

Brain Illusions

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In general optical illusions are the use of shapes, colors, and line distortions to trick the eye and brain. When viewing confusing images, our brain can sometimes interpret visual information incorrectly, or sometimes our brain simply does the job of filling in the missing pieces.

So we usually end up getting deceptive or misleading images to our brain. And that explains a lot, there is a good chance that even our universe is interpreted by our brain differently than what it really is, as well as many things that we encounter in our daily life.

Could we simply be getting distorted images about our whole life? Or, are optical illusions a limited phenomenon to only certain cases that are explained scientifically?

Let's first look at some examples, like the following interesting image:

Optical Illusions

Hermann Grid 1

The Hermann Grid illusion depends on high contrast black and white areas to fool the eyes into perceiving intermediate grey areas. Imagine the Hermann Grid as a map of NYC streets; most intersections appear to be grey, but when you look closely at any individual intersection, you will see that it is white. The streets, on the other hand, appear white no matter where you look.

Hermann Grid

Also there are types of optical illusions that deal with color changes, like the one below, can you believe that square A is exactly the same shade of grey as square B? If you still think that the color of A is different than B, then you can take a piece of paper and make two small holes on it, the distance between the two holes should be the same as the distance between square A and B, the holes should be small enough to allow you see only the center of each square without the edges of the squares. Place the paper over the A and B squares and look through the 2 separate holes and you will see that both squares have the exactly the same shade of grey color. Only because the surrounding of each square has different colors it gives you the impression that square A and B are two different colors.

Optical Illusion

Types of Optical Illusions

As you can see, an optical illusion is any illusion that deceives the human visual system into perceiving something that is not present or incorrectly perceiving what is present. There are physiological illusions and cognitive illusions. A mirage is an example of a natural illusion that is an optical phenomenon. The variation in the apparent size of the Moon, small when seen in the middle of the sky, and larger when seen near the horizon, is another natural illusion; it is not an optical phenomenon, but rather a cognitive or perceptual illusion. And here is an example similar to the Moon illusion, can you focus on the dot in the center (on the left) and the dot in the center (to the right), which one is bigger? Amazingly they're both the same size, but since the dot on the left is surrounded by big dots, they make it look small and the opposite happens to the center dot on the right. The moon looks small when we see it in the middle of the huge sky, but once you see it near the horizon, and compare it to trees, buildings ... it starts to look bigger. Just like when a 6'2" guy is surrounded by 7' basketball players, he might actually look short.

Visual Illusion 3

Physiological illusions, such as the afterimages following bright lights or adapting stimuli of prolonged alternating patterns are the effects on the eyes or brain caused by a prolonged stimulation of a specific type such as brightness, tilt, color, movement ... etc. The following is just one example, the horizontal lines look tilted a little bit upwards or downwards, but in reality they're straight.

Physiological Illusion

Cognitive Illusions

Cognitive illusions are more interesting and well-known. Instead of demonstrating a physiological base they interact with different levels of perceptual processing, built-in assumptions or knowledge are misdirected. They are commonly divided into ambiguous, distorting, paradox, or fiction illusions. They often exploit the predictive hypotheses of early visual processing.

Ambiguous illusions for example are pictures or objects that offer significant changes in appearance. Perception will switch between the alternates as they are considered in turn as available data does not confirm a single view. The following is a good example; you can see either a woman walking or a huge face which looks like George Washington.

Cognitive Illusion

Other known illusions are: Ames room, Cafe wall, Converging line distortion illusion, Fraser spiral, Mach band, Missing square puzzle, Penrose triangle aka, the Impossible triangle, Size-weight illusion, Illusory figure ... etc.

The brain has a need to see familiar simple objects and has a tendency to create a whole image from individual elements. Our brain makes sense of shapes and symbols putting them together like a jigsaw puzzle, sometimes it formulates things that are not there. So again, what you see is not always what you get!!!

Please read pages 2 and 3 for more brain illusions

This is definitely one of the best-known optical illusions of all times! What do you see at first glance - an old woman or a young miss? They are both there!

A similar example of ambiguous optical illusions - father and son.

Whole family mind teaser - father with mother and daughter (by G. H. Fischer).

Sigmund Freud and what really on his mind is.

A landscape and the face of a bearded man.

Profile of Salvador Dali and a strange woman.

An old couple - see profiles of faces - is remembering the times when they were young and full of life - see the sitting characters ("Forever Always" by Octavio Ocampo©)

At first sight, what do you see? Do not focus on one region, now look again. You may be surprised (by Joseph Jastrow).

This is one of classic optical illusions - it is called dancing elephant. Try to count the number of his legs (by Roger Shepard).

This one is interesting. Children will probably see a group of playing dolphins. But adults see usually something else. It's called Message of Love from the Dolphins (by Sandro Del-Prete).

You probably recognize the face in this painting (it is St. George), but if you look at his hair, you'll see that he is fighting a fire-breathing dragon. It's called "St. George the Dragon Slayer" (by Sandro Del-Prete).