paranormal psychologist

Why would a prominent researcher buck the establishment and embark on a quixotic mission to prove ESP exists?

by YUDHIJIT BHATTACHARJEE

ON A WINTER AFTERNOON LAST MARCH, DARYL BEM stepped out of the psychology department building at Cornell University, dressed in a red parka and a woolen hat to fend off the icy wind. As he walked along the pavement, navigating mounds of snow and taking care not to step onto the slushy street, the well-bundled social psychologist looked like a man who might prefer staying safe within the boundaries, a man who might shun risk—proving once again the danger of mistaking surface for substance. The 73-year-old Bem has defied the norm throughout his intellectual life, burning every dogma he's encountered in the pyre of his logic. Now, in the twilight of his career, he has committed what may be his most daring act of sacrilege: claiming the existence of precognition, the ability to sense future events. Maybe this time, his colleagues say, Daryl Bem has gone too far.

photography by SHANNON TAGGART

Psychologist Daryl Bem's lifelong interest in the tricks of professional mind readers has recently morphed into a scientific investigation of ESP.

Bem made his mark as a psychologist four decades ago by proposing the then radical idea that people adjust their emotions after observing their own behavior–that we sometimes develop our attitudes about our actions only after the fact. The proposition challenged the prevailing wisdom of the 1960s that things worked the other way around, that attitude was the engine from which behavior emerged. Though counterintuitive, Bem's theory has held up to scientific scrutiny in dozens of studies and is now enshrined in psychology textbooks.

Over the years, Bem cemented his reputation as a rebel by floating other controversial theories on topics such as personality and sexual orientation. His own personal life was also decidedly unconventional. Despite being married to a woman, Bem never hid from his family the fact that he is gay. A few years ago, he explained this conjugal conundrum in an Internet posting distinguishing between romantic love and sexual attraction, arguing that many individuals—like himself—fall in love with a person of the "wrong" gender.

Even in the context of a career of irreverence, there was little to suggest that Bem would end up defending the possibility of extrasensory perception, or ESP, which most mainstream scientists consider unworthy of serious inquiry. Through most of his career, he was as dubious about telepathy (mind reading) or precognition (seeing the future) as any of his colleagues.

Then data changed his mind.

In 2010 Bem published the results of nine experiments he had conducted over seven years that, in his view, constituted strong evidence of precognition. The paper, titled "Feeling the Future," came out in the *Journal of Personality and Social Psychology,* a peer-reviewed publication held in high esteem by psychologists. It drew a flurry of media attention, but Bem denies that he is being provocative for controversy's sake. "When someone holds up a common belief and says it is obvious, I say, well, let's reverse the thinking on that and see where it gets you," he says. Even if that reversal violates the rule that cause comes before effect.

TO THE EXTENT THAT THE PAST CAN PREDICT the future, Bem's early life was awash in hints of a restless mind. Growing up in Denver, he inherited a nonconformist streak from his mother, who delighted in the disapproving looks she would get as she rode a man's bike through the neighborhood. She went bowling in the 1930s when it wasn't considered respectable for women to hang out at bowling alleys, and she fought to include an African-American woman on her bowling team at a time when such a thing was unheard of. "I grew up knowing that being slightly out of step is fun," says Bem, who often smiles even when there is no obvious reason for mirth.

When Bem was 8, his aunt and uncle gave him a magic set and he was instantly hooked. Every Saturday he went to a magic shop in downtown Denver where a magician performed behind the counter. Bem began doing his own magic act at birthday parties, carrying his gear in a suitcase labeled Daryl the Great.

In high school he saw the vaudeville mentalist Joseph Dunninger on television, seeming to read minds. Searching through a pile of magic catalogs, Bem found an ad that read: "You too can do what Dunninger does. Send for this manuscript."

Soon Bem was performing mentalist tricks on stage, like guessing correctly what somebody in the audience had eaten for dinner the previous night, based on tangible clues that had nothing to do with psychic skill. What he particularly loved about mentalism was how convincingly magical it seemed. The audience was left wondering if there was something paranormal going on. "Maybe it's a trick—but you're not sure," he says.

Bem studied physics at Reed College in Portland, Oregon, and in 1960 went on to MIT for graduate work. At the time, MIT students were encouraged to take classes outside their major field of study. Most of the other physics students took math courses. Bem chose psychology, and the first class he took focused on race relations. What interested him most was an examination of segregation in the South. Government officials defending segregationist policies argued that it wasn't possible to change people's behavior without changing their hearts and minds first. Until whites felt more charitable toward blacks, the officials argued, there was no point in desegregating water fountains and other facilities. But studies in a number of Southern cities showed this was not true, Bem noticed. "When you did a survey asking if it would be OK to desegregate the schools, people were almost unanimously opposed," he says. "Then a court decision would come down; they did it, and then six weeks later the survey showed that people had changed their minds."

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Bem found it fascinating that empirical studies could expose societal myths. "At the end of the course, I went to the professor and asked, 'So, what kind of psychologist are you?' He said, 'I'm called a social psychologist.' I said, 'That's what I want to be when I grow up.'"

Bem applied to graduate programs in psychology and ended up at the University of Michigan. In one of his first experiments there, he studied the relationship between attitudes and behavior by seeing whether he could get children at a local school to like brown bread, which they avoided. He put half the kids through a weekend intervention in which they got a reward for saying they liked brown bread. The other students simply listened to a presentation of images of different foods along with a voice-over of Bem saying, when a picture of brown bread appeared on-screen, "You like brown bread."

To Bem's surprise, both groups increased their consumption of brown bread, and by a similar amount, the following week. "Somehow my saying to them, 'You like brown bread' was

And on the Other Side: The Reluctant Psi Slayer

Four years ago, a Harvard grad student in neuroscience named Sam Moulton was one of a handful of serious academics involved in ESP research, or psi. His interest in the field began in college when he read about the classic psi studies of Duke biologist J. B. Rhine, who died in 1980. "It blew my mind," he says, "that people were studying this stuff with the methods of science." Moulton spent a summer studying psi research techniques at Rhine's old lab. Then, at Harvard, he conducted experiments using functional magnetic resonance imaging (fMRI) to search for hard evidence of psi activity in the brain.

Moulton modeled his study on previous fMRI experiments that showed the brain reacts differently to new and old perceptions. When you see a photograph for the first time your brain explodes with activity, but on second viewing the brain reacts much less dramatically. After placing test subjects in a brain scanner, Moulton showed them images they had never seen before. But unbeknownst to them, he had already attempted to transmit the images to them by other means: In a nearby room, someone emotionally intimate with the subject stared at the images on a computer screen and tried to transmit them telepathically. He also showed the subjects the same images later on, to see if precognition affected the first viewing.

The experiment took Moulton in the opposite direction from Daryl Bem. All 19 subjects reacted the same way, as if the image they were seeing in the scanner was totally new to them. In 2008 Moulton and his advisor, psychologist Stephen Kosslyn, published the results in the *Journal of Cognitive Neuroscience.* "These findings," they wrote, "are the strongest evidence yet obtained against the existence of paranormal mental phenomena."

Despite the null results, Moulton thinks scientists should keep studying psi. "There should be people working on this crazy stuff," he says. "It probably doesn't exist, but man, if it does, it'll upend everything." Still, Moulton won't be one of those scientists. After publishing his paper, he took a job assessing teaching methods at Harvard. "I've given up," he says. "I tried as hard as I could to prove psi exists. And I didn't find a damn thing." PAT WALTERS

the same as their saying it to themselves," he explains. "The leap I made from that is, maybe as adults we rely more on observations and inference from stimuli and our own responses to decide what our internal states are." An example would be eating a second sandwich and then remarking to yourself, "I guess I was hungrier than I thought," or realizing only after biting your nails all day that "something must be bugging me."

By the end of the 1960s, the idea that behavior can be prelude to belief had gained enough support to make Bem a rising star, propelling him to a professorship at Carnegie Mellon University in Pittsburgh. There, and later at Stanford and Cornell, Bem would perform his mentalism show for his students on the last day of class. He would say he was testing them for evidence of ESP, and after an elaborate selection process he would pick out one who supposedly had the strongest ability. Bem would ask the student to visualize different aspects of his or her life, such as family and city of birth. He would then read the student's mind with uncanny accuracy, much to the class's disbelief.

In reality there was nothing spooky about Bem's performance. He knew in advance which student he was going to call on; the trick was simply to make the selection seem spontaneous. A day before the show, he would call the student's parents to quiz them about their child's life. When he revealed these details during the performance, students were left wondering if their professor really did possess ESP. "It was a pure swindle," Bem says with another smile. At the end of the show, he always revealed the truth. The experiment had nothing to do with ESP; the point was to demonstrate that the students shouldn't always trust their intuition.

One day a University of Pittsburgh researcher who was studying psi—an umbrella term for telepathy, precognition, and other seemingly paranormal phenomena—came to see Bem perform. Amused as he was by the show, he thought Bem was being unfair to psi. "He said, 'Daryl, I don't think you know the psi literature,'" Bem recalls. "So he sent me a bunch of stuff to read."

Bem was skeptical but fascinated. He learned that the systematic study of psi began in 1882, when scholars in the United Kingdom formed the Society for Psychical Research, promoting formal investigations into séances. (The society is still going strong.) Many scientific luminaries of the time, like Harvard psychologist William James and the Nobel-winning physicist Baron Rayleigh, unabashedly endorsed the study of the occult. At the turn of the century, the French power couple Marie and Pierre Curie–the discoverers of radium–attended séances conducted by Eusapia Palladino, at the time a well-known Italian medium.

In the early 1930s a Duke University botanist named Joseph B. Rhine began testing students for clairvoyance, the ability to see things hidden from sight, by making them guess the design printed on the back of a card pulled randomly from a stack. On average, the subjects guessed correctly some 28 percent of the time, significantly better than the 20 percent success rate that would be expected by chance. Over the next three decades, as Rhine conducted a series of lab experiments on psi, he injected more scientific rigor into the field and inspired a new generation of researchers to investigate ESP with well-designed experiments.

One of Rhine's protégés was Charles Honorton, who eventually started his own lab in Princeton, New Jersey. There he conducted telepathy experiments based on a now classic technique. In those tests, a subject, called the sender, sat in one room watching a video on a monitor. In a room close by, a second subject, the receiver, sat with eyes covered and headphones on in order to block out all conventional incoming stimuli. Thus ensconced, the receiver described the images running through his or her head. By comparing the descriptions of those images with the content of the video, Honorton tried to determine if the receiver was picking up any telepathic signals from the sender.

Intrigued as Bem was with this history of serious experiments, he did not give psi much further thought until 1985. By then a professor at Cornell, he performed his mentalism show at the Parapsychological Association's convention in Boston. Afterward, Bem received a letter from Honorton inviting him to visit Honorton's Princeton lab to scrutinize his experimental protocol. Honorton wanted to make sure his experiments would not be undermined by subjects who were gifted psi fakers like Bem.

Bem had seen Honorton debate the reality of psi with psychologist and prominent sceptic Ray Hyman and had been impressed by Honorton's performance. He decided to go examine Honorton's evidence for himself. Honorton, who had a reputation for being abrasive, gave Bem a warm reception and a rundown of

the protocol. Then he asked Bem to participate as receiver himself.

Soon Bem was led to a soundproof room, where he sat in a reclining chair with Ping-Pong ball halves covering his eyes and headphones delivering white noise. For the next half hour, as a sender in another room watched a one-minute clip on a TV monitor several times, he described the images that went through his mind. Later, shown four clips, including the one that the sender had watched, Bem ranked them in order of how closely they coincided with his own mental images.

Because he gave the second-highest rating to the clip the sender had watched, the trial didn't result in a "hit." But Bem was taken with the rigorous protocol. "This is quite sound," he told Honorton. He also made an offer: "If you get positive results, then I have one major talent, and that is getting published in mainstream journals."

Honorton continued to collect data until he had tested 240 participants, some more than once. He found that of the 329 individual sessions with these subjects, 32 percent produced a hit, significantly above the 25 percent that would be expected by chance alone. True to his word, Bem wrote up the results with Honorton in a paper they submitted to the peer-reviewed *Psychological Bulletin.* It was accepted days after Honorton died in 1994 and signaled the beginning of Bem's career as a serious researcher of psi.

I thought, my god, that is fascinating," Bem says of precognition, "because it means that our classical view of the physical world is wrong."

BY THE END OF THE 1990S, BEM HAD CHANGED his focus from clairvoyance to precognition, the most mind-boggling of psi phenomena. "It has the biggest wow factor," he says. Although telepathy, or straightforward mind reading, is hard to believe, at least it seems remotely scientifically possible. Electromagnetic waves travel over vast distances, so perhaps there is some way the electrical impulses that generate thoughts could be transmitted from one person to another. Precognition is different. Sensing events that have not yet occurred requires that information move backward in time. "I thought, my god, that is fascinating," Bem says, "because it means that our classical view of the physical world is wrong."

Bem gives out a manual on his psi experiments to any fellow psychologist who expresses a desire to replicate his studies.

So Bem devised a series of experiments to test precognition. In the simplest, subjects were asked to click on either of two curtains on a computer screen to find an erotic image hidden behind one of them. A computer program randomly assigned the image to one of the curtains only *after* the subjects had made their choice. Bem found the subjects chose correctly 53.2 percent of the time, notably higher than chance.

Another test was a flipped version of a memory experiment, a reversal of cause and effect. In the standard experiment, subjects see a list of words on a computer screen. Then they are shown another list containing half of those original words and are asked to type them. In the last step, all the words disappear from the screen, and the subjects are asked to type all the words they can recall from the full list. Not surprisingly, subjects do better at recalling words that they typed in the interim step.

In Bem's version of the experiment, the subjects were first asked to type all the words they could recall from a list of 48 words shown on the screen. Then they were presented with half the words from the full list and asked to type them. Bem found the subjects were better at recalling the words in the first round that they would later be asked to type again in the second round. That is, the memory-reinforcing effect of typing the words seemed to work backward in time.

Yet another Bem experiment played with a phenomenon called priming. In a typical priming test, subjects are flashed a positive or negative word, such as *beautiful* or *ugly,* before being shown an image that they must judge pleasant or unpleasant. Studies show that subjects respond more quickly when the word and the image are congruous—that is, if both are pleasant or unpleasant. In Bem's reversal of the procedure, the word was flashed after the subjects had judged the picture, yet the results were the same.

Bem ran five experiments on precognition (four of them twice), all variations of his priming and reversal design, testing more than 1,000 subjects. The positive effect detected in the studies was small—only about 3 percent greater than chance—but statistically significant nonetheless. A roulette wheel at a casino has a similar edge over players, in that the casino wins 53 percent and players 47 percent of the time. "And casinos are not complaining that that is too small," says Bem. "They are making plenty of money with that edge."

WHEN BEM'S PAPER WAS ACCEPTED BY THE *JOURNAL OF PERSONALITY and Social Psychology*, a hailstorm of criticism erupted in the normally measured field. Ray Hyman, by now an emeritus professor of psychology at the University of Oregon, denounced the work as "an embarrassment." Some of Bem's colleagues were impressed by the paper's elegance and rigor but were still unwilling to take its claim seriously. "These are the best ESP studies I've ever heard of, and they make clever use of paradigms used in mainstream psychology," says Tom Gilovich, the former chair of Cornell's psychology department. "But I don't believe the conclusions even for a second."

The most extensive critique came from Eric-Jan Wagenmakers, a mathematical psychologist at the University of Amsterdam, who believes that Bem's findings reveal fundamental problems in how statistics are applied to test ideas. In classical statistics, scientists evaluate whether their data fit the null hypothesis, in

which a statement is negated or disproved. Specifically, Bem analyzed whether the results of his studies could be explained if precognition did not exist. The analysis found the odds of getting all of those results in a world without precognition, due to chance alone, were "one in about 74 billion," according to Bem.

With this impressive-sounding result, Bem ruled out the null hypothesis, that precognition does not exist. Following the standard rules of hypothesis testing, he concluded that the alternate hypothesis—the reality of precognition—must therefore be valid.

Wagenmakers thinks this kind of analysis is misleading whenever it is applied in the social sciences, however, and especially when applied to an extraordinary claim like the existence of ESP. "Evidence is a relative concept, and although some data may be unlikely under one hypothesis, this does not mean that therefore we should accept the other," Wagenmakers says. He analyzed Bem's data using a different system, called Bayesian statistics, which compares how well data might fit both the null and the alternate hypothesis. In this analysis, Bem's psi effect was no longer evident.

Bem quickly teamed up with two experts on Bayesian statistics and did his own Bayesian analysis of the data, which showed the psi effect was still intact. The problem with the rival analysis, Bem claims, was that Wagenmakers set a very high bar for how strong the psi effect had to be to meet the Bayesian test.

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BEM HIMSELF HAS NEVER EXPERIENCED ANYTHING EXTRASENSORY, nor has he had any spiritual awakenings that might predispose him to belief in the paranormal. But just because psi lacks an obvious scientific explanation does not mean it does not exist, he argues, adding that the history of science is replete with examples of phenomena like electromagnetism that went unexplained for decades or centuries after they were discovered.

Psi proponents say that an explanation for ESP (like the ultimate explanation for electromagnetism, incidentally) may come from quantum physics. The science they usually invoke is quantum entanglement, the bizarre relationship that arises between two particles like electrons or photons that have interacted with each other. Even when the particles are separated by great distances, the act of measuring the properties of one—spin, for instance, if the particle is an electron—immediately impacts the properties of the other. Albert Einstein, who doubted whether entanglement was possible, famously derided the idea as "spooky action at a distance." But entanglement is now accepted as an observable fact, if only in the realm of the very small.

Dean Radin, an electrical engineer who worked at Bell Labs before devoting himself full-time to the study of psi, has hypothesized how entanglement might lead to telepathy and clairvoyance. He suggests that the matter we are composed of, including the synaptic fluid between our neurons, is entangled with the universe at large, allowing for the anomalous transfer of information across great distances, such that somebody might dream of an airplane crash at the instant the airplane is going down.

To explain precognition, Radin proposes a different but related concept: time-symmetry of quantum events. This is the idea that microscopic phenomena, such as the motion of an electron through an electromagnetic field, would look the same regardless of whether time were flowing forward or backward. On large scales such time symmetry falls apart (which is why it is not possible to uncrack an egg), but some psi proponents think it may apply sufficiently to allow the reversal of cause and effect, enabling precognition.

Mainstream physicists recoil at these ideas. Anton Zeilinger, a quantum physicist at the University of Vienna, finds the suggested link between psi and quantum physics a "misuse" of the latter. "That sounds to me like saying we don't understand this basic psychological phenomenon, we don't understand quantum mechanics, therefore the two must be related," he says.

Extraordinary claims require extraordinary evidence, and Bem's findings must be well confirmed by other researchers before they will accept them as true. Electromagnetism works the same way every time. But so far, nobody who has attempted to reproduce Bem's findings has published positive results. Marketing professors Leif Nelson at U.C. Berkeley and Carnegie Mellon University's Jeff Galak failed to get positive results from a replication of the test involving erotic images, and experimental psychologist Richard Wiseman of the University of Hertfordshire in England failed to reproduce the outcome of the word recall test. Bem responds that there were flaws in both efforts.

Meanwhile, Bem's in-box has been flooded with colorful information that he, unfortunately, cannot put to any scientific use. "Half the emails I get are people telling me their personal experiences of precognition," he says. Some are predictions from individuals about things like "what will happen in Libya." Others are from people "who claim they wake up whenever somebody distant in their family is ill."

Bem describes these anecdotes matter-of-factly, without commenting on whether he believes any of them. When asked how he would feel if other scientists were to clearly disprove his claim about precognition, the gleam fades from his eye for a brief second. "Then I guess I could decide it was a fluke," he says. "Science is self-correcting. Reality always bites back."

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