





CHIP SIMONS (outline);
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**BELIEF IN THE PARANORMAL ARISES
FROM THE SAME BRAIN MECHANISMS
THAT SHAPE MOST HUMAN THOUGHT**
BY RICHARD WISEMAN

You may have never personally caught sight of Jesus Christ's face in a potato chip, but you have likely succumbed to an equally improbable belief at some point in your life. Many people claim that ghosts exist or that their dreams can predict the future. Some individuals even think they have seen the face of the Virgin Mary in a grilled cheese sandwich and Mother Teresa in a cinnamon bun.

WIRED FOR WEIRD

Although such beliefs may sound farfetched, they are surprisingly common. An opinion poll conducted in 2005 showed that three out of four Americans believe in the existence of paranormal phenomena. Other work has revealed that about one in three of us claim to have experienced the supernatural. The sheer ubiquity of these experiences has led many psychologists to wonder whether common mechanisms might underlie some of these widespread convictions.

The list of strange effects that members of our species believe in ranges far beyond the limits of scientific evidence, including telepathy, clairvoyance, foreknowledge of the future, the control of matter with one's mind and the ability to commune with the dead. Psychologists are now beginning to tease out why so many of us believe in phenomena that defy logical explanation, revealing a surprising truth. Belief in the paranormal is not the provenance of a select group of individuals who are fundamentally different from the rest of us. We are all wired for weird.



Since the 1930s researchers have sought solid proof of psychic abilities by testing whether individuals could discern the order of a deck of cards, to no avail.

The Dream of Prophecy

The scientific study of allegedly paranormal phenomena began in earnest with work in the 1930s by parapsychologist Joseph Banks Rhine of Duke University. Originally trained as a botanist, Rhine attended a lecture on spiritualism given by author Arthur Conan Doyle, who alerted him to the possible existence of extrasensory perception. Rhine and his colleagues spent the next 40 years investigating whether people could deploy psychic skills to figure out the order of a shuffled deck of cards.

Rhine's early results looked promising, but his findings

one false dawn after another, and as one parapsychology laboratory after another closed down, they turned their attention to a far more robust phenomenon—why so many people believe in the paranormal.

To explain some of these supernatural effects, my colleagues and I have drawn heavily from some of the biggest findings in psychology in recent decades, especially regarding the irrational behaviors that we all display in most aspects of our lives. For example, consider dream precognition, which is the sense that a dream foreshadows reality. It is one of the most commonly reported forms of paranormal belief. Research into the science of sleep has revealed that the vast majority of people have about four dreams a night, with each one lasting around 15 minutes. Once in a while, some people experience an uncanny resemblance between one of their dreams and subsequent events, and they infer that they possess the gift of prophesy.

In 1993 psychologist Scott F. Madey, now at Shippensburg

THE SAME MECHANISMS THAT ENABLE YOU TO SEE PATTERNS AND DRAW CONCLUSIONS FROM LIMITED DATA CAN ALSO TURN UP FALSE POSITIVE RESULTS—OR EVEN GO INTO OVERDRIVE.

proved difficult to replicate, and researchers eventually moved away from card guessing and developed other types of experiments to probe the paranormal. This pattern has repeated itself for the past 80 years, with scientists reporting that a new experimental procedure had finally produced solid evidence for extrasensory perception, only to discover that their initial success could not be reproduced [see box on opposite page]. In the 1980s several researchers working in different universities across the world became disillusioned with the emergence of

University, reported an experiment that he and his colleagues had designed to find out how common the tendency to link dreams with reality is. The researchers asked a group of students to read a diary supposedly written by someone who thought she had precognitive dreams. The diary contained a description of all the dreams, along with an account of events from her life, that either suggested the dream had been accurate or inaccurate. When asked to remember as many of the dreams as possible, subjects recalled about 60 percent of the ones that coincided with a real-life event versus just 40 percent of the others. The result suggests that we generally remember the dreams that come true better than those that do not.

The psychology literature is rich with examples of this effect outside the realm of the paranormal. In the mid-1990s, for example, researchers Donald Redelmeier of the University of Toronto and Amos Tversky of Stanford University investigated the purported link between arthritic pain and the weather. For hundreds of years sufferers have convinced themselves that their arthritis flares up with certain changes in temperature, barometric pressure and humidity. To find out if this was really the case, Redelmeier and Tversky asked a group afflicted with rheumatoid arthritis to rate their pain levels twice a month for more than a year. The research team then obtained detailed information about the local temperature, barometric pressure and humidity over the same period. All the patients believed the weather worsened their pain. The data, however, showed no such relation. The subjects, it seemed, had focused on the times

FAST FACTS

Otherworldly Observations

- 1 >> Most of us report that we believe in supernatural powers such as clairvoyance and telepathy and in the existence of ghosts.
- 2 >> The widespread reports of paranormal experiences very likely derive from many of the same mechanisms that help us make decisions in daily life.
- 3 >> Research suggests that a highly active right-brain hemisphere may cause someone to be particularly susceptible to improbable beliefs.



That we see faces in light and dark patches reflects the brain's finely honed pattern-recognition skills.

when high levels of pain were associated with especially odd weather patterns, forgotten about the times when this was not the case, and erroneously concluded that the two were related.

The fact that we sometimes see patterns where none exist is largely a side effect of our normal reasoning. In our daily lives we repeatedly encounter pairs of events that are genuinely related: You press the accelerator pedal, and your car speeds up. You see gray clouds in the sky, and seconds later it starts to rain. You eat food that tastes odd, and soon you start to feel ill. Indeed, not drawing connections between events could threaten your existence. The same mechanisms that enable us to draw conclusions quickly from limited data can also turn up false positive results—or even go into overdrive.

Ghost in the Machine

A similar line of reasoning can explain our reactions to things that go bump in the night. In 2004 psychologist Justin Barrett of the University of Oxford proposed one of the most popular theories about why people believe in ghosts. He thinks some of our paranormal proclivities stem from a neural mechanism he termed the agency-detection device.

Understanding what motivates people, Barrett argues, is essential to our everyday interactions with one another. Just as recognizing patterns in sparse information can sometimes lead us astray, the parts of the brain responsible for detecting the reasons behind actions can cause almost all of us to see human-like behavior in even the most meaningless stimuli.

For example, consider the now classic experiment from the 1940s by psychologists Fritz Heider and Mary-Ann Simmel. Heider and Simmel created a short cartoon animation in which a large triangle, a small triangle and a circle moved in and out of a box. When people watch this meaningless cartoon, they instantly create elaborate stories to explain what is going on. They might say, for instance, that the circle was in love with the little

(The Author)

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The Debunker's Dilemma



Over the years dozens of parapsychologists have claimed to have produced evidence of the existence of extrasensory perception. For science to move forward, however, other

experimenters must be able to replicate those results. Herein lies a problem: in the world of science publishing, original studies are often published, but failed replications are not, leaving readers with just one side of the story.

In 2010 parapsychologist Daryl J. Bem published in a high-profile psychology journal a series of experiments that seemed to support the existence of precognition. The paper describes several studies involving more than 1,000 participants. In one experiment, for example, participants were shown a list of words and then asked to recall as many words as possible. A few moments later they were shown a random selection of words from the original list. Spookily, the results revealed that the participants were better at recalling words that they later saw a second time. Their memory seemed to be affected by the words they would see in the future.

The following year I teamed up with psychologists Stuart Ritchie of the University of Edinburgh and Chris French of Goldsmiths, University of London, to attempt to reproduce Bem's controversial findings. We each ran our own independent study replicating the precognitive memory experiment. (Bem himself thought that it would be the easiest one in his series to reproduce.) Bem kindly provided us with the software he had used to run his study, and we did our best to duplicate his methods and setup. All our three studies obtained null results, suggesting that parapsychologists have yet to find the Holy Grail of a replicable effect.

When we submitted our results for publication, however, several journals refused to review our paper on the grounds that they did not publish attempted replications. We believe that such policies represent a real problem not just for parapsychology but for mainstream psychology, too. To verify that an effect is genuine, it is vital that other scientists attempt to replicate findings in their own laboratories and can publish the results of their work. By refusing to publish attempted replications, journals make it virtually impossible to assess a finding and so can leave both psychologists and the public with the mistaken impression that an effect is much more robust than is actually the case.

—R.W.

OUR SUPERB AGENCY-DETECTION SKILLS MIGHT EXPLAIN WHY MANY OF US BELIEVE IN GOD, GHOSTS AND GOBLINS—SOME PEOPLE MAY SEE CAUSAL LINKS MORE READILY THAN OTHERS.

triangle and that the big triangle was attempting to steal away the circle. But the little triangle fought back, and eventually it and the circle lived happily ever after. The experiment illustrated beautifully that almost everyone has the capacity to perceive intentions and purpose where none exists.

Our superb agency-detection skills might explain why so many of us believe in God, ghosts and goblins—perhaps some of us see causal connections more readily than others. If Barret is right, ghosts are the price we pay for having remarkable brains that can effortlessly figure out why other people behave the way they do.

Agency detection does not explain everything, of course—we also excel at discerning faces in arbitrary objects. In 2009 my colleagues and I teamed up with the Edinburgh International Science Festival to carry out a large-scale public experiment on the science of ghosts. Part of the project involved asking anyone who thought they had photographed a spirit to submit their image for examination. We received more than 1,000 pictures from around the world, none of which provided compelling evidence of the existence of spirits. Often we could not see the alleged apparition at all, even though the photographers insisted that the ghostly face was easy to spot hiding in the darkness, say, or in a

plume of smoke. For such phenomena, spooky photographs are the tamest examples, with some people claiming to see supernatural faces in the strangest places, including observing the likenesses of famous religious figures in all sorts of bread products. These individuals are most likely experiencing yet another case of normal brain processes going into overdrive.

Faces are vital to our survival, and several brain-scanning studies have revealed that significant chunks of the brain are dedicated to spotting and identifying visages. As with our strong pattern-recognition skills, the ability to identify faces has been refined through millions of years of evolution. Neglecting to notice an unfriendly mug could put you in serious danger. This phenomenon, called pareidolia, explains why the Internet is littered with photographs of plugs, cars and houses that appear to resemble human faces. Yet in the same way that the agency-detection device can spiral out of control and cause people to believe in ghosts and goblins, some people's face-recognition systems can become hyperactive and lead them to observe eyes and mouths everywhere.

Grand Theory of Paranormality

Although we are still in the early stages of learning which features of the brain cause us to form unscientific ideas, one in-

Humans are innately drawn to look at faces. Most of us will also see eyes and mouths in chipped paint and other arbitrary places. This cognitive tendency, among others, helps to explain why our brain can string together numerous otherworldly explanations for everyday events.



SISSE BRIMBERG Getty Images

teresting finding suggests a possible unifying theory for belief in ghosts, precognition, telepathy, and the like.

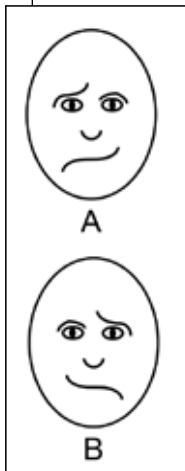
Numerous psychologists and neuroscientists have shown that despite our brain having two hemispheres, those two halves are actually surprisingly similar and capable of carrying out the same kinds of tasks. Still, each hemisphere does tend to specialize in certain ways of thinking. The left hemisphere is better at language, mathematics and logical thinking, among other things, whereas the right half excels at face recognition, certain aspects of creativity, visual imagery and music. Some psychologists think that people differ in the extent to which they rely on the two hemispheres, thus making them more experiential or rational in their preferred way of thinking about themselves and the world.

In a series of experiments that began in the late 1990s, neuropsychologist Peter Brugger of University Hospital Zurich noticed that many of the effects that cause people to think they have experienced paranormal phenomena are associated with the right hemisphere. For example, these individuals tend to value intuitive thinking over rationality and are especially good at perceiving faces where none exist. Brugger speculated that those who regularly undergo seemingly supernatural happenings might have a more dominating right hemisphere. For the past 10 years Brugger and his colleagues have been conducting a series of fascinating experiments to examine this somewhat contentious notion. Take a look at the figure at the left.

Which of the two images look happier? In drawing A the person is smiling on the right side of the face, and in drawing B the individual is smiling on the left side. We perceive visual information using the hemisphere opposite the eye that took it in, such that data from the left side of an image is fed to the right hemisphere, and

vice versa for the right side of the drawing. Some researchers have speculated that people with more dominant right hemispheres will be more influenced by their perception of the left side of the face and so be more likely to indicate that face B looks happier than face A. Other tests of this imbalance have involved trying to walk blindfolded down the middle of a corridor, a task during which right-dominant individuals tend to veer left. Psychologists have also asked people to mark the center of a line drawn on a piece of paper, which right-dominant subjects tend to place left of center, and to quickly guess what number lies halfway between 15 and 3, which typically generates lower estimates from right-dominant types.

Brugger has administered these types of tests to hundreds of subjects and also asked them to indicate the degree to which they believe in paranormal phenomena. Initial results have re-



COURTESY OF RICHARD WISEMAN University of Hertfordshire (faces); GETTY IMAGES (mirror)

How to See a Ghost

Stand about half a meter in front of a large mirror. Next, place a candle or other dim light directly behind yourself and turn off the lights. After gazing at your reflection for about a minute, you will start to experience a strange illusion. According to work conducted by Italian psychologist Giovanni B. Caputo of the University of Urbino, about 70 percent of people see their face become horribly distorted, and many individuals eventually see it contort into the face of another person. Although researchers are not sure what produces the weird effect, the lighting condition seems to prevent your brain from “binding” together the different features of your face into a single image. —R.W.



vealed that those individuals who have experienced the impossible do indeed tend to produce responses associated with being right-dominant. According to the theory, such people would be especially likely to make associations between unconnected events, see faces in ambiguous shapes and sense patterns where there are none. This inclination, in turn, makes them more likely to experience seemingly impossible phenomena such as seeing ghostly faces in photographs and having dreams that appear to come true. If future research continues to confirm his idea, Brugger may well be laying the groundwork for a unifying theory of paranormal belief.

Think of it this way. Almost all our physical and psychological traits vary along a continuum—certain people are tall, and others are short; some individuals are outgoing, whereas others are shy. Yet the great majority of us land somewhere in the middle, and the same goes for belief in the supernatural. **M**

(Further Reading)

- ◆ **SuperSense: Why We Believe in the Unbelievable.** Bruce Hood. HarperOne, 2009.
- ◆ **The Belief Instinct: The Psychology of Souls, Destiny, and the Meaning of Life.** Jesse Bering. W. W. Norton, 2011.
- ◆ **The Believing Brain: From Ghosts and Gods to Politics and Conspiracies—How We Construct Beliefs and Reinforce Them as Truths.** Michael Shermer. Times Books, 2011.
- ◆ **Paranormality: Why We See What Isn't There.** Richard Wiseman. Kindle edition. Spin Solutions, 2011.