Conceptual Art: A Blind Spot for Neuroaesthetics?

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Interest in how the brain and body function during aesthetic experience has increasingly spread to different areas of neuroscience and cognitive research as well as to embodied philosophy, art history, musicology and architectural theory. Neuroaesthetics is a collective term I use here to designate various approaches that involve the study of art from the point of view of perceptual physiology or cognitive science. Neuroaesthetics tends either to emphasize the processes of neuronal groups in the visual cortex when artworks are perceived [1] or to suggest that visual experience depends on a tacit knowledge of how to interact physically with art objects—a proficiency that has a neurological basis in the sensorimotor areas of the brain [2].

Neuroscientist Semir Zeki claims that our perception of art has a biological substrate, a dense network of neuronal cells, feature detectors that process line, color and motion. Zeki’s theories on art are based on experiments from localized perceptual sites in the brain that are also engaged in abstracting processes. They fail, nevertheless, to explain complex concepts such as ideals and beauty. Zeki himself admits, “I have been vague about the precise neurological way through which ideals are constructed by the brain” [3]. Surveying Western art, Margaret Livingstone, a neurobiologist, also analyzes perceptual feature detectors. She studies facial recognition and luminance as well [4]. Others emphasize homeostatic neural mechanisms of arousal and emotional regard involved in responses to art rooted in our evolutionary development. There is a sizable amount of literature that engages critically with these approaches [5].

Alva Nōe, a philosopher, proposes that consciousness is not something in our heads but is something that we do. Seeing becomes a way of acting in the world. Moving around and among objects, spaces and artworks is a process of active perception that helps to create concepts. With embodied concepts, neural pathways connecting sensorimotor areas process actions and thoughts associated with “back,” “forward,” “up,” “down” or “through,” which also form the basis of concepts, suggesting a mimetic relation between conceptual schema and motor orientation. Concepts are acted out using our sensorimotor knowledge [6]. There have been a number of objections that this approach privileges sensorimotor areas of the brain and the role of mirror neurons [7]. According to Clark [8], this approach tends to minimize the role of recall, reason and the imagination (which are not associated with the sensorimotor system), variables that are important for the kind of conceptual thought that supports parody or irony, for example. We can employ prepositions (up, down, through) figuratively, or we may even parody them; such mental operations are based on broader activity in the brain [9].

It is not my intention here to dwell on objections to these approaches but merely to point out that neuroaesthetics as a whole predominantly looks to the formal and perceptible qualities found in traditional and modernist examples of art from Michelangelo to Mondrian, whereas conceptual art, which tends to downplay such qualities, is consistently omitted in these studies [10].

Instead, it is my intention to foreground what neuroaesthetics might consider addressing at some later date: namely, the kind of conceptual thought involved in conceptual art that has formed the paradigm upon which contemporary art practice continues to evolve. It is my hope that a consideration of such art will encourage neuroaesthetics to take into account larger-scale neural events such as concepts and their relation to the study of localized microstructures favored by neuroscientific approaches. Putting neuroaesthetics into this wider cognitive context, which conceptual art clearly demands, may help us to understand our varied and nuanced experiences of art.

Conceptual art is a loose historical term that refers to the works of artists, musicians, filmmakers and writers in the 1960s and 1970s that often, directly or indirectly, reference Duchamp’s work. Themes identified with conceptual art are found before and after this period. We see them in Dada, Pop, Neo-Dada and postmodernism and in many different cultures. At the risk of simplifying, conceptual art brings together non-art objects (“readymades”) and concepts that appear to have no author, purpose or artistic process by which to distinguish them. Its themes challenge traditional notions of beauty and formal design, artistic dexterity, aesthetic composition and technique. In short, conceptual artists devalue the qualities that neuroaesthetics find so important. One might object that these examples are “anti-art.” Yet they are celebrated as art in the history books and galleries and are considered as such by artists and philosophers [11].
This essay looks at four main areas of conceptual art, in an approach that outlines opportunities for research for cognitive science and neuroaesthetics:

1. Some argue that conceptual art stimulates us because it is witty and puzzling, like a word game. From this perspective, art’s aesthetic content can be compared to the elegance of a mathematical proof [12].

2. Some of us find it refreshing that conceptual art questions the traditional importance placed on the visible qualities of art. With conceptual art our perceptions of shape and form are less important than the parody of them. Thus, a recurrent theme in conceptual art is the interplay between the “visible and invisible” aspects of art.

3. Conceptual artworks reference other works: The viewer is invited to enjoy constructing conceptual relations between artworks (I call this intertextuality) using short- and long-term memory, which have a bearing on how we perceive the work at hand.

4. Often related to this intertextuality is a tendency in conceptual art to stimulate the reordering of “conceptual complexity,” often into larger conceptual wholes or superordinate categories, which, in turn, help us to see art in unaccustomed ways.

Puzzle

Joseph Kosuth’s Art as Idea as Idea (1967) (Fig. 1) invites a perceptual examination of the shapes of the letters in the work as “art” yet also allows us to override this basic response by encouraging us to reflect on the nature of vision and art.

There are many works of art that use puns and word games to present the viewer with visual paradoxes. One of the earliest examples is Magritte’s Treachery of Images (Ceci n’est pas une pipe, 1928–1929), which, according to Zeki, “goes against everything the brain has seen, learnt and stored in its memory” [13].

Yet this “going against” is pleasurable and conceptually interesting. In Kosuth’s image, we alternate reading a text with seeing an image. We also read the words “human skill” and “execution” in the text presented. These concepts are extended by Kosuth to include “quoting” and recontextualizing words, actions that he wants us to consider as also indicative of art. The artwork adopts a mutually reinforcing strategy that suggests a reading between the lines and its visual equivalent. It is an understanding beyond optical sensation.

The process of viewing art by Seurat or Mondrian, the works of whom take a thematic approach to perceptual experience, is more easily traced to the action of neuronal feature detectors in early stages of perception in the visual cortex. With conceptual art, these processes are less important than mechanisms of memory, rational induction, planning, semantic and linguistic processing and categorization. Just as brain areas are associated with these functions, pleasure might be associated with solving puzzles found in conceptual art, which would involve stimulating emotions as well as linguistic processing. Thus, without going into too much detail, conceptual thought is produced from a cooperation of many brain areas together [14]. This cooperation can produce marks: “interpretations that the viewer may integrate into larger conceptual wholes not easily traced to one particular area of the brain, let alone particular groups of neuronal firings. Conceptual art seems to require this “molar” conceptual integration. Zeki characterizes such multiple interpretations as “ambiguity,” based on a three-tier system:

Ambiguity may be due to activity in a single area in which the micro-conscious correlate of activity may be in more than one state. Obviously, there is no “top-down” influence here. At a higher level, the ambiguity may involve more than one area, as in the Rubin vase. This may or may not involve higher areas in the frontal lobe. At a higher level still, the ambiguous state may involve several distinct areas that are able to bring their influence. . . . Here, memory, experience, learning and much else besides can influence what is perceived at any given moment. This almost certainly involves a “top-down” influence, from diverse sources, not just the frontal lobes. Thus, opening up the capacity for a given brain area to be influenced by another area is merely one step in opening up the capacity to be influenced by multiple other areas [15].

This third area, involving “higher-level” processing, is where “top-down” influence on perceptual organization is strongest. This area, which is most often functional in our experience of concepts and semantic processing in conceptual art, is largely ignored by neuroaesthetics. In other words, conceptual art reveals a
new set of problems, issues and opportu-
nities for understanding the relationship 
between art and neuroscience.

THE VISIBLe AND 
THE INVI SIbLe

How this important interplay of themes 
requires a cooperation of several brain 
areas can be seen in Duchamp’s much-
written-about *Bride Stripped Bare by Her 
Bachelors, Even* (known as the *Large 
Glass*) (1915–1924). This elegant and enigmatic 
work is made of twisted metal wire and 
flattened metal plates cut into suggest-
ive shapes mimicking machine forms, 
all pressed between two sheets of glass 
that are held up by a metal frame. It is 
thus freestanding, so that one can walk 
around the work, see through it and look 
into it. According to the artist’s notes, it 
is divided into a female area above, sug-
gest ing a heavenly presence, in opposi-
tion to the gravitational pull of machine 
parts, chocolate grinder, filters and scis-
sors below. The work has sometimes been 
interpreted as a metaphor for sex; yet the 
piston mechanism, which is supposed to 
connect the sections above with that be-
low, fails to make contact and suggests 
instead unfulfilled desire.

A richer involvement with the *Large 
Glass* is achieved by using at least two ways 
of seeing: (1) the processing of percep-
tible qualities using feature detectors or 
sensorimotor mechanisms, in addition 
to (2) drawing upon areas of the brain 
responsible for semantic processing and 
rational induction. The *Large Glass* is 
more than a neurological stimulation of 
sensorimotor movements. Despite its 
exciting (yet ironic) system of illusion-
ism based on geometries in perspective, 
it also involves a distancing from the op-
tical “point of view” when we begin to 
create concepts using a series of poetic 
associations linked to notions of trans-
parency and light “shining through” the 
sensible properties of the work.

The transparency of the glass engages 
different ways of seeing. We can think 
about the flatness of the work and the 
formal features of the machine parts, yet 
the glass invites us to see beyond them, 
thereby suspending our awareness of the 
perceptible elements of the work, as we 
would see beyond the shapes of letters on 
a page while trying to understand their 
meaning. While the machine parts tell 
us a story of a reproductive cycle that 
misfires, looking through the transpar-
ent glass, one is reminded of St. Thomas 
Aquinas’s description of the Immaculate 
Conception as a ray of light that passes 
through a glass, leaving the glass (and 
the Virgin’s body) intact. The light shines 
through the glass as we gaze through it; 
we “read through” objects (and our sense 
perceptions of them).

While it is possible to interpret Du-
champ’s machinism in a visceral sense as 
a representation of sensorimotor move-
ments in the sex act, it is also possible 
to view it within a tradition depicting 
technology as a model for processes of 
thought. Hobbes and Leibniz used mechani-
canisms in this way. Freud used ther-
odynamics as a way to articulate psycho-
logical processes, and cognitive science 
sometimes uses the computer as a model 
for the brain [16]. Seen in this tradition, 
Duchamp’s system of machine parts in 
the *Large Glass* may only literally refer-
ence sex. It is also possible to see it as a 
body: The top part is the mind, the choc-
olate grinder below suggesting the sex-
ual organs. The work invites a continual 
shift between different representational 
systems: the careful perspective in which 
the bachelors are placed below and the 
parody of the window; the suggestion of 
psychological sex drives; the mechanics 
of industrial machine forms; the absence 
of freedom suggested by automata; the 
automatism of biological reproduction; 
the theological implications of the light 
and the glass and predeterminism; and 
perhaps above all a life-affirming and 
endlessly complex relation of concepts. 
Each conceptual system is an interpretive 
framework we can engage with at any mo-
ment while we are visually inspecting the 
work with perceptual processes that we 
need not employ thematically.

Duchamp’s *Large Glass* remains one of 
the most widely discussed works of art. Its 
visual allure encourages both conceptual 
complexity and self-reflection. However, 
it is placed into an even more fascinating 
conceptual context in *La Boîte-en-valise* 
(“box in a suitcase”) (Fig. 2), a suitcase 
containing a box of hand-tinted prints 
and miniature artifacts that catalogue 
Duchamp’s oeuvre. The artist worked on 
over 300 editions of this valise from 1935 
to 1941. In many of them, his *Fountain* 
(1917) was reproduced in miniature, as 
it to readmit it into another “gallery” con-
text in the valise, often called a portable 
museum.

Each artwork similarly gains new sig-
ificance by being recontextualized and 
juxtaposed with other works. The valise 
is a visual mnemonic system as well as a 
form of conceptual exploration. Each art-
work, the *Large Glass* prominent among 
them, is a token of a distinct concept; 
they can be viewed in any order—from 
right to left or vice versa, or from top to 
bottom. We can combine the objects in 
Duchamp’s box, put them in different se-
quences and use them as touchstones for 
concepts in relation to others. The box 
also invites us to imagine using it with our 
bodies as well as our minds; as a suitcase, 
it invites us to pack and unpack objects as 
we might when planning a trip or orga-
izing a stay. It uses localized perceptual 
processes, sensorimotor involvement and 
the processes of memory and conceptual 
planning ahead. This experience, requir-
ing multiple levels of explanation, thus 
engages dynamically with many brain 
areas.

Reinforcing the themes of visibility 
and invisibility in the valise is an image 
of *L.H.O.O.Q. Shaved*. The “original” 
*L.H.O.O.Q. Shaved* was a print of Leonardo’s 
*Mona Lisa* on which Duchamp had 
painted a moustache and goatee. In 
*L.H.O.O.Q. Shaved*, the moustache and 
goatee are omitted. The work plays with 
notions of absence and presence and the 
continually deferred “original” in the 
context of a box of simulacra. The 
work encourages us to question our per-
ceptual responses and notes the ordi-
narily obvious: It is a print of the *Mona 
Lisa*, but we cannot help but imagine it 
as Duchamp had defaced it years before; 
we “see” the absence of the moustache. 
Much has been written on the enigmatic 
beauty of the *Mona Lisa*’s smile, more 
recently from a neurobiological point of 
view [17]. Yet with *L.H.O.O.Q. Shaved*, this 
perceptual or pleasurable response, al-
though still available to us, is questioned 
as we turn our attention to Duchamp’s 
act of defamiliarizing a well-known face 
and questioning habitual ways of experi-
encing beauty.

INTERTEXTUALITY

Duchamp’s well-known intention to “leave retinal art behind” is clearly dem-
onstrated in the valise, which is a micro-
cosm of the intertextuality principle. 
Histories of contemporary or conceptual 
art often begin with Duchamp’s *Fountain*, 
a urinal turned on its side, now part of the 
art world, which challenges the “retinal” 
appreciation of formal categories. Also 
included in the box is *50 cc Air de Paris* 
(1919) (an empty glass ampoule—as a 
joke, containing “Parisian air”—that the 
artist took with him when he migrated 
to America).

The artists who have referenced Du-
champ’s examples are too numerous to 
mention here. One work in the spirit of 
Duchamp’s non-retinal principle is Hans 
Another is Piero Manzoni’s *Artist’s Breath* 
(1960), where the artist personalized Du-
champ’s gesture of *Air de Paris* by breathing into a red balloon on a plinth. Also of note is Robert Barry’s *Inert Gas, Helium* (1969). Examples from more contemporary art include Martin Creed’s *Light Going On and Off* (2000), a room in the Tate Modern, London, where a light went on and off every 5 seconds. Creed won the 2001 Turner Prize for this exertion. The work “blinks” between appearance and disappearance, art and reality. However, the blinking also references the viewer’s gaze and the fact that she also can make reality or art “disappear.” This is a play on the binary of visibility and invisibility, the former showing us emptiness in a gallery, the latter repeating emptiness in a different light and “reproducing it.” Art is “dematerialized,” but the concept remains and can be staged in any gallery anywhere in the world or in any number of galleries at the same time.

Our experiences of all these examples of conceptual art are not explained by neurobiological experiments that look at perceptible properties of the artworks, yet such experience generates a whole field of intellectual analysis, artistic innovation and controversy over value and meaning in the arts.

Many conceptual works of art reference other artworks in a semantic network not readily reduced to neurological explanation. This system of associations helps us to create new concepts by recombining stored ones in novel relationships using both our rational and imaginative capabilities.

## Conceptual Complexity

It may be tempting to presume that concepts are merely stored in the brain and that we recognize them in the artwork through perceptual cues. In other words, the organizational work of comparing and contrasting conceptual works in meaningful sequences is all generated from higher-order processes cut off from the world. However, some concepts, whose tokens may be found in the external world, not only help to reconfigure or re-sequence our stored concepts but also affect our eye movements and attention [18].

While phenomenology and enactivism challenge the traditional mind/body duality by asserting that embodied involvement with the world is comparable to cognition, recent developments in “situated cognition” suggest a complex interaction between stored concepts and material anchors in the external world, involving “loops and circuits that run outside the head and through the local environment” [19]. Integrating brain, body and world rather than promoting any one of these factors over the other, as do neuroaesthetics (brain) and enac-
tinism (body), is likely to provide a more balanced and comprehensive explanation of how we experience art.

With Duchamp’s valise, we can argue that the work itself provides the viewer with a series of cues or guidelines for forming conceptual relations, rather than a situation in which fixed concepts stored in the brain are simply recognized in the art object. Edwin Hutchins [20] argues that a material object can anchor conceptual relationships in such a way that we can shift the sequence of perceptual cues to create new meanings, concepts and categories. A well-known linguistic principle is that changing the syntax of units of meaning creates new meaning; in the process of changing conceptual sequences, new concepts arise [21,22].

The valise is a repository of tokens referencing Duchamp’s longstanding devotion to the concept of non-retinal art. This organizing concept helps to guide us, in a top-down fashion, through our perceptual inspection of the valise. If we imagine that the box is a traveling exhibition of non-retinal art, an “archive of invisibles,” we would see reproduced in the box, along with L.H.O.O.Q Shaved and the glass ampoule referring to 50 ce ain de Paris, an image of the famous bottle rack readymade, upon which we can imagine wine bottles hung out to dry. There is also the Traveler’s Folding Item (1916), a reduced version of an Underwood typewriter cover suggesting a typewriter underneath, a tool that can be used to write a letter or poem. Although the typewriter as a symbol of creativity has been “put away,” the conceptual work continues beyond the manual or mechanical execution of ideas. Also included in the box is the fluttering love-heart print, a famous diagram used in perceptual experiments. Duchamp used it to alert us to the theme of the retinal and non-retinal in art. The image of his famous Nude Descending a Staircase is a conceptual depiction of motion in a fixed medium: Do we see the figure or the motion? In such cases, we are no longer seeing perceptually. As a whole, the valise helps to activate an intensity of conceptual production through a continuous parody of visual codes. We are able to see each individual object not in the customary perceptual way using feature detectors or sensorimotor capabilities but as part of a jigsaw puzzle that uses other brain areas—the memory, rational induction, linguistic processing and the imagination—in order to produce a conceptual way of seeing. This way of seeing is structured as a network of relations characteristic of many kinds of art.

Arthur C. Danto [23] suggests that much of art is, in fact, conceptual, as it invites an “enthymematic” phenomenon whereby the viewer is responsible for supplying the “missing” conceptual link, which the work itself suggests [24]. Duchamp claimed, “What art is in reality is this missing link, not the links which exist. It’s not what you see that is art, art is the gap” [25]. The concept or superordinate category that Duchamp's valise helps us to construct is “non-retinal art,” which primes our attention and guides our perceptual searching [26]. The objects in the box help us to “pack” new examples into our superordinate category of non-retinal art, and they can be used as loci for complex conceptual combinations. They do not provide a fixed map or coding of concepts, as it is possible to make different linkages between them and to reorder them, as we might change the syntax of a sentence in order to adjust its meaning. Like many composite artworks, the box presents the opportunity for the mental manipulation of concepts within the situational constraints provided by the artist.

The box requires that we use many different brain areas: the feature detectors of the visual cortex, the action areas of the sensorimotor system studied by neuroaesthetics and cognitive science, as well as memory, language and rational induction employed by other areas studied by these disciplines, along with cognitive psychology and philosophy.

To privilege only one of these aspects massively reduces the multidimensional meaning and experience the valise affords.

The valise may seem an exception among art objects, given its complexity. I would argue that this is not the case. One need only consider that many artists collect a number of their own artworks into one exhibition and achieve a similar conceptual multiplicity. Artists commonly think in groups of works, using analogical thought, rather than simply focusing on isolated works. Art historians, too, are trained to think in terms of networks of relationships among artworks, helping to uncover an intertextual system of references.

The Large Glass enriches and is enriched by the company it keeps in the valise. The discoveries of neuroaesthetics need to be balanced by cognitive, psychological and other approaches; neuroaesthetics too, can be enriched by the company it keeps. Providing such a context for the perceptual data of neuroaesthetics helps us to come closer to understanding the massive neural, embodied, conceptual and social integration that art entails.

References and Notes

Unedited references as provided by the author.


3. Zeki [1] p. 74. Zeki conceives that the concepts used as standards by which to judge art are “difficult to study at the level of brain cells; we just do not have the technology at present . . . we therefore have to limit ourselves to generalities and to hints” (p. 53) and “where the concept itself resides is problematic” (p. 54).

4. Livingstone [1].

5. “Art and the Brain,” Special Issue, Journal of Consciousness Studies, 6, No. 6–7 (1999); “Art and the Brain II,” Special Issue, Journal of Consciousness Studies, 7, No. 8–9 (2000) and “Art and the Brain III,” Journal of Consciousness Studies, 11, No. 3–4, (2004); in an essay entitled “Art and Reductionism” in the latter volume (pp. 111–116), Eric Harth writes, “almost any macroscopic physical event that involves the intervention by a human brain cannot be fully understood by just following the chain of cause and effect beginning with elementary neuronal events” (p. 114). Citing Livingstone, Irving Massey, in The Neural Imagination (Austin: University of Texas, 2009) observes the tendency to analyze episodes of vision as perfect laboratory models ignoring the differences in subjective experiences or attention spans (p. 137). Raymond Tallis, Professor Emeritus of Geriatric Medicine at the University of Manchester, questions whether “love” can be traced to “bits of brains” as Zeki proposes, when even “sophisticated neural imaging . . . cannot distinguish between physical pain and the pain of social rejection: they seem to ‘light up’ the same areas.” The fallacy of fMRI scan studies is that “the areas that light up are regarded as ‘the center’ for that experience, emotion, or propensity.” Times Literary Supplement Online, April 9, 2008. <http://entertainment.timesonline.co.uk/tol/arts_and_entertainment/the_tls/article3712980.ece> 30 June 2011.


8. Clark [7]: 516.

9. Single or group cell experiments need to be put into a broader, dynamic context because “no cortical area operates in isolation but is connected to many other areas by anatomical long-range connections (‘association fibers’). The upshot is that behavior of a particular [brain] area cannot be predicted and explained from local microstructure alone.” F. Egan and R. Matthews, “Doing cognitive neuroscience: A third wave,” Synthese, 153: 385 (2006).

10. In Inan Vision (London: OUP, 1999), Zeki suggests that Duchamp’s work is not “universally appealing.” This caveat reveals Zeki’s bias for traditional art, as popularly defined (p. 146).


14. For an attempt to ground concepts in sensorimotor areas see Lawrence, “Abstraction in perceptual
symbol systems," *Philosophical Transactions of the Royal Society of London: Biological Sciences*, 358, 1177–1187 (2003). Yet conceptual knowledge may also be stored or organized amodally in temporal and prefrontal areas.


21. In semantic theory the “meaning of a concept is given by its role within its containing system.” Robert Goldstone, et al., “Connecting concepts to the world and each other,” in D. Pecher and R. Zwaan (Eds.) *Grounding Cognition* (Cambridge: Cambridge University Press), 286. This suggests that the context provides meaning, not the individual lexical units, concepts or metaphors themselves.
26. The prefrontal cortex is said to provide abstract rules for organizing categories.

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