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ON THE BORDER

Info & insights from the interface between energy healing & science

May 2011



Welcome to the May 2011 edition of 'On the Border'.

For those of you new to 'On the Border', this is Jayne's monthly Ezine newsletter about the latest information and insights into energy fields, healing and science. Each month I share with you some of the latest research and how it applies to healing, energy work & (daily) life. There's a Fascinating Facts section and also a 'Freebie' where you get something for nothing, gratis.

When Your Eyes Deceive: The Power of Optical Illusions

Illusions help us to see things that do not match physical reality. For scientists they are very important in the understanding of the neural mechanisms of perception and cognition. Here are some of the Greatest Optical Illusions of All Time, with the science explanation in so far as it is known, plus a couple of new 'modern day' illusions. Enjoy!

Whereas scientists once created classical illusions from simple lines and shapes, and artists focused on making eye-popping illusions, the overlap between science and art is now greater than ever. Computer and video technologies are now making it possible to create increasingly complex moving-picture illusions. Scientists are using graphic-design tools to make their illusions more artistic, and artists have grown more knowledgeable about the neuroscience behind the magic.

My wife and my mother-in-law

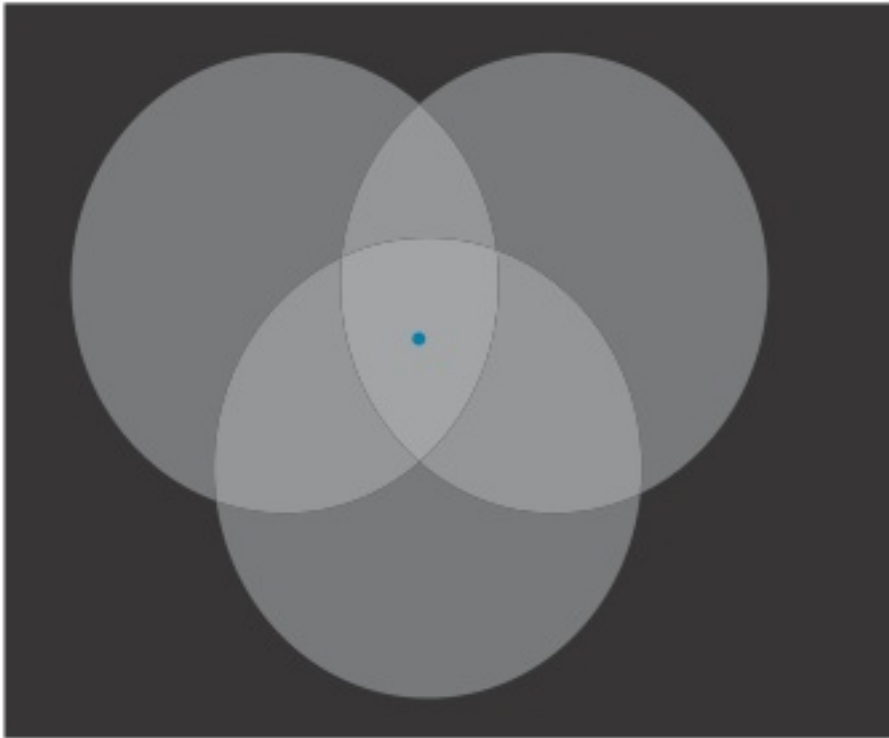
A simple sketch by English artist W. E. Hill entitled 'My Wife and My Mother-in-Law,' was reproduced in the magazine Puck in 1915. But it was only when experimental psychologist Edwin Boring of Harvard University described the two faces in 1930 that science took interest in it. This effect is called perceptual ambiguity. Our brain is able to reconstruct different learned interpretations, but only one can be perceived at any given moment. In Boring's words, the drawing "shows in one figure the left profile of a



young woman, three-quarters from behind. The other figure is an old woman, three-quarters from the front. The ear of the 'wife' is the left eye of the 'mother-in-law'; the left eyelash of the former is the right eyelash of the latter; the jaw of the former is the nose of the latter; the neck-ribbon of the former, the mouth of the latter." Whereas Helen of Troy's face was supposedly the face that launched a thousand ships, this optical illusion was the face (or faces) that launched a thousand experiments on visual deception!

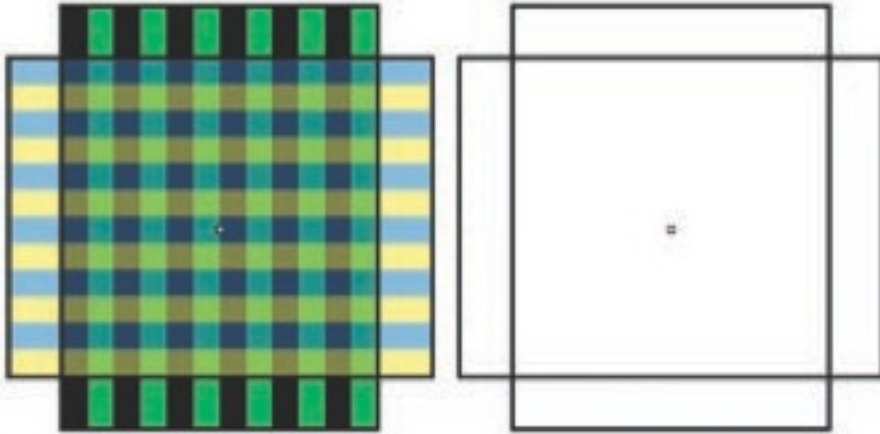
Attention to Afterimages

One of the simplest but most important illusions ever discovered consists of three semitransparent overlapping circles.



Look carefully at the blue dot at the centre of the three intersecting disks while directing your attention to each of the three disks in turn. If you are paying attention to the bottom disc, for example, you will see that it looks brighter than the other two discs. The same is true when you turn your attention to one of the other discs. Before this illusion, neurophysiologists believed that people cast a spotlight of attention on a specific location, leaving the rest of the world in relative darkness. This illusion showed that the spotlight concept was literally true, not just a useful metaphor.

Nowadays it has been shown attention bias can also affect the perception of afterimages, the illusory images that linger after you look at a bright light or stare at a picture for a while. Focus your gaze on the centre of the checkered pattern below for one full minute, then shift your eyes to the empty rectangles at the right.



You will see a colourful afterimage filling in the formerly empty frames. Pay attention to the vertical rectangle, and you will see an afterimage that matches it. Pay attention to the horizontal rectangle, and you will see a different afterimage. You can go back and forth between the two afterimages simply by shifting your attention from one rectangle to the other.

Afterimages help scientists understand how neurons in our eyes and brains temporarily cease responding to an unchanging stimulus. It is during this temporary period before the neurons reset to their normal, responsive state that we can see afterimages. Neuroscientists know that neurons in the retina play a role in the perception of afterimages, but it has been difficult to demonstrate the importance of neural processing at higher levels in the visual pathway from the eye to the brain. This last illusion unequivocally proves that afterimages can be strongly affected by cognitive processes such as attention.

Facing the Facts

Peter Thompson of the University of York in England revolutionized the field of face perception when he created this Margaret Thatcher illusion in 1980.



The top and bottom rows of Thatcher images are identical to each other but flipped vertically. The top row looks like two upside-down Thatchers, no problem there. But the bottom row looks like a Thatcher on the left and a horrible mutant on the right. The reason is that whereas the left column depicts normal faces (although the upper face is upside down), the right column shows Frankenstein-ish composites of Thatcher with eyes and mouths flipped vertically. The Thatcher at the upper right does not freak you out, because the eyes and mouth are right side up (although the overall face is upside down), and your face-perception neurons therefore see them as “normal” (even though they do not match the rest of the face). The bottom right image, on the contrary, is creepy because the eyes and mouth are upside down and thus all wrong, despite the fact that the face as a whole is right side up.

Thompson's has created a more recent illusion: fat face thin face illusion below.



Whereas the Margaret Thatcher illusion showed that faces are more difficult to recognise upside down and that sometimes we misperceive the facial expressions of inverted faces, the new illusion demonstrates that the internal features of a face—such as the eyes, nose and mouth—can distort our perception of face shape: when the face is upside down, it appears to be slimmer.

The Invisible Gorilla

In a famous experiment done in 1999, Daniel Simons and Christopher Chabris, both then at Harvard University, asked subjects to watch two groups of people dribbling and passing a basketball among themselves. Three players wore white shirts; three wore black. The watchers were asked to count the number of passes by the players in white shirts. About halfway through the exercise, a person wearing a gorilla suit walked into the ball-passing scene, beat its chest while facing the camera, then walked out. Simons and Chabris were shocked to discover that 50 percent of the people counting passes failed to notice



the gorilla. Their spectacular demonstration became an instant classic, spreading like wildfire to conferences, university courses and textbooks. It is an excellent example of attention bias, a phenomenon in which the brain ignores information that is not relevant to its current task.

The gorilla illusion is so well known that Simons, now at the University of Illinois, decided to create a variation for the 2010 illusion contest. He appeared at the gala dressed as a gorilla, flinging bananas to the audience before he took the stage. “You are all good vision scientists,” he said. “You know that when people are passing basketballs, you should be looking for gorillas.” The audience roared with laughter at the inside joke. People can only experience the invisible gorilla illusion once. After you know to look for a gorilla, you never miss it again. Does knowledge of the impending occurrence of unexpected events help you detect other unexpected events? Simons’s latest demonstration, called the monkey business illusion, shows the answer to be no. People who know to look for a gorilla are of course more likely to spot the gorilla, but the gorilla is not truly unexpected. These same expert viewers will fail to notice other unexpected events even more than viewers who are unfamiliar with the task.

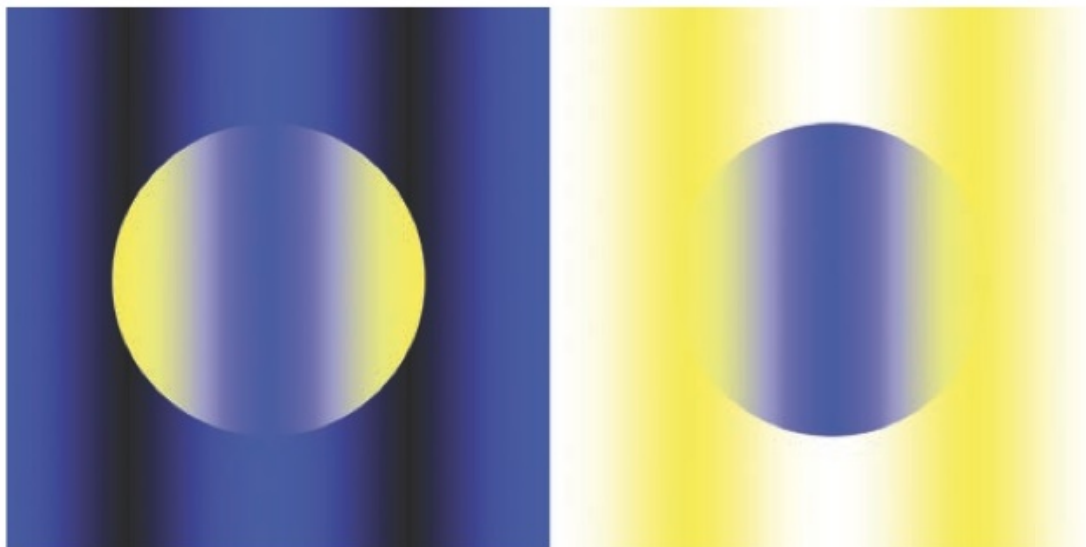
The harder you pay attention during a task, the more powerfully your visual system suppresses distracting information, as have been shown in experiments conducted with neuroscientist Jose-Manuel Alonso and his colleagues at the State University of New York, College of Optometry. The more you watch out for the gorilla that you expect to appear, the more you will miss other changes that are unexpected.

To see the illusion plus some extras, go to :

http://www.youtube.com/watch?v=IGQmdoK_ZfY&feature=player_embedded.

Colours can change: yellow moon, blue moon

Here we have two moons out of space. One yellow and one blue. Or are they?



Actually both moons are exactly the same colour in this illusion by psychologist Akiyoshi Kitaoka of Ritsumeikan University in Japan; only the surrounding colours are different. If you don't believe it, cut out the two moons— you'll find them to be identical. The appearance of colors is all about their context.

Defying the laws of gravity?

Four wooden balls rolling uphill, as if magnetised, in open defiance of the laws of gravity? Watch this video and see what you make of it:

http://www.youtube.com/watch?v=hAXmodIuyug&feature=player_embedded

The trick is exposed when the video shows the slopes from a different vantage point: the wooden balls are actually rolling down, not up. The slopes are cleverly designed to produce the antigravity illusion when seen from a specific point of view. It relies not only on a trick of perspective but also on perceptual ambiguity. There is more than one way to perceive the “magnetic” slopes, but our visual system's expectations make us prefer one interpretation—and illusions are a way to fool the brain into revealing those systems. We are surrounded by many industrial products that are made with right angles, such as desks, boxes and buildings. When confronted with an image in which multiple interpretations are possible, we choose the version that allows us to see rectangular solids. In this illusion, none of the columns that support the ramps are vertical. Yet we interpret them all as perfectly straight.

References:

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- ◆ The Invisible Gorilla: And Other Ways Our Intuitions Deceive Us. Christopher Chabris and Daniel Simons. Crown Archetype, 2010.
- ◆ Sleights of Mind: What the Neuroscience of Magic Reveals about Our Everyday Deceptions. Stephen L. Macknik and Susana Martinez-Conde, with Sandra Blakeslee. Henry Holt, 2010.
- ◆ Sleights of Mind: What the Neuroscience of Magic Reveals about Our Everyday Deceptions. Susanna Martinez-Conde, Stephen L. Macknick and Sandra Blakeslee.

Fascinating Facts

Did you know that.....

- Beards are the fastest growing hairs on the human body. If the average man never trimmed his beard, it would grow to nearly about 10 metres long in his lifetime.
- Every human spent about half an hour as a single cell.
- Did you ever notice that your fingernails grow faster than toenails?

- Humans shed about 600,000 particles of skin every hour - about 1.5 pounds a year. By 70 years of age, an average person will have lost 105 pounds of skin.
- Your stomach has to produce a new layer of mucus every two weeks otherwise it will digest itself.
- You use an average of 43 muscles for a frown. You use an average of 17 muscles for a smile.

May Freebie

In this section you get the chance to get something for nothing. Helemaal gratis. Always a pleasure!

This month features a TED talk from Max Strom called '[There is no app for happiness](#)' Makes for interesting viewing at just 16 minutes.

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