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What Can Magicians Teach Us about the Brain?: Scientific American

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Description

A magician tosses a ball into the air once, twice, three times. Suddenly, the ball vanishes in mid-flight. What happened?

Don't worry, the laws of physics haven't been broken. Magicians do not have supernatural powers; rather, they are masters of exploiting nuances of human perception, attention, and awareness. In light of this, a recent Nature Reviews Neuroscience paper , coauthored by a combination of neuroscientists (Stephen L. Macknik, Susana Martinez-Conde, both at the Barrows Neurological Institute) and magicians (Mac King, James Randi, Apollo Robbins, Teller, John Thompson), describes various ways magicians manipulate our perceptions , and proposes that these methods should inform and aid the neuroscientific study of attention and awareness.

Magicians Secrets Revealed

The underlying concept of using quirks in human perception to learn about how the mind works is an old one. Visual, auditory and multisensory illusions , in which people's perceptions contradict the physical properties of the stimuli, have long been used by psychologists to study the mechanisms of sensory processing. Magicians use such sensory illusions in their tricks, but they also heavily use cognitive illusions, manipulating people's attention, trains of logic and even memory. Although magicians probably haven't studied these phenomena with the scientific method—they don't do controlled experiments—their techniques have been tested over time, perfected by practice and performed under conditions of high scrutiny by skeptical audiences looking to spot the trick.

An example of a visual illusion used by magicians is spoon bending, in which a rigid horizontal spoon appears flexible when shaken up and down at a certain rate. This effect occurs because of how different parts of objects (in this case, the spoon) are represented in the brain. Certain neurons are responsive to the ends/corners of the object, whereas others respond to the bars/edges; the end-responsive neurons respond differently to motion ...

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