

How can visual experience be depicted? A study of close-up double vision

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Abstract

The attempt to record visual experience has been of central importance to many artists throughout the history of art. Vision itself is made up of many processes, both psychological and physiological, and is still only partially understood. This paper presents research into an aspect of visual experience described as ‘close-up double vision’, which has been directly informed by the artwork of the Swansea born artist Evan Walters. Close-up double vision occurs when an object is seen extremely close to a viewer whose eyes are not both fused on the object concerned, creating a doubling effect in the visual field. Walters termed this doubling effect caused by lack of binocular fusion ‘double vision’ and spent much of the latter part of his career trying to record it. This paper briefly introduces Walters’ experiments in double vision and outlines current research that attempts to record this aspect of visual experience in artworks.

Keywords

Close-up double vision, depiction, double vision, Evan Walters, visual experience

Introduction

Many artists have been concerned with the practical problem of how to depict the experience of visual perception. From the earliest surviving Paleolithic cave art through the development of one-point linear perspective during the European Renaissance to the invention of the camera and modern photography, the way we represent visual experience has evolved through many phases (Dunning,

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1991; Edgerton Jr, 1975; Lewis-Williams, 2004; Panofsky, 1993[1927]) and continues to engage many contemporary artists (Gayford, 2011; Hockney, 2001; Weschler, 1982; Weschler, 2008).

The nature of vision itself is a vast and complex field, with many competing and conflicting approaches being taken by the numerous disciplines that study it. What is clear from recent research, however, is that vision is not a passive process through which we simply absorb and recognize sensory data from the world. Rather it is a highly dynamic and active process that involves many areas of memory and cognition – a fact that artists have often intuitively grasped. While discussing the artwork of David Hockney, the art critic Lawrence Weschler wrote,

vision as it is lived involves a stereoscopic vantage in continual motion, with the perceiving mind actively engaged in retrieving memory, projecting expectation, computing relative scales, compensating for seeming discrepancies, and so forth. (Weschler, 2008: 181)

This paper will focus on one aspect of visual experience, what Weschler above refers to as a ‘stereoscopic vantage’, which results from the binocular arrangement of the eyes. In doing so, we will discuss the artwork of Evan Walters, an artist who explicitly tried to capture the effects that occur from seeing with two eyes. Walters was intrigued by the phenomenon of ‘double vision’ or ‘diplopia’, which results from uncrossed and crossed disparity. The cause of uncrossed and crossed disparity will be described below. Subsequent research undertaken by the authors into how such visual effects, particularly what we refer to as ‘close-up double vision’ can be best represented, will also be discussed.

Double vision and close-up double vision

Double vision is known in clinical terms as ‘diplopia’, and occurs when a viewer’s eyes are not converged on an object (Palmer, 1999: 209; Shapiro, 2011: 20; Wade and Swanston, 2013: 195–207). For an object to appear in single focused vision it must fall within what is known as ‘Panum’s Fusional Area’ (see Figure 1), which is the area where the lines of sight of the viewer’s eyes converge, about three feet away, on the Horopter (Bloomer, 1990: 107). From here, the slightly different images projected onto each retina from the object can be fused by the brain into a single image seen in depth (Palmer, 1999: 209; Wade and Swanston, 2013: 195). Objects seen beyond Panum’s fusional area appear doubled in either uncrossed or crossed disparity, depending on their distance from the viewer (Walters, 1940: 40). In this paper we refer to uncrossed disparity as double vision, and crossed disparity as close-up double vision. An ever-present example of close-up double vision is the appearance of the nose, seen doubled, either side of a viewers’ visual field (Gibson, 1979: 117).

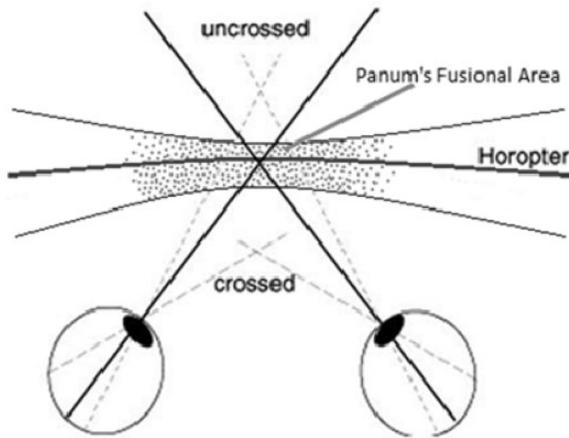


Figure 1. Panum's Fusional Area, uncrossed and crossed disparity.

Evan Walters

Evan Walters (1893–1951) was a Swansea born artist who became well known early in his career for his portrait and landscape paintings, produced in a traditional academic style. In the middle of his career, around 1936, Walters developed a theory of perception he called 'Double Vision', based on a moment of revelation in which, seated by a fire, he noticed the doubling effect while his eyes were unfocused when looking at his own foot (Plummer, 2011: 18). From that moment on, Walters found that 'innumerable double images always present in ordinary vision are seen quite plainly... once we become aware of their existence' (Stead in Plummer, 2011: 106). This moment stimulated a long period of research into various features of vision that are rarely recorded in painting or photography. Products of this research can be seen in many paintings and drawings done during the 1930s and 1940s, most of which are now housed in the Glynn Vivian Gallery, Swansea, and the National Museum of Wales in Cardiff. At first sight these pictures may seem bizarre abstractions, but on closer inspection, they reveal themselves to be rigorous studies of Walters' experience of a particular aspect of visual perception (Plummer, n.d.).

Highly enthused by the outcomes of his experiments, Walters mounted an exhibition of some of these works in 1936 at the Coolings Gallery, London, at his own expense. The result was a disaster, both critically and financially; none of the 22 pictures sold and his once lucrative career as a society portraitist fell into decline (Plummer, 2011: 19). Few people at the time understood what Walters was trying to achieve with his double vision artworks. Undaunted, Walters continued to relentlessly explore aspects of his visual phenomena, including double vision, until his death in 1951.

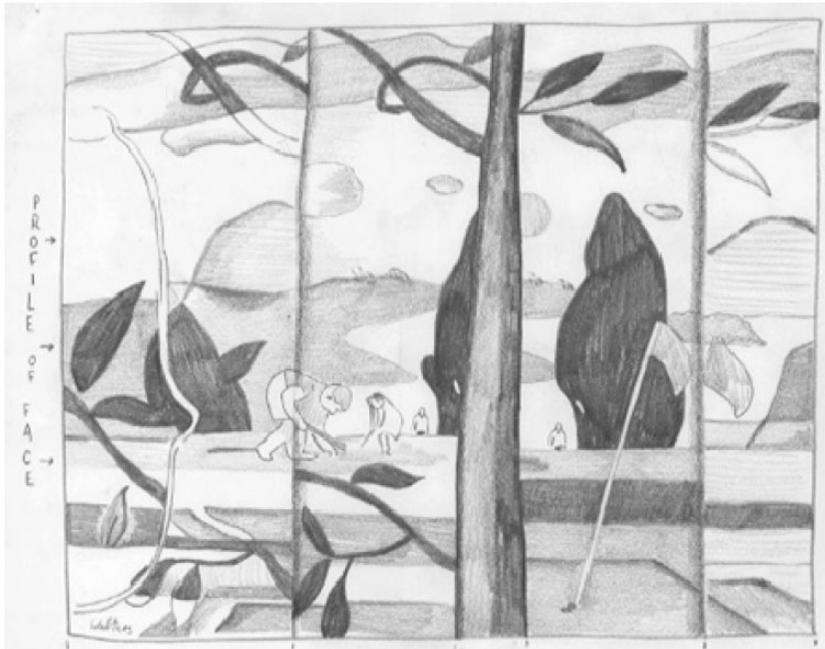


Figure 2. James Green, *A Drawing after Evan Walters' Boys at Golf*. Pencil on paper.

Walters' *Boys at Golf* (c. 1945) is an example of the artist attempting to incorporate different aspects of vision into one picture (see Figure 2). It is a view of a golf course from behind a tree, showing Walters' interpretation of the appearance of close-up double vision (crossed disparity), single vision, and double vision (uncrossed disparity). Close study of Walters' *Boys at Golf* reveals how he depicted these aspects of vision. The tree appears as two semi-transparent bands, which overlap to form a solid brown wedge running down the center of the picture. It would have appeared to Walters like this because he was standing too close to the tree to fuse it into single vision, and so it appears in close-up double vision (crossed disparity). Two of the boys playing golf appear single, being at the right distance from Walters for his eyes to fuse them into single vision. There is another boy partially occluded by the horizon, who appears twice, as do parts of the landscape behind him; they are too far away from Walters to fuse into single vision, and so appear in double vision (uncrossed disparity). Another interesting feature of *Boys at Golf* is the ghostly profile of a face on the left hand side of the picture. From other pictures made around the time of *Boys at Golf*, we can see that Walters was experimenting with how to depict the appearance of his nose in relation to the space around him.¹ The profile in *Boys at Golf* can reasonably be said to be Walters' depiction of his nose in relation to the tree seen in close-up double vision.



Figure 3. James Green, *A Mirror Mask Study*. Pencil on Paper.

Studio research

As a part of a programme of collaborative PhD research, directed by Robert Pepperell, James Green has been methodically investigating his own visual experience and attempting to record it through paintings and drawings. Green describes the genesis and aims of the work in this way: ‘During an earlier stage of the studio research, I had made a number of drawn studies of special masks with mirrors which were made as part of another project’ (see Figure 3).

In order to see my eyes reflected back in the mirrors that these masks contained, I had to stand very close to them, which caused them to appear to me in close-up double vision. These initial drawing studies resulted in a schematic ‘map’, with which I tried to place where things appeared in my visual field (see Figure 4).

To explain this map, the section in the center marks where both of my eyes converge, and is framed by the close-up double vision of my nose on either side. Any object (such as a mask) close enough to me appears in close-up double vision in this central area. There are peripheral areas to the right and left of the central

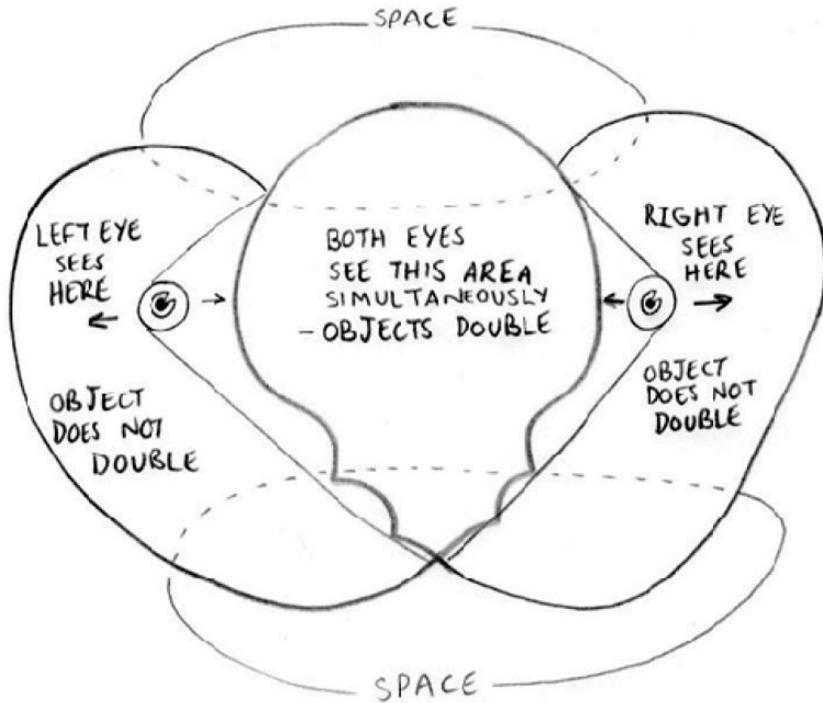


Figure 4. James Green, *Visual Field Map*. Pencil on paper.

area; the right eye seeing the right hand peripheral, the left eye seeing the left hand peripheral. Both eyes cannot converge in the peripheral areas because they are blocked by the sides of the nose (Gibson, 1979: 120). Odd visual 'distortions' occur when things are seen in peripheral vision, which I have also tried to depict.

From here, I went back to drawing from a simpler mask which did not contain a mirror. I had my easel set at a right angle to the mask so that I could stand close enough for the mask to appear in close-up double vision, and tried to draw what I saw. I used charcoal, which could be smudged into horizontal lines, the idea for which came from the fact that Walters made his double vision pictures using horizontal strokes, a technique which he believed helped to depict the effect of double vision (Meinel, n.d.).

The ideas and techniques used in the drawings discussed above gave rise to a series of pictures, all of which used the same mask in the same position relative to me in the studio. Each picture takes what I think Walters was trying to do in *Boys at Golf*, in different ways. For example, with some I have concentrated solely on the central area of my vision where close-up double vision occurs, in others, efforts have been made to depict what is happening in my peripheral vision. I have also varied the shape of the supports from picture to picture, and have warped some,



Figure 5. James Green, *Close-Up Double Vision Mask Study 4*. Acrylic on canvas.

so that the edges come out towards the viewer (see Figures 5 and 6). In all of these pictures I used a horizontal line technique that is directly inspired by Walters.

These pictures have been displayed to both artists and non-artists, and have observed the reactions they cause in those that view them. Most viewers, although not all, will walk to each picture, and peer at it just as I was looking at the mask in the studio – very closely so that their noses are almost touching the surface of the picture. I have also been told that these pictures are hard to look at for an extended period of time as they cause confusion to the eye. This, in a way, might be positive; if it is true these pictures do create confusion to the eye, then perhaps viewers are experiencing the same kind of vision I experienced while making them.

Further research

We have come across relatively few other artists who have tried to depict their own subjective experience of close-up double vision in this way (Pepperell and Ruschkowski, 2013: 12; Plummer, n.d.: 8). There are hints of similar phenomena in the work of Bonnard or Munch,² but few if any examples comparable to those made by Walters exist.

Part of the problem in research of this kind is that it relies on the depiction of an experience that is necessarily subjective, with little way of determining whether one's visual experience is comparable to anyone else's. We know from vision

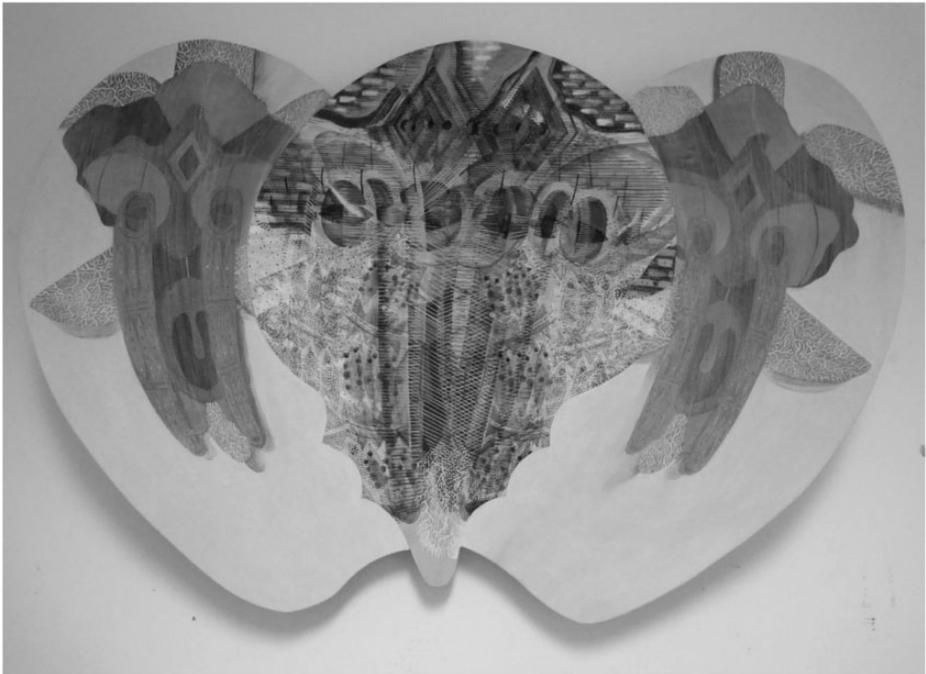


Figure 6. James Green, *Close-Up Double Vision Mask Study 4*. Acrylic on Board.

science that human visual experience varies from person to person, even when presented with the same stimuli: in effect everyone sees the world in a different way depending on his or her physiology, psychological make-up, and cultural background (Edgerton Jr, 1975: 6–14, 165; Gibson, 1979: 208). Further research is being planned with the aim of testing the degree to which the personal vision expressed in the work of Walters and Green correlates with the way others see, using a range of methods from introspective reporting to eye tracking. We are also investigating whether the study of different aspects of vision has value in the teaching of art, and in particular drawing, in a way that chimes with the suggestions made by Howard Riley (2014) in his contribution to this journal.

Conclusion

This research is a studio-based investigation into the depiction of visual experience, in particular the rarely recorded phenomenon of close-up double vision. We have found that the recording of visual experience through painting and drawing is a direct and valuable way to depict aspects of vision, and that the outcomes can be used to compare the visual experiences recorded within them to those of other viewers (Wade and Swanston, 2013: 44). From this research we may gain a better understanding of how we see the world.

It is also important to acknowledge the pioneering work undertaken by Evan Walters, and his contribution not only to Welsh art history but also to the artistic understanding of visual experience.

More generally, we believe artistic inquiries into how we see the world and understand our own position within it can have value beyond the immediate field of art. They can contribute to other areas where similar questions about the nature of visual experience are also being asked, such as philosophy, anthropology, neuroscience, optometry, and physics.

Notes

1. For examples of how Walters depicts the appearance of his nose, see *Still Life with Cricket Ball* 1940, Glynn Vivian Art Gallery, and *A Venetian Lady* 1948, Glynn Vivian Art Gallery.
2. See Pierre Bonnard, *Nature Mort au Citrons*, 1917-18, Musée Bonnard, or Edvard Munch, *Bohemens død*, 1925-1926, Munch Museet.

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Author biographies

James Green is a practice-based researcher in the final year of his PhD, which uses fine art methods to find a perspectival technique for depicting close-up double vision in artworks. He is also lecturer in drawing at Cardiff School of Art and Design, Cardiff Metropolitan University. James studied for his fine art degree at Cardiff School of Art and Design, and has a Masters degree in painting from the Royal College of Art, London. Research interests include artworks that attempt to depict certain aspects of vision, methods of perspective used throughout art history, collage techniques in pop art and digital art. James exhibits internationally, and lives and works in Cardiff.

Robert Pepperell is an artist and writer. He studied at the Slade School of Art and throughout the late 1980s and 1990s exhibited numerous innovative electronic works, including at Ars Electronica, the Barbican Gallery, Glasgow Gallery of Modern Art, the ICA, and the Millennium Dome. He has published several books, including *The Posthuman Condition* (1995 and 2003) and *The Postdigital Membrane* (with Michael Punt, 2000), as well as many articles, reviews and papers. He is currently Professor of Fine Art at Cardiff School of Art & Design where he researches the visual perception through art and scientific collaborations.