

Dear Reader,

We have a need to know about everything we possibly can. I feel as though most people can relate to that, at least I know I can. Ever since I was a kid, I have been very curious. I have wanted to know as much as I could about basically everything, and for the most part, I have gotten to learn about everything that I was interested in. One day a few years ago, I came across an optical illusion, and I had no idea what to make of it. How was it that my brain could process so much information at a time, yet it couldn't figure out how to process this image of, what seemed to be, coiled up snakes that were moving, yet at the same time were still? It completely baffled me. At that point I decided to not worry about it, and come back to it later. When this project was given to us, I realized that this was my chance to really dig deep into something that had confused me for a long while. I started researching only optical illusions, but then realized that there was so much more to them than I could have ever thought. It turned out that optical illusions went hand in hand with reality, and how humans perceive it. This was such an amazing discovery for me, because Reality was something that I had never considered. I always just thought that it was there, and that there was nothing more to it than what I saw or heard or smelled. I didn't really think much of it. Now that I have all of this information, I find myself wondering if I could really ever know everything there is to know about this subject. I have a feeling that nobody really knows everything about it, which in some ways is nice, and in some ways is very frustrating. It's nice because it keeps you thinking, thinking about all of the unknowns, and maybe coming up with your own ideas about what could be out there still. It is frustrating in the exact same ways. So, on the note of thinking about this subject endlessly, I'll leave you with this; everything that you see, smell, touch, hear, etc., will never be truly known.

Sincerely,
Lauren

In 1953, a man by the name of Aldous Huxley was involved in an experiment. He was a guinea pig for a drug called Mescaline, which is a major component of peyote. Mescaline has been known to change your perception of reality and also your quality of consciousness. Scientists distilled the Mescaline, and had him dissolve four-tenths of a gram of it in half a glass of water, and then drink it. Huxley noted that when he took the drug he expected that his visual mind would go out of control, and cause him to be over-imaginative. That was not what happened at all. What really happened was that there was a major change in the realm of his objective fact, and his subjective side was changed by a very unimportant amount. One thing Huxley noticed as that spatial relationships ceased to exist. When on Mescaline, the mind does not worry much about the Where? And the How Far? It worries more about objects' intensity of existence. The brain leaves behind the fact part of reality, and focuses more on being, and meaning (Doors of Perception, erowid.org). This situation is an example of someone having an experience where they believe they witnessed what reality really was, and not the filtered reality we experience on a regular basis.

Humans never really know what's real, because once we realize what we are seeing, hearing, feeling etc., it has gone through so many changes it is no longer in its pure form. How do we perceive reality? Peter Russell studied theoretical physics at Cambridge University. He now has a website that helps make sense of how humans can perceive reality. Russell said, "all that I see, hear, taste, touch smell and feel has been created from the data fed to me by my sensory organs." (Reality and Consciousness). He notes that there are two ways in which we use the word reality. There's reality we experience, and there's the underlying reality that we don't know directly, but is the source of our experience. In Indian philosophy, those two types of reality are called the Absolute and the Relative, Absolute being the underlying and Relative being the reality we observe, the reality we create in our minds. There is only one underlying reality, one that we probably will never be able to experience (Reality and Consciousness). Reality and our perception of reality are personal constructs that are rooted in scientific and philosophical reasoning. Reality cannot be experienced in its purest form due to sensory filters and imposed understandings. As exemplified through optical illusions, what we are actually seeing and what we perceive to see depend on multiple factors.

When I first thought of reality, I thought of just what we see on a daily basis. What we hear, what we taste, and what we feel. When I went to research this topic, I found out it was way more than just that. More than you could ever understand. The simple definition of reality is everything that appears to our five senses. But as I kept digging deeper and deeper into this subject, I found out that reality is actually something that we create in our own minds. What we experience on a daily basis, the seeing, the smelling, etc., is actually mind generated. There many different realities out there, actually about six billion of them. Every person creates their own unique reality; no two are ever the same. There are aspects of this world that only exist in our minds, like color, sound, smell, and many others. Those qualities do not exist in the physical world; they were created and named by us. All of the aspects of the underlying reality are filtered in through our five senses, causing us to experience just a touch of what reality is, and because of that, we come up with a version of that reality we think is true. We just see what our minds tell us to see. Peter Russell notes that "Time and space are not inherent qualities of the physical world; they are a reflection of the way the mind operates, the perceptual framework within which our entire experience of the world is constructed" (Reality and Consciousness). It would seem obvious to us that time and space are real, and are important qualities of this world, but what we

don't realize that time and space are also just creations of the human mind. Nothing really is, as it seems. How does perception work? Perception has a lot to do with the brain, mostly concerning the two halves of the brain, the right brain and the left-brain. The two sides of the brain are completely different, but they have to work together in order for you to be able to process everything that you take in through your eyes. The right brain is all about the present moment, it thinks entirely in pictures and learns through the kinesthetic movement of your body. It really doesn't know the difference between your individual consciousness and the world around you (What is Reality?). The left-brain, on the other hand, thinks more methodically, and is also the language half of your brain, which is what creates your internal voice. Your internal voice is what the left-brain picks out countless details from the events in the past and tries to make predictions about the future (What is Reality?). To help you see this a little more clearly, a picture: (picture on last page)

Both sides of your brain control your perception, so without the function of one side of your brain, you would not be able to perceive the world around you. Perception is what causes us to process images. When we look around at the world, and take in all of the objects around us, we perceive reality. Without perception, there would be no reality.

Optical illusions have a lot to do with reality and perception. The whole point of an optical illusion is that you think you are seeing one thing, but really what you are seeing is completely different than what is actually in front of you. Michael Bach said that an illusion is "a mismatch between the immediate visual impression and the actual properties of the object" (ABC News - When your Brain Can't Believe Your Eyes). Optical illusions can roughly be separated into three different categories. Physical illusions, which are phenomenal illusions that occur before light enters the eye, like a mirage or a rainbow. Physiological illusions are the effects on the eyes or brain of prolonged stimulation of a certain kind, like brightness, tilt, color, and movement. And lastly, visual cognitive illusions are illusions that interact with different levels of perceptual processing, and inbuilt assumptions or 'knowledge' become misdirected (What is an Optical Illusion? - Archimedes Lab). When some people think of optical illusions, they assume that everything happens within the eyes. Actually, using the word 'optical' is very misleading because no part of experiencing an *optical* illusion happens in the eyes, it's all in the brain. A more accurate name would be a visual illusion (ABC News). An example of an actual optical illusion would be floaters. Floaters are those little specks or circles that appear in your field of vision. Those are caused by an irregularity in the fluid of your eyes. Nearly every single other illusion happens on the brain level. What really happens is that the brain attempts to see the future. When the brain tries to see an image, it is taking a guess at the near future by trying to fast-forward a tenth of a second. That effect is called "natural delay", and what it means is that you might not perceive an image as it actually is, but what you think it might soon be (ABC News).

There is an illusion called the checker shadow illusion (image on last page). This illusion is very deceiving. It looks like check A and check B are completely different colors, but really they are the exact same color. In this particular illusion, there are two "tricks" that cause your brain to process this image incorrectly. The first is based on contrast between the color of the squares surrounding B. B is surrounded by all dark checks, which makes it look much lighter than it actually is. The second one is based on the fact that the shadow of the cylinder has a very soft edge all around, while all of the checks around it have very sharp edges. Our eyes, along with other parts of our visual system, tries to ignore the shadow. It ignores the shadow because it has a gradual change in colors, which makes it harder for us to determine the color of the actual

surface (MIT - Checker Shadow Illusion). All that being said, it may not seem obvious that the two connect, but they do. When you look at an optical illusion your mind is creating a reality that is different from what is actually there, which is why your eyes and your brain don't match up. That idea of not really being able to see what is actually there is something that I have wrestled with for a very long time, and probably will continue to wrestle with.

Reality can never be experienced in its true form. Every time we observe something, just the act of seeing it or hearing it and so on, affects it and changes it. There is nothing that we can do to stop that or change it, it is just the way things will always be. We will never really experience the underlying reality. We can experience aspects of it, and those aspects are what help create a general reality that everyone experiences in some way. Although we never consciously realize that this filtering of sorts is actually happening, there is a way that one can become more aware of it. Just knowing about it, first of all, is something that you can do to make yourself aware of what is actually happening. I can say that personally just knowing about how we process reality has changed the way I see the world. It has made me more aware of my surroundings, and also made me question my surroundings more. There are definitely ways in which we can become more aware of reality, but is there really any way that we can fully understand reality in its entirety?

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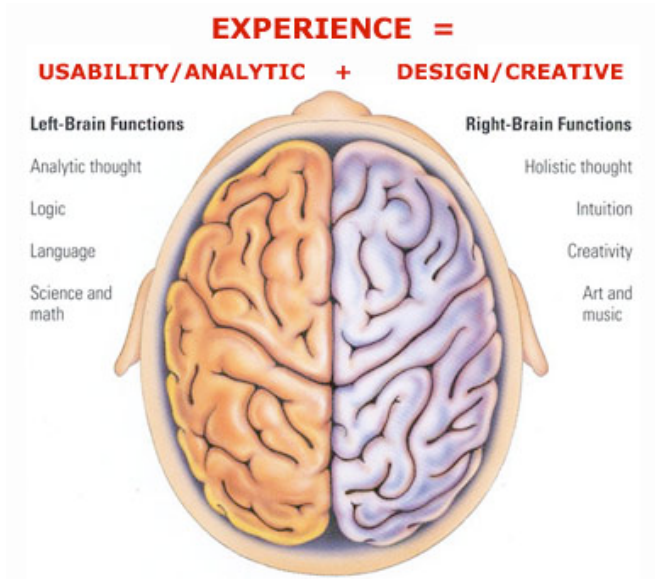
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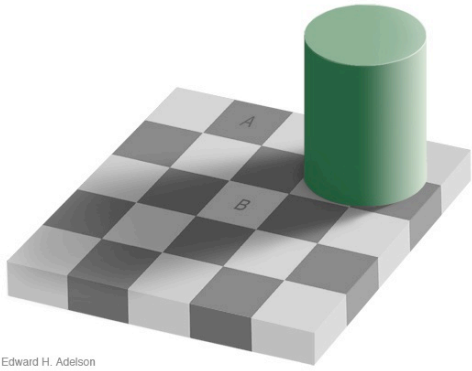
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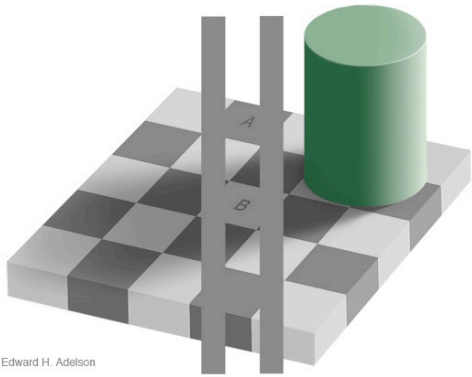
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(Brain Halves- google images)



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(Checker Shadow Illusion)