

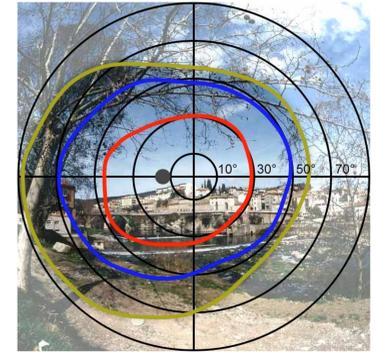
# the Visual Periphery in Art and Science

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The visual periphery (vision outside the center of gaze) is a subject of interest of many artists and scientists. This is not surprising, considering the visual periphery's importance for vision – it covers by far the largest area of our visual field - and its unique phenomenology. While vision scientists often investigate peripheral vision by measuring performance on simple stimuli under highly controlled conditions, artists are usually concerned with the appearance of complex objects and scenes when viewed outside the center of gaze. Here, we investigate drawings and paintings of the visual periphery from an artistic and a scientific point of view. We show that artists used different techniques to capture the indistinctness of the periphery, for example, by depicting increased blur, scrambled objects, or color fading. Moreover, we show that knowledge about the viewed scenes strongly shapes perception, influencing the resulting depictions. We examine these techniques and resulting images in light of current theories and findings in vision science, and demonstrate how drawings may help to shed light on mechanisms involved in peripheral vision.



Polar diagram of the visual field of a left human eye. The yellow line indicates the whole field of view (blue and red lines indicate decreasing color sensitivity with eccentricity). The dark disc shows the blind spot.

1



Rembrandt van Rijn, 1629, selfportait, oil on panel, 89,7 x 73,5 cm

Artists have (intentionally or not) depicted how the visual periphery appears in different ways: focal point, highlighting the point of interest (as often done), color and contrast fades in the periphery of the image (probably not mimicking peripheral vision) (fig.1), capturing a scene from different points of view and/ or as observed over an extended time period in contrast to a single point of view resembling clutter of peripheral vision (fig.3, 4, 6), color fading / less saturation (fig. 2, 3, 5), repetitions (fig. 4), distortions / scrambled objects (fig. 3, 5, 7, 8), blur / few details (fig. 2, 5, 7, 8)

2



Liu Yi - Watercolor on paper

3



Albert Gleisses, 1911, portrait of Jacques Nayral, oil on canvas, 162 x 114 cm

4



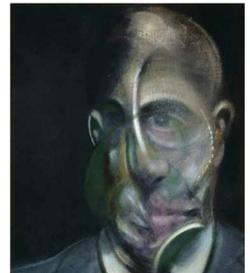
David Hockney - 1985 - Mother 1, Yorkshire Moores photographic collage - 21,6 x 33 cm

5



Robert Pepperell

7



Francis Bacon - 1976 - portrait of Michel Leiris (I) oil on canvas 34 x 29 cm

6



David Hockney - 1985 - place Fürstenberg, Paris, August 7, 8, 9 photographic collage - 88,9 x 80 cm

8



Francis Bacon, 1967, portrait of George Dyer, oil on canvas 35,8 x 30,4 cm

students work, fixating on a central point



Images (left panel) were presented (at 14 degrees eccentricity) when fixating on a central fixation dot. When not fixating the center, the images were masked. The artist (Tilde Van Uytven) never saw the image in direct view before finishing a painting (central column; compare to right column without fixation control). Many of the characteristics of the paintings resemble what was observed when investigating the appearance of the periphery with simple stimuli in crowding paradigms (e.g., Sayim and Wagemans, ECVF 2013). A strong loss of information and detail – even of very salient regions – with increasing eccentricity is apparent. We put forward that the loss of information in peripheral vision is much stronger than usually depicted by artists (but see fig. 2, 5).

Original image presented in the periphery



Painting with fixation control



Painting without fixation control

