Hypnosis Works

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The power of trance can no longer be disputed, a psychiatrist at Stanford University says. Now we just have to use it

by Michael Abrams, Photography by Dan Winters

On one, I want you to do

one thing: Look up.

On two, do two things:

Slowly close your eyes and take

a deep breath.

On three, do three things:

Breathe out, relax your eyes, and

let your body float.

Imagine you are floating in

a bath, a lake, a hot tub,

or just floating in space.

Each breath is getting

deeper and easier . . .

The patient is 80 years old. She is lying under the bright lights of an operating room at Harvard's Beth Israel Deaconess Medical Center, where radiologist Elvira Lang is about to thread a catheter through her arteries. The tiny tube will work its way to one of the woman's kidneys, where it will block the organ's blood supply. A surgeon is scheduled to remove the kidney the next day. Embolizing the kidney will help keep the operation simple, safe, and tidy. But the woman is running a fever, and her kidney may be infected. Because she ate earlier in the day, she can't be given a sedative. What should have been a routine procedure has become an ordeal.

"This is your safe and pleasant place to be," one of Lang's associates reads from a laminated card. "You can use it in a sense to play a trick on the doctors. Your body has to be here, but you don't."

Lang is one of a growing number of hospital physicians who use hypnosis in addition to anesthesia. Together with David Spiegel, a professor of psychiatry at Stanford University School of Medicine, she has conducted extensive studies of hypnosis in the operating room, often with dramatic results. Hypnosis and interventional radiology interest Lang for the same reason: Both are ways of making a visit to the hospital less horrific. A tiny incision is all that's required. By threading a stent into an artery, for example, Lang can help her patients avoid far more invasive surgery. "I'm your medical plumber," she says. By adding hypnosis, she can make an operation shorter, less painful, and less dependent on drugs. The hardest part of the procedure is getting other doctors to accept it.

Brain scans have shown that a hypnotized patient like Zoraida Smith, 83, can't tell the difference between reality and an image that has been planted in her mind. Smith is being treated with hypnosis for chronic fatigue.

Over the years, a number of rigorously controlled studies have proved that hypnosis reduces pain, controls blood pressure, and can even make warts go away. But because very few studies have attempted to find out how it works, most scientists are skeptical of its power. Critics suggest hypnosis is no different from the placebo effect. They both use the power of suggestion to get the mind to heal the body; both are no substitute for medicine.

That skepticism has driven Spiegel and other researchers to take a hard look at what happens in the brain during hypnosis. Trance, they've found, opens a window onto the nature of the imagination. Through it, we are beginning to glimpse how the mind distinguishes daydreams from reality.

Spiegel is a second-generation hypnotist. His father, Herbert Spiegel, is a psychiatrist who first used hypnosis as a battlefield surgeon in World War II. In 1943 he even used the technique on himself when he was struck by a mortar from a German tank in Mateur, Tunisia. A steel shell fragment protruded from his ankle, but he managed to tune out the pain.

Soon after returning home, Spiegel was hired as a professor of combat psychiatry at the School of Military Psychiatry at Mason General Hospital in Brentwood, New York. There, he treated hundreds of returning veterans with hypnosis, becoming ever more convinced of its effectiveness. At the same time, the first clinical studies of hypnosis began to appear. In 1961 psychiatrist Ralph August published a study of 850 women who gave birth under hypnosis. Only 4 percent—34 women—required painkillers. Other studies found that hypnotized subjects could resist intense pain for a full minute longer than those who weren't hypnotized, and for 30 seconds longer than those who had been given a placebo painkiller.

By the 1960s, Spiegel was teaching clinical hypnosis at Columbia University, and his son was among his students. David Spiegel went on to attend medical school at Harvard and to specialize in psychiatry and clinical hypnosis as his father had. In 1978 the two Spiegels coauthored the standard textbook in the field: *Trance and Treatment: Clinical Uses of Hypnosis*.

Now 58, David Spiegel is tall and a bit disheveled, with his father's oval face and serene features. He speaks in complex but reasoned sentences and listens with the stoic patience of a man who has faced many disbelievers. "Hypnosis has been controversial since the beginning," he says. "The thing is, it just won't go away. There's so much about the phenomenon that's interesting." Among researchers in the field, Spiegel says, there are two schools of thought and a growing chasm between them. One school claims that hypnosis fundamentally alters a subject's state of mind; the other believes that hypnosis is simply a matter of suggestibility and relaxation. Spiegel belongs to the first school, and over the years he has had a running debate with two scientists on the other side: Irving Kirsch, a psychologist at the University of Connecticut at Storrs, and Stephen Kosslyn, a professor of psychology at Harvard.

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Kirsch often uses hypnosis in his practice, and he doesn't deny that it can be effective. "With hypnosis you do put people in altered states," he says. "But you don't need a trance to do it." He likes to illustrate the point with an ancient talisman of the hypnotic trade: the pocket watch hanging on a chain. Put your elbow on a table, he says, holding the chain between your thumb and forefinger, and let the weight swing freely. Now, keeping your hand as steady as possible, imagine that the pendulum is moving back and forth parallel to your chest. "Just focus on it moving in that direction. Side to side," he says. "Ignore everything else and imagine it going side to side at its own rhythm." Once it's swaying that way, and it inevitably will, imagine it swinging another way—clockwise, say, or toward you—just to prove to yourself that it's not a coincidence. Once again, the weight will obey your mind. This little trick works on even the most skeptical and unhypnotizable of people. You don't have to enter a trance for your subconscious and your body—in this case, the tiny muscles in your fingers—to respond to a suggestion. "I could have hypnotized you and done the same thing, but it wouldn't have been a result of the hypnosis," Kirsch says. "It would have been a result of your focusing on moving it in a particular direction."

Psychiatrist David Spiegel has Zoraida Smith roll back her eyes to test her hypnotizability. "Hypnosis is poised between two sacred cows," he says, "that the body is a machine and that we are individuals."

Spiegel disagrees. One of his best-known studies found that when subjects were hypnotized and given suggestions, their brain-wave patterns changed. He admits that suggestion alone is a powerful tool but believes that hypnosis magnifies its effects. In another of Spiegel's studies, people under hypnosis were told their forearms were numb, then given light electrical shocks to the wrists. They didn't flinch or respond in any way, and their brain waves resembled those of people who experienced a much weaker shock.

To Kirsch, this still wasn't enough to prove the power of trance, but Stephen Kosslyn was willing to be convinced. Kosslyn is an exceedingly polite man, with a gray, philosophical beard and perpetually raised eyebrows. The hypnosis literature is rife with examples of subjects aping what they believe is hypnotic behavior, he says. Such "demand effects" are exactly what make placebos so effective. As for the brain-wave study, other events in the lab—such as interaction with the investigators—could have caused the shift in the subjects' state of mind. "Is it just playacting?" Kosslyn wondered, when he first saw Spiegel's data. "Or is there something really going on in the brain?"

To find out, Spiegel and Kosslyn decided to collaborate on a study, focusing on a part of the brain that is well understood: the fusiform circuit. Located on the occipital lobe, the circuit has been found to process the perception of color. Neuroscientists zeroed in on it by placing subjects in a positron-emission tomography (PET) scanner to measure blood flow in the brain, then having them look at cards with color rectangles. Spiegel and Kosslyn wanted to see if subjects could set off the same circuit by visualizing color while under hypnosis.

The first step was to find the right study subjects. Only a small fraction of the population—known as highs in hypnotic circles—can enter a deep trance, just as only a few people cannot be hypnotized at all. The rest of us fall on a spectrum in between. (See "Can You Be Hypnotized?" page 60.) Spiegel and Kosslyn selected eight people from a pool of around 120 subjects, then Kosslyn's team ran the experiment at Massachusetts General Hospital in Boston. As in the previous studies, subjects were put inside a PET scanner, shown a slide with color rectangles, and their brain activity was mapped. Then they were shown a black-and-white slide and told to imagine its having a color. Both tasks were repeated while under hypnosis.

The results, published in the *American Journal of Psychiatry* in 2000, were striking. When the subjects truly saw the color rectangles, the fusiform circuit lit up on both sides of their brain; when they had to imagine the color, the circuit only lit up in the right hemisphere. Under hypnosis, though, both sides of the brain became active—just as in regular sight. Under hypnosis, imagination seemed to take on the quality of a hallucination.

After the experiment, Kosslyn's raised eyebrows, for once, came down. "I'm absolutely convinced now that hypnosis can boost what mental imagery does," he says. "It sort of gives it a shot of vitamin A or something." But Kirsch remains skeptical. The color experiments demonstrate that people "are really experiencing the effects of hypnotic suggestion," Kirsch says, but not necessarily that they enter a trance. The subjects were told to see the card in color when they were hypnotized but only to *imagine* it in color when they weren't, Kirsch points out. "Being told to pretend that you're having the experience is a very different thing than the suggestion to have the experience."

"Technically, he's right," Kosslyn says. Because the eight subjects were all highly hypnotizable—or at least highly suggestible—Kosslyn and Spiegel were afraid that if the subjects were told to see the color, just as they had been when hypnotized, they would slip into a trance. Kosslyn doubts that changing the wording would have made a difference. "The hypnotized people would tell you that they could literally see. 'Lows' couldn't even do the task. They simply couldn't do it."

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To Kosslyn, the hypnosis study shows how the brain distinguishes between imagination and perception. The right side of the brain processes specific examples of things, while the left side processes more general concepts and categories. The left side knows that Spot is a dog, for instance, while the right side knows that the dog is Spot. That's why the right side of the brain lights up when we imagine a particular color, but the left side is left cold: The details of the daydream may seem real, but they don't apply to a larger reality.

"The realms of imagination and perception are not entirely distinct," Spiegel says. "This goes back to philosophers as far as Kant. What we take as reality is our processing of perceptual input." We make assumptions about what's real from small cues that are far from the complete picture. If you

are expecting to meet a friend at a restaurant and a stranger comes in with the same jacket and hair, you might call out your friend's name, but as soon as you see his face your mistake will be obvious. "Rather than passively accepting perception, we set up a competition between imagination and perception," Spiegel says. "Imagination can alter perception—in a sense it always does. But we're not aware of it." Under hypnosis, that distinction breaks down.

Kosslyn believes that hypnosis allows the body to tap into hidden reserves. He compares its effect to that of breaking a world record in sports: It changes our sense of the possible. "For years and years and years, no one could run a mile under four minutes," he says. "It was like the sound barrier—people thought that limbs would start falling off." Yet only six weeks after the record was finally broken, by British runner Roger Bannister in 1954, it was broken again by another runner. "Nowadays 40-year-olds can do it." Hypnosis may have the same effect, Kosslyn says. "It shifts what I call the assumed norm. It can play the part that Roger Bannister did in the four-minute mile."

Spiegel is a clinician first and a scientist second. The whys of hypnosis aren't as important, he believes, as that doctors recognize its power and start to use it. To that end, he and Lang have put the technique to the test in the operating room, just as he and Kosslyn did in the PET scanner. Seven years ago, Spiegel and Lang took 241 patients slated for vascular or kidney surgery and divided them into three groups. One group received standard care; another received standard care with an "empathic care provider"; and the third received standard care, an empathic care provider, and hypnosis. During the operation, the patients lay with their heads behind an opaque, soundproof barrier, so surgeons couldn't tell what care they were receiving. Every 15 minutes, the patients were asked to rate their level of anxiety and pain. They were also hooked up to an IV and given as much painkilling medication as they wanted.

The results of the study were published in *The Lancet*. On average, Spiegel and Lang found, the hypnotized subjects used less medication, experienced less pain, and felt far less anxiety than the other two groups. Patients who weren't hypnotized felt more pain over time regardless of how much medication they received; those who were hypnotized stayed equally comfortable throughout the surgery. Operations on hypnotized patients averaged 17 minutes shorter than those of other patients, and the cost of a standard radiological procedure fell from $638 to $300.

Lang has since bolstered those findings with two other ongoing studies, involving more than 330 patients. Once again, the hypnotized patients used less medication, recovered faster, and spent less time in the hospital than those with standard care.

Lang doesn't test her patients to see if they are highly hypnotizable. The more anxious they are about a procedure, she says, the more likely they are to benefit from hypnosis. "A person with a worst-case scenario about what's going to happen is somebody that has good imagery potential. It takes a very vivid mind to do that." Studies have shown that phobic people tend to be highly hypnotizable. Lang believes that people slip in and out of trances daily—that everyone has such moments of utter absorption when they can't hear what others are saying to them. "The ability to tune out is practiced throughout the world. Particularly in married couples," she says. Learning to control that absorption offers a way to learn to control pain.

The kidney operation Lang performed that day at Harvard was a good example. The 80-year-old patient came out of her trance at one point—"What is this rubbish about the beach?" she said—but the doctors soon put her under again with a simple hypnotic suggestion: "Your eyes won't close until your inner mind gives you permission." If hypnosis is ever to work its way into the mainstream, physicians will need to overcome their reluctance to say such things, knowing there is solid science behind what sounds like mysticism. "I think it should be based on data, not on belief," Spiegel says. "But in the end it doesn't matter why it works."

Can You Be Hypnotized?

In the 1960s, Herbert Spiegel developed one of the first tests of hypnotizability, known as the Hypnotic Induction Profile. The test has two parts. First, the subject is told to look upward. On a scale of zero to four, the more the whites of his eyes show, the more easily he can be hypnotized. Studies have yet to confirm this correlation, but many practicing hypnotists rely on it. Next, the subject is told to imagine that his left hand is a balloon floating toward the ceiling. Once again, the hypnotist rates his reaction from zero to four. Subjects rated zero keep their hands firmly planted on the chair. Those rated four feel their hand suddenly grow lighter and lighter until it lifts into the air.

Hypnotists often also give their subjects a personality survey. Here are a few sample questions. The answers in red are those that highly hypnotizable subjects tend to give.

HYPNOTIC INDUCTION PROFILE PERSONALITY QUESTIONNAIRE

This version is from www.webhome.idirect.com/~kehamilt/psyhypno.html.

1. As you concentrate on watching a movie or a play, do you get so absorbed in what is going on that you lose awareness of where you are?

a) Yes

b) No

c) Depends on situation

If so, do you ever get so absorbed that when the curtain comes down you are surprised to realize you are sitting in a theater?

a) Yes

b) No

c) Depends on situation

2. In general, as you perceive time, where do you focus more of your attention?

a) Past

b) Present

c) Future

d) All three equally

3. The French philosopher Blaise Pascal once said, “The heart has a mind which the brain does not understand.” He said there are two kinds of minds: the heart-mind and the brain-mind. Which of these do you give priority to?

a) Brain-mind

b) Heart-mind

4. How do you relate to another person?

a) Prefer to control the interaction

b) Prefer to let the other person take over as he or she wishes

c) Depends on situation

5. Regarding your tendency to trust other people, where on average would you place yourself on a scale?

a) Above average

b) Below average

6. How do you tend to learn something new?

a) Judge it critically at the time you are learning it

b) Accept it and perhaps judge it critically at a later time

7. Sensing your responsibility for what you do, where do you place yourself on a scale?

a) Above average

b) Average

c) Below average

8. If you are learning something new and you know in advance that it’s of such a nature that you can learn it clearly, safely, and equally well using either sense below, how would you prefer to learn it?

a) Through touch

b) Through sight

9. When you come up with a new idea, there are two parts to it: One is to dream it up and the other is to figure out how to do it. Of these two parts, which gives you a greater sense of fulfillment?

a) Dreaming it up

b) Figuring out how to do it

10. As you come up with or work out a new idea, which is more necessary?

a) Writing notes

b) Feeling your way through without writing

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