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PRESTO! WHAT MAGIC CAN TEACH US ABOUT

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It is one of the newest, unlikeliest, and most promising attempts to understand the causes, and develop the cures, for Alzheimer's, ADHD, and other diseases of and traumas to the brain: Magic.

"People don't realize that magicians get at the same issues of attention, consciousness, and failings of the nervous system that academics do," says Susana Martinez-Conde, director of the laboratory of visual neuroscience at the Barrow Neurological Institute. (She has recently co-authored two pieces in scientific journals on the topic.)

"If we had paid more attention to magicians, we'd have made discoveries sooner," she says. "We have arrived at conclusions that they knew all along."

Such as: We often see things that are not there, and just as often do not see things that are in our direct line of vision. Our experience of the physical world is not only profoundly limited but often wrong. Our perceived reality is just that - perceived. The more we know about the way the things work - the more sophisticated we become at predicting a likely outcome - the more gullible we become. These discoveries, known intuitively and over centuries by the best Houdini's, have astounded scientists: "The consciousness-awareness community," says Martinez-Conde, "had not been aware of these resources."

The twining of the magic and neuroscience is something of a happy accident. A year-and-a-half ago, Martinez-Conde and colleague Stephen Macknik were asked to co-chair a gathering of academics and philosophers. The topic: The study of consciousness. The location: Las Vegas. "We realized we had a great opportunity to bring in magicians - we asked five [of the best] to put together a special symposium."

Among the invited were James Randi ("The Amazing Randi"), Teller (of Penn & Teller, the duo famous for revealing their methods) and Apollo Robbins, who prefers to be called "an honest thief" (his act involves pick-pocketing forewarned audience members).

"There are sound biological backings to what we're doing," says Robbins, who will speak at the New York Academy of Science on Jan. 12 (it's open to the public). "We're assuming that misdirection is not just fooling the eyes, but that it's cognitive."

"The whole ability to study people in a physiological way is relatively new to science," says Teller. "People who look for differences in the way we perceive and misperceive things have traditionally been philosophers."

One of the most revered experiments among cognitive scientists is known, colloquially, as "the gorilla experiment." It involves asking a control group to watch a short video, in which two teams - one in black T-shirts, one in white - pass a basketball around. The group is asked to count the amount of successful passes made. Most usually come up with the right number, but most also have no recollection of the man in the gorilla suit striding into the middle of the frame, leisurely pounding his chest, then sauntering off.

This experiment is so beloved because it proves the ability of external forces to cause internal "attention-splitting." Put simply, we can't pay attention to everything at once. Assessing demands and diverting our cognitive resources is an evolutionary adaptation that allows us to advance individually and as a civilization. But, as Robbins points out, "every time we automate a task" - tying a shoelace, driving a car, text-messaging - "we open up another opportunity to be deceived." This is because humans are wired to pattern-build; the more outcomes we can rightly predict, the more information we can bypass and/or synthesize. Hence, we are able to exponentially accomplish more, faster.

"It is commonly believed that because an object is in your visual field, you can see it," says neuroscientist Macknik. "That's not necessarily true. The brain selects the objects that are important to you and brings them to your awareness. Our cognition is fundamental to how we perceive everything."

The potential real-world applications of the neuroscience of magic are staggering. Discoveries in the function and cognition of attention may change everything from teaching to the medication of behaviorally challenged children to the admittance of eyewitness testimony in criminal court - even counter-terrorism methods. (Terrorists are masters in the art of attention-splitting.) Martinez-Conde expresses surprise that no one from the government has yet contacted her or her colleagues: "Maybe they don't know," she says.



Penn & Teller.

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