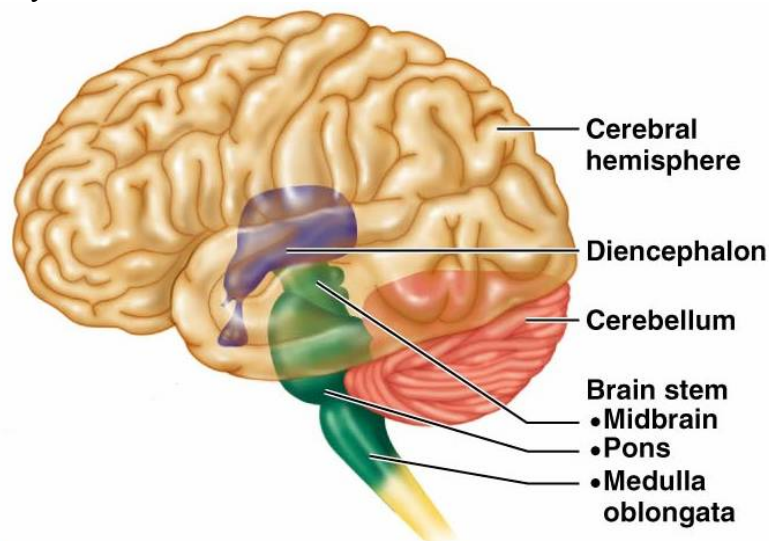
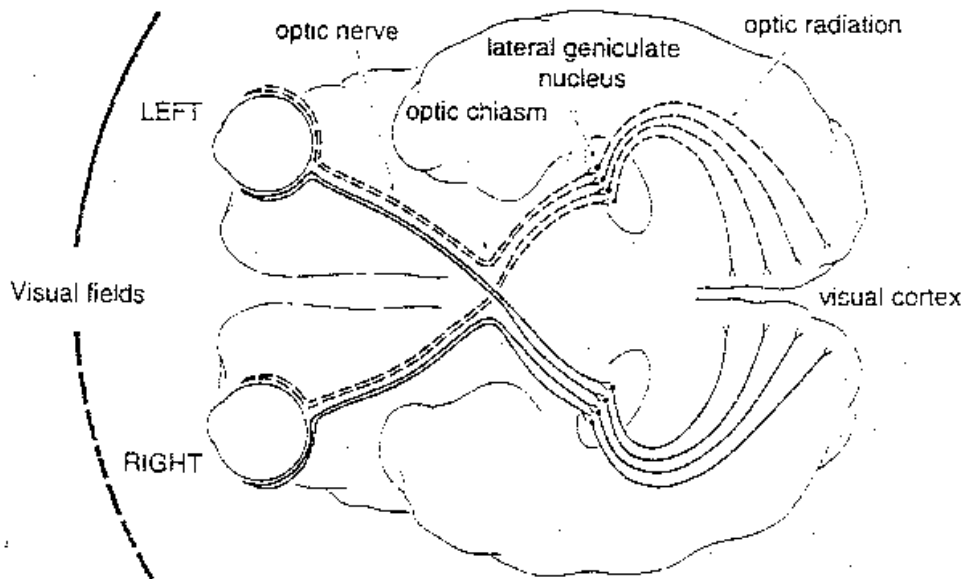


“If the doors of perception were cleaned everything would appear to man as it is, infinite.”
– William Blake

Imagine an inherent flexibility, one where an object one day takes on a complete transformation through meaning or intention. Suddenly, the phrase “things aren’t as they seem” takes a literal effect. Nothing is as was known. It is all new, brand new, and the distant sound of buzzing brains taking in the brand new experience, leaping into motion as if the cogwheels were kick-started by an electrical shock. Then it all makes sense, a moment of enlightenment washes over, and everything is right again. That is the alteration of perception. The imaginative correlations disrupting and simultaneously supporting boxed-in perceptions of reality. And it’s all for the individual. It is highly individual, highly energetic, and highly expressive. Art expresses the individual’s perception of reality. The brain and eyes conduct processes to receive information from the outside of our brains in. And somehow this tofu-like mass that resides in one’s very cranium can piece everything together into a coherent, inimitable reality. How?



The brain is composed of three parts, the cerebrum, cerebellum, and brainstem, all which include smaller bits and pieces to create one’s entire brain makeup. The cerebrum is the largest part of the brain, and performs higher functions such as touch, vision, hearing, speech, reasoning, emotions, learning, and fine motor skills. The cerebellum coordinates muscle movements, and maintains posture and balance and sensory nerves. Finally, the brainstem includes midbrain, pons, and medulla. The midbrain is the smallest part of the brain and is divided into anterior and posterior sections. Overall, the midbrain controls functions such as auditory and visual information relay. Portions of the midbrain are then dedicated to control and body movement. Pons works to relay messages between the cortex and cerebellum; they also play a key role in sleep and dreaming. The medulla assists in “transporting messages to the spinal cord and thalamus in the brain from the body” (“Medulla Oblongata”). It also controls breathing, heart and blood vessel function, digestion, sneezing and swallowing. The brainstem, cerebellum, and cerebrum are the three main components that make up the brain, and control mental and physical abilities.



As humans, sight and the function of seeing is a very important factors in the functionality of our brains, and thus in the way humans process their own perceptions and realities. Human eyes develop from specialised patches of skin. The retinas face inward and photoreceptors face the back of the eye, creating inverted images that focus onto a photosensitive layer at the back of the eye. Rod cells, or pigment columns, in the iris expand like a slinky to double its size when exposed to white light. Cone cells are in charge of the colour pigments absorbed through the eye and are commonly connected to a nerve called the fovea and “[d]ifferent cones are more receptive to long-wavelength (red), medium-wavelength (yellow), or short-wavelength (blue) light” (Ratey 101). Nerve cells carry information from single cone cells to the optic nerve. The iris is the clearest piece of living tissue visible without cutting into the body and is mostly composed of muscles covered in an opaque pigment that shields the light-sensitive retina. The outer muscles dilate the pupil in the dark, while an inner circle constricts in the light, thus creating depth of field. No two irises are the same, not even in the same skull.

The primary visual cortex (V1) is where light is interpreted in the brain, and is topographically organised. The optic nerve fibres fan out when they reach the geniculate as they leave the eye. Those fibres then extend through to the back of the brain. The cerebral cortex is the largest and almost entirely covers the cerebral hemisphere. Connections made by atoms disperse into various magno-cellular, parvo-cellular, cortex, and deeper structures in the brain. The cerebral cortex is the outermost layered structure of neural tissue and is classified by layers such as: 1, 2 and 3, 4A, 4B, 4C (which includes α and β), 5, and 6. In the V1, “neurons process incoming information and extract basic features from the image such as the location of edges, their orientation relative to horizontal, and the image disparity between the two eyes, which is one element of depth perception” (Berns 22). From the back of the brain where the V1 is located, the visual information then travels forward through the rest of the brain towards the rest of the frontal lobes. Through a process called laterization, the information received from the right eye travels to the left side of the visual cortex and vice versa to then interpret the data.

Perception generally refers to the way a situation is thought about or understood, but it also holds a much more fundamental sensory importance tied into neurological interpretation of visual reception and varying conscious response. Once the information is sent from the V1, it is divided into two systems to be processed in the frontal lobes. One regards information about the location and spatial organization regarding the body, the second road processes visual information, such as color and shape, creating a “where” and

“what” path. The “where” and “what” pathways then “coordinate with each other so that the end result is a seamless perception of what the eyes transmit...although you move your head and eyes constantly, your brain does not lose track of the objects surrounding you” (Berns 23). This leads into a complicated progression called “predictive coding”; keep in mind the brain runs hot, and to avoid overloading itself, devises alternates to expend less energy, and this is exactly that. Predictive coding is the brain making predictions about what it is seeing, and only changes those predictions when an error occurs (Berns 23). Additionally, in the process of an object, the human mind has cortical convolutions, folds in the brain found only in species with evolved visual cortices, which then enable us to combine visual messages with other sensory messages and past experiences, thus giving a unique meaning to particular visual sensations. Briefly returning to the second definition of perception, “Recognition and interpretation of sensory stimuli based chiefly on memory” (“Perception”) this gives us the second idea as follows: With the very human ability to attach meaning to an object, two new ideas emerge, those being attention and consciousness. Both attention and consciousness hold the aptitude to alter perceptions due to attentiveness in environments and consciousness of the behind-the-scenes of the perception process. Now, as previously covered, perceiving is to sort and categorise objects by their characteristics, so the opposite would be something not as conforming (i.e. imagination). As Berns phrases it in his book *Iconoclast*, “Categories are death to imagination” (Berns 58). New experiences force the brain into action in order to register new information, and as a result, force the perceptual system out of categories as well. Maintaining a consciousness over the use of one’s perceptual categories creates a new ability to see beyond such natural limitations (Berns 58). In summary, perceptual and environmental stimuli allow the process of surrounding environments and the ability to gauge an appropriate reaction to the stimulus received. When received, the mind transforms and interprets the information to give meaning to the subject, thus recognising it and becoming conscious of what one sees, or perceives. Essentially, perception is “[a] cycle of experience – dependant categorisation” (Berns 54). Revealing new experiences and subjects to the brain will create a fracture in the boxes perception naturally forms, as will consciousness to the individual’s use of them.

Consciousness is directly influenced by perception, memory, and cognitive ability. Many of the basic functions humans perform to keep themselves alive are, in fact, executed in the unconscious, for if focus were required to maintain internal body temperature while ensuring each breath was taken and each beat of the heart was pumped, the mind would implode from too much data with too little processing. The natural multitasking system also plays a role in memory and socialisation. “Consciousness relies on conscious experience for reference of its own memories and that conscious experience enhances communication” (Edelman 38). Humans, as established, like to attach meaning to what they see, which then brings forth the urge to communicate their experiences of emotion or perception; this also explains why perceptual processing and memory can dominate reactions, whether emotional or logical, to social or environmental stimuli and are sometimes conducted in unconscious manners wherein the conscious has not yet registered the so-called “gut reaction.” Human emotion is a perfect and preferable example, as William James addressed in his 1884 article, “My thesis...is that the bodily changes follow directly the PERCEPTION of [an] exciting fact, and that our feeling of the same changes as they occur IS the emotion” (as sourced in Mlodinow 2012). One may not realise they are feeling anger until they register the furrow in their brow, tenseness in their shoulders, and the uncomfortable feeling settling in their stomach as Gerald Edelman touches on: “In considering this picture, we must not forget that much of behaviour is determined by non-conscious interactions among the subcortical parts of the brain and the cerebral cortex” (Edelman 39). The awareness of emotions and emotional

responses to our environments also indicate a sense of consciousness, and thus a sense of individual perception.

“Every brain is wired differently” John Medina stresses throughout an entire chapter on brain wiring in his book *Brain Rules*, and this could not be a more correct statement, as the emphasis of the individual and expression of the individual is, from observation and experience, commonly misunderstood, however incredibly significant with the inspiration of social, and industrial revolutions. Perception is attuned to the individual according to previous experience, self-awareness, emotional and/or logical response, and the malleability of environments around them. In addition, spiritual existentialism creates the world to each of the individual humans on Earth which can be a result of varied experiences to induce extreme perceived realities triggered by one or more of the objects previously listed. The unique reality of the individual, as unique as the wiring of their brain, has been expressed in human behavior and, propelled by imagination, has assisted the industrialization of the modern world. Many actions we execute are either a direct or acute result of our perception of reality, or defiance thereof in the case of imagination, and said actions may then create a bridge to other people who then sympathize with the general consensus and lo, modern society is born and industrialized.

A particular expression of social and individual reality that will be targeted is that of art-making. “As a window into the brain, art thus functions to drive human evolution. In creating the work of art, the artist ‘evolves’ his or her own brain to a new stage” (Stein 220). Through creativity and art, conscious, perception, and cognitive processes of one’s mind can be openly displayed and such individualism of the brain will trigger artistic expression which will, in turn, alter the brain yet again to bring in a new perspective. Humans are fascinated with reality—expressing it, manipulating it, questioning it, and recreating it into something that they believe is an accurate, whether abstract or literal, representation of what they see, what they wish to see, the circumstances upon creation that altered the final product, and the final product itself. Although art is only one way to express such functions, it is one not often thought of as a neurological study. In many ways, art brings in a parallel to the simple subconscious perceptive process. “Essentially art is a trick that allows us to indirectly convey the structure of our minds” (as cited in Stein). “Art is an especially delightful mirror of sensory, emotional, and cognitive neural functions” (Stein 245). Art is also a method of storytelling, which relates back to the previous observation discussed; humans feel an urge to communicate their stories. Thus, experiencing art-making can parallel experiencing the perceived reality and emotions of an individual; the creative process parallels the perceptive process, and the final result and urge to share brings out a window into the individual’s brain, and supplies a mirror to those who look upon it to create social bonding over mutual interest. Art expresses the individualism of the individual, and has the potential to bring together a general consensus that could potentially lead to future action and is, therefore, an overlooked component of neurological study.

Neuroscience can show how the brain and eyes receive information, attempt to explain the processes, and provide explanations via chemical breakdowns. But humans will still live with a general consensus on what is reality (BBC) nevertheless, when someone comes along and disagrees, or shows off their own interpretation through art-making or stories, it opens a whole new world of possibility. The variations of intelligence, perception, and reality are as endless as the means of expression. However, art-making tends to draw a parallel with the neurological processing of perception, and offers a window into the mind of the artist; it is often overlooked as a tool for insight into the brain.

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