protagonists in the dialogue between the visual arts and brain science over the past two decades has been Semir Zeki. As a neurobiologist, Zeki's research approaches visual consciousness as

a phenomenon constituted entirely of neural processes (Zeki 1999a, 1999b, 2009).

His appropriation of art in this context is therefore founded on the notion that the character of an *externally* manifested work of art can better reveal the *internal* processes (the artist's visual consciousness) that were used to create it and that are subsequently responsible for stimulating similar visual responses in the brain of the viewer.

For a neurobiologist such as Zeki, the primary purpose of the visual brain appears to be one of accumulating and storing "knowledge about the external world acquired through the sense of vision" (Zeki 1993: 4) in order that it can subsequently create an internal and subjective facsimile, or representation, of that world in consciousness.

It is in this context, therefore, that the work undertaken by the visual artist can – by intensively testing, probing and investigating the visual world – provide a rich body of evidence with which to reveal the underlying physiological structure and function of the visual brain.

In this way, Zeki has described the artist as a kind of *quasi neurologist*, who investigates the workings of the visual brain as he or she reflects on their subjective experience, subsequently presenting the results of these experiments visually as artworks.

So distinct, for Zeki, are the various physiological aspects of the visual brain that have been unearthed and exploited via the evolution of modern art that he has attempted to define what he has termed the *art of the receptive field*. These include works of art:

> "…whose characteristic components resemble the characteristics of the receptive fields of cells in the visual brain and which can therefore be used to activate such cells." (Zeki 1999a: 89)

A typical example of this is the linear abstractions that characterize the development of the artist Piet Mondrian and their significance for the later discovery of cells in the visual cortex that only respond to lines of a particular orientation. Zeki has written extensively about many different artists and how their work can reveal the *modular* nature of the neural function that, by his assertion, underpins our visual consciousness.

In identifying Cubism as another such example, Zeki quotes the art historian Daniel Henry Kahnwiler, who suggested that Cubism:

> "[…] 'was a sort of analysis,' a static representation of the result of 'moving around an object to seize several successive appearances, which, fused in a single image, reconstitute it in time.'" (Zeki 1999a: 84)

In this way, the Cubists' elimination of both lighting effects and perspective is therefore an approach that neuroscience recognizes in terms of brain function and that seeks to maintain the identity of objects from visual cues regardless of altering perspectives and changing light conditions. It is interesting to note, however, that unlike the alternative theoretical approaches we will come to consider, such examples see art as the *end-product*, the static representation of perceptual processes, whereby the temporal aspects involved in the viewing of the finished work of art are given less significance.

In another example, Zeki cites the creative experiments undertaken by the Fauvists as effectively preempting modern scientific experiments that use color applied to representational and then non-representational objects to evidence the different neural pathways used in each perception. The Fauvists' investing of color in objects that do not usually appear in nature is described as an attempt to "liberate" color from form – to disrupt the natural logic the brain applies to color in the world. In this way, Zeki claims, the Fauvists were unknowingly uncovering and exploiting this particular organizational aspect of the visual brain.

This kind of neuroscientific investigation of brain function relies on a notion commonly referred to as the *neural correlates* of consciousness. This seemingly ubiquitous approach to neuroscientific study is based on the idea that if consciousness is indeed constituted entirely of neural activity, then continued research would eventually be able to map a direct correlation between a specific and objectively evidenced neural state – via fMRI scanning technology – and a subject's reported visual experience of a particular event in the "external world."

However, in researching the contemporary challenge to this exclusively neural description of consciousness, I was able to identify another theorist whose approach also drew significantly on art in support of his alternative theories.

Art and phenomenology

In challenging what he describes as the *brain-centric* orthodoxy, which dominates current approaches to consciousness studies, Noë's *enaction* theory for consciousness (Noë 2004) and his detailed *sensorimotor account of visual perception* (Noë & O'Regan 2002) build upon a rich history of process-based thinking. This history extends from philosophers such as Edmund Husserl and Maurice Merleau-Ponty to later psychologists such as J. J. Gibson and the neuroscientist Francisco J. Varela.

It seemed, therefore, that Noë's theories might well provide a robust modern phenomenological alternative via which I could better evaluate the significance art may have for understanding visual perception and the questions being posed by current neuroaesthetic research.

For Noë, a significant impediment to the study of perceptual consciousness is a dependence on simplistic ideas about what experience is like. For him:

> "When we try to make perceptual experience itself the object of our reflection, we tend to see through it (so to speak) to the objects of experience. We encounter *what* is seen, not the qualities of the seeing itself." (Noë 2000: 124)

Neuroscience's misconstruing of the consciousness problem, for Noë, stems from thinking of our visual experiences as *pictorial* and that when we want to examine or investigate our experience we can in some way turn our gaze *inward* to those pictures.

The problem with thinking in these terms, however, is that this does not adequately describe what our actual visual *experience* is like. Evidence suggests that vision is indistinct beyond our central point of focus, and necessarily partial, multi-layered and indeterminate in its character. Noë therefore bemoans the fact that:

> "[…] vision scientists have long tended to think of their central task as that of trying to determine

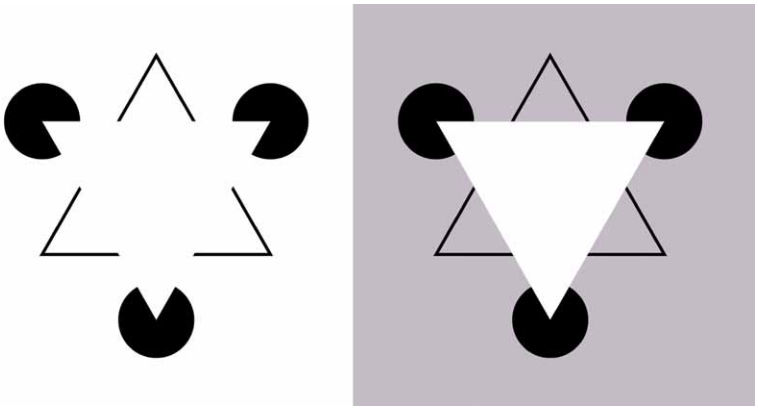


Figure 1: The Kanizsa Triangle (left) and a regular drawn triangle (right).

how the brain gives rise to richly detailed picture-like experiences […] on the basis of the paltry information about the environment projected on to the retina." (Noë 2000:127)

He therefore wants to dismiss this type of *details in the head* model for consciousness because it fundamentally falsifies experience. Rather than constituting internal *images* or *representations*, for Noë our vision constitutes a *process we enact* as we engage with the world, rather like we would in a dance, and is not some internal end-product of neural interactions. For him, if perceptual experience is in fact a temporally extended process, then:

"[…] to investigate experience we need to turn our gaze not inward, but rather to the activity itself in which this temporally extended process consists, to the things we do as we explore the world." (Noë 2000 :128)

For Noë, visual art can provide just this kind of opportunity, and he proposes that many works of art – from the immersive structures of Richard Serra and James Turrell to the paintings of Paul Cézanne and Chuck Close – can be apprehended in this way. The work of these artists, or what he terms *experientialist* art, can therefore help us to clarify certain theoretical problems about consciousness by enabling us to:

"[…] catch ourselves in the act of perceiving and [allowing] us thus to catch hold of the fact that experience is not a passive interior state, but a mode of active engagement with the world." (Noë 2000: 128)

The location for a work of art

After an initial review, I had therefore identified two theorists and two alternative criteria by which works of art were currently being appropriated. For Zeki, this can be defined as the *art of the receptive field*; for Noë, *art that catches us in the act of perception*.

Eventually, with further detailed analysis, it was possible to identify specific terminology used by each theorist that provided a potential overlap, in terms of both the kinds of art each theorist utilized and the kinds of visual phenomena these works had the capacity to manifest. For Zeki, this involves works of art that exhibit the neurological phenomenon of *perceptual completion* (Ffytche & Zeki 1996; Noë, Thompson & Pessoa 1999); for Noë, works of art that help to reveal a phenomenon he terms *perceptual presence* (Noë 2004: 35–73, 2012: 82–113).

By identifying this overlap, I was then able to map a specific location within which I could respond to these theories by undertaking practice-based research.

Perceptual completion versus perceptual presence

Although established independently, these two distinct theoretical terms relate clearly to each other by way of the phenomena used to describe them. To help us unpick these terms and, more importantly, how they relate to aspects of the artworks I am developing in response to these theories, it is useful to turn, as both theorists have, to the Kanizsa Triangle (cf. Figure 1, left).

For Zeki, the Kanizsa Triangle demonstrates the brain's capacity to achieve *perceptual completion*, in this case a perception he describes as amounting to a "superimposed triangle, whiter than the background," which he asserts is "in essential details, identical to a real triangle" (Ffytche & Zeki 1996: 104).

Noë (2004: 69), however, although readily admitting that the illusion is robust – that there is no question that we see contours where, in fact, there are none – asks us to notice that, contrary to Zeki's assertion, there is a striking difference between the experience of a triangle whose boundary is illusory, and one whose boundary is real (cf. Figure 1).

This is a good example of how Noë is able to draw our attention to some of the seemingly *clear cut* descriptions made by neuroscience about our visual perceptions, and typical of the way he urges us to pay greater attention to the actual phenomenology of our experiences.

His argument is that at no point can we be said to actually *see* a completed triangle – either real or illusory. Rather, at best, all our visual system can be said to gather at any one moment is the very limited and partial information projected to the retinas' fovea, that is to say what is present at our actual *point of focus*.

Any *perceptual presence* of a triangle beyond this limited foveal fixation (approximately 1 or 2 degrees of the visual field) is not contingent on an internal *neural picture* that completes the triangle. Rather, its contingency relies on an implicit understanding that a mere flick of the eye can draw again on the external world itself to gather better visual information should our understanding of what is *perceptually present* be lacking in some way.

If this is the case then, I had to ask myself why our visual experience is not more like looking through a telescope at a single point in the visual field, with the majority of our peripheral view absent?

To try and counter this idea, Noë asks us to consider the *actual* periphery of our visual field in our experience, and points to the fact that when we do, we fail to perceive a black void or any kind of boundary (as we would, say, at the edge of a pictorial representation of that visual field). In this way there is an *unboundedness*, a sense in which there is no limit to our visual field. Again, this does not consist of or rely on an *internal neural picture* of that field, but consists in the fact that:

> "we have, and know we have, easy access to what is now further to the right, or left, or up, or down, [and this] unboundedness of the field derives from the unboundedness of our sensorimotor capacities." (Noë 2004: 71)

These contrasting descriptions of how *content* in perception is achieved in this relatively simplistic diagram can therefore extend to far more complex visual stimuli, as manifested in works of art. In this way, Zeki proposes that the potency of many works of art resides in their absences rather than their forms, and cites Michelangelo's unfinished sculptures as a good example (Zeki 2009: 89–97). In these works, the brain is able to *complete* the work and so provide an interpretation unique to the viewer.

Noë would argue, one suspects at least, that such works also serve to *choreograph* the temporally extended and embodied processes that can make such an interpretation possible.

Exploring visual phenomena in contemporary practice

This specific theoretical overlap in the contingencies for visual phenomena – phenomena that are not strictly given in the visual array – therefore provided an initial focus for my *practice-based* research.

My starting point was to begin by working with very simplistic visual data in outline form. By experimenting with different shapes and their relative configuration, I was looking to discover at what point the relation of these simple lines could generate the perception of 3-dimensional forms or virtual surfaces beyond what was strictly given in the drawings – that is, to begin performing much like the visual elements of the Kanizsa Triangle.

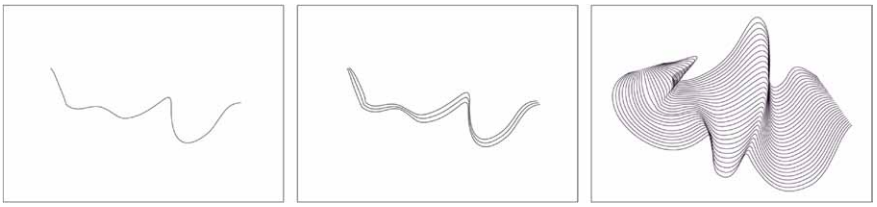


Figure 2: Juxtaposing individual 2-dimensional lines to achieve the perception of a 3-dimensional form and a virtual lateral surface.

Following this initial stage, the task became how best to develop these visual phenomena further to manifest them ultimately as part of more complex new artworks. If I was able to achieve this, then these works could locate themselves within the identified theoretical area and enable me to assess what part these phenomena might play as a valuable or integral aspect of the work of art itself. Was this kind of application of theory valuable or even possible. If so, to

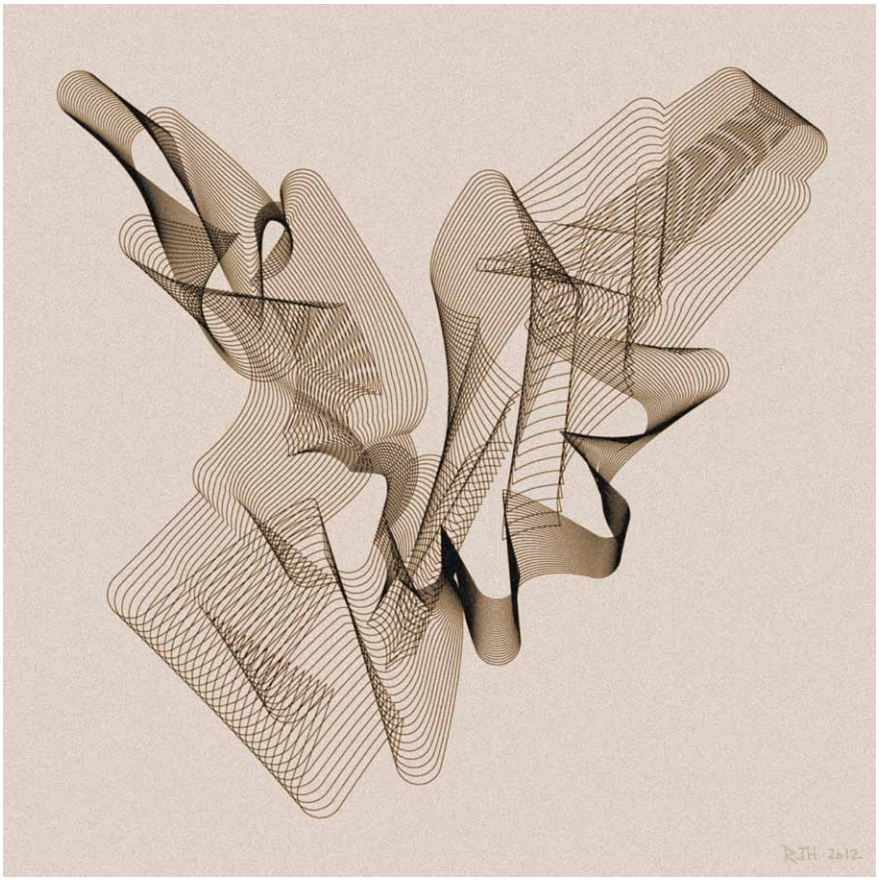


Figure 3: Preparatory drawing for a sculpture, 2012.

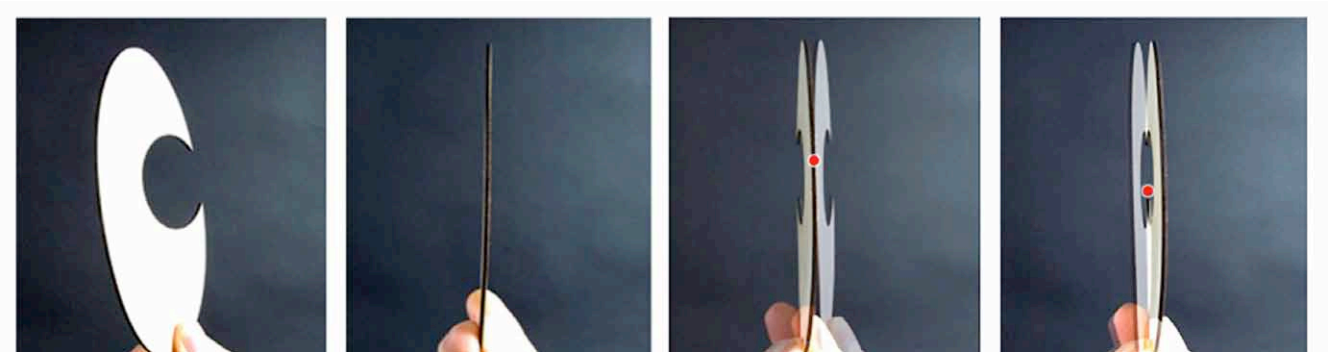


Figure 4: (Left to right) Tile viewed full-face; a monocular edge-on view; a simulation of binocular views (where red dot indicates point of focus) at front edge; at back edge.

what extent could this cross-disciplinary engagement enhance or inhibit the creative process?

It is not possible to detail here the many and various creative experiments that constituted the initial part of the practice-based research. However, suffice to say this initially focused on exploring how one's perception of 3-dimensional form is achieved via a 2-dimensional retinal surface. Part of this involved filming a series of 3-dimensional objects *in the round*, the broad aim of which was to explore how best to generate particular kinds of 2-dimensional profiles – profiles that rendered an object's 3-dimensional aspect or orientation in space as largely ambiguous. These 2-dimensional outlines were then used as my creative building blocks and juxtaposed in different ways, and in different media, in order to understand and experience better at what point a simple 2-dimensional line could once again prompt the visual system into perceiving 3-dimensional form.

As a result of this period of experimentation, I very soon discovered that it is the context and relation *between* the lines, rather than the shape of the lines themselves, via which emerges some perceived sense of 3 dimensions and, occasionally along with it, one's aesthetic appreciation of form (cf. Figure 2).

This *extended temporal relation* between visual elements of an artwork is perhaps less appreciated in the seemingly fixed or static drawings or art objects that characterize visual art than it is, say, in the notes of a musical score or the sequence of movements made by a ballet dancer in more recognizably performative arts. Yet, given this initial experiment, I began to recognize that perhaps the significance of an aesthetic experience lies in *the very nature* of our perceptual process, which can be said to be temporally extended and performative *in itself* and, of course, on which all kinds of art must depend.

This basic methodology therefore became the model for my practice going forward. I would begin by drawing two pairs of lines in order to explore what aesthetic forms could emerge as one line morphed into the other – that is to say, discover how the context and relation of a number of iterative 2-dimensional lines could direct the perception of 3-dimensional form. These designs eventually became more complex, yet were always derived from the starting point of two discrete drawn lines (cf. Figure 3).

Later, as the practice progressed, I decided to begin trying to render these 2-dimensional line drawings into actual 3-dimensional forms.

Both theorists argue about the contingency of the visual phenomena manifested in the art they appropriate. However, I was largely interested in the territory of those that manifest some visual ambiguity. The overriding driver for developing these outcomes therefore remained a consideration of their potential for exhibiting some ambiguity as to a perceived form's orientation in space, or the perception of some outer *surface* generated across and between the iterative forms.

Achieving this of course became much, much harder in 3 dimensions. I later realized this would rely as much on the use of materials and their finish as on the intrinsic shape of the forms produced. What this development of the practice gave me primarily, however, was a critical understanding of the essential part one's *embodied* nature plays in naturally overcoming any visual ambiguity one encounters.

As part of the practice methodology, I took one of the thin tiled slices from these later artworks and examined exactly what my phenomenal experience of it was when viewed *edge-on*. What I discovered intrigued me.

From my previous reading of Noë's theories, I had been convinced his arguments related to embodied aspects of art and visual perception were only relevant when engaging with large 3-dimensional objects – that is to say, works that required some physical navigation. In reflecting on my visual perception of this edge-on profile, however, I realized his theories actually extended to far more subtle aspects of our embodied faculties, including the small movements of our eyes and the binocularity of our vision.

Looking at the tile, I realized the perception of a straight 2-dimensional line, when viewed edge-on, was of course only available to one eye at a time. In actuality, when viewed with two eyes the tile's profile was largely dictated by the movement of my

Figure 5: Permanent Possibilities of Sensation #23. 2012. Stainless steel, walnut. Various views.

eyes' point of focus – in other words, a very subtle but nonetheless *embodied* process of movement.

Even without moving my head or the tile, when I altered my point of focus from the tile's front edge to the back, the form's visual profile changed dramatically (cf. Figure 4).

This period of practice and the investigation of certain visual phenomena therefore resulted in discovering aspects of visual perception I had previously not appreciated. And these intriguing aspects therefore became a catalyst for moving the practice forward in a particular direction.

One of Noë's assertions is that art that lacks perspicuity – that cannot be taken in all in one go – can reveal the actions we undertake to achieve content in perception (Noë 2000). It was this assertion that prompted me to try and develop the sculptures in ways that might counter this natural facility to resolve ambiguities. A typical example of this was a later decision to begin boxing the forms and so restrict certain visual information on offer to the viewer. Later, this also influenced the use of non-reflective or mirrored finishes to control the light-given clues that we unconsciously rely on as we move in relation to an object in order to establish its orientation in space.

As well as manifesting the perception of virtual surfaces or partial forms that might appear or disappear depending on the viewers' movement in relation to an object, I was also able to begin prompting the viewer to notice other characteristics that underpin our perceptions, such as the binocularity of vision.

Just how does the visual brain construct a seemingly singular visual field from the distinctly different perspectival images that fall independently on left and right retina? This, it appeared, was an enduring problem for neuroscience, and again one that seemed to be linked directly to employing a *pictorial* approach to vision.

In response to this puzzle, in one of my finished works – PPoS#23 (cf. Figure 5) – the structure of the object is purposefully arranged so that at a very particular point, about 1 meter in front of the object, all the perpendicular edges of the internal forms can fall together on just one retina and not the other. How does the visual brain combine these two discrepant images, and how does it affect one's visual perception of the forms? This is a question, of course, that can only begin to be addressed by encountering these works *in the flesh* – by experiencing the art directly with both eyes.

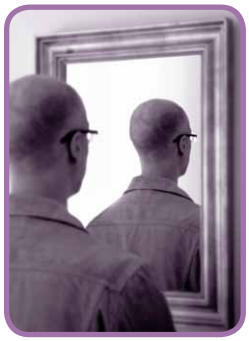
Conclusion

In essence, this practice-based doctoral research aims to explore how the practical application of current theories of art and visual perception might positively or negatively impact a contemporary art's practice, whilst also developing ways in which artists might *purposefully* contribute to this area of consciousness studies.

Art, much like consciousness, is experienced by *the individual* rather than cells or neural networks. Similarly, as a method of exploration it can only consciously be performed at personal rather than sub-personal levels. In this way, and by manifesting the kind of phenomenal experiences theorists need to account for, art may have a special significance for consciousness studies – by *putting the experience before the words*.

Philosophy and the disciplines of science increasingly want to utilize finished works of art in order to theorize these enduring questions of consciousness. Therefore, might there be a valuable contribution to make here for contemporary art, with artists *actively* responding to these theories by making new work?

If so, then the question remains: Is the application of these theories valuable, or even possible, via a contemporary practice; is such a method of any benefit to the art or the artist? Although initial indications are that *embodied* theories of perception seem to hold far more potential for an artist to engage *consciously* with these questions than perhaps exclusively neural theories can, it remains unclear whether exploring these phenomena through art practice is particularly beneficial to the works that are produced. My research so far has provided mixed results, and attempting to bridge the divide between art and science in this way has certainly proved a very tricky path to negotiate in this respect. What *is* clear is that the enduring questions of consciousness and its relation to the human percep-



ROBIN HAWES
is an artist, designer and MA graduate in contemporary visual arts. Currently registered as a PhD research student at Cardiff School of Art & Design, Cardiff Metropolitan University, he is also a research assistant for AIR (Academy for Innovation & Research) at Falmouth University, in Cornwall. Robin's art practice originally developed from an interest in human physiology and how it shapes the nature of our experience, and his academic research is now focused on the relationship between art and visual perception and the value of current neuroaesthetic and phenomenological theories of art for contemporary practice.

tual process nonetheless continue to inspire and drive the creative imagination.

What is it about the curve of a line that makes it more or less aesthetically pleasing? Is it something in the line itself; is it the way in which the line is created; or, in the end perhaps, does it all rely on the ways in which the line is *created in consciousness*? These are the questions that fascinate scientists, philosophers, and artists alike and mark out the territory in which my research continues.

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