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The Truth and the Hype of Hypnosis

Though often denigrated as fakery or wishful thinking, hypnosis has been shown to be a real phenomenon with a variety of therapeutic uses--especially in controlling pain

By Michael R. Nash and Grant Benham

"You are getting sleepy. Verrry sleepy..." A waistcoated man swings his pocket watch back and forth before the face of a young woman seated in a Victorian-era parlor. She fixes her gaze on the watch, tracking its pendular motion with her eyes. Moments later she is slumped in her chair, eyes closed, answering the hypnotist's questions in a zombie-like mono-tone.

Everyone has seen a depiction of hypnosis similar to this one in movies and on television. Indeed, say the word "hypnosis," and many people immediately think of pocket watches. But it is now much more common for hypnotists simply to ask a subject to stare at a small, stationary object--such as a colored thumb-tack on a blank wall--during the "induction patter," which usually consists of soothing words about relaxation and suggestions to concentrate.

But is hypnosis a real phenomenon? If so, what is it useful for? Over the past few years, researchers have found that hypnotized individuals actively respond to suggestions even though they sometimes perceive the dramatic changes in thought and behavior they experience as happening "by themselves." During hypnosis, it is as though the brain temporarily suspends its attempts to authenticate incoming sensory information. Some people are more hypnotizable than others, although scientists still don't know why. Nevertheless, hypnosis is finding medical uses in controlling chronic pain, countering anxiety and even--in combination with conventional operating-room procedures--helping patients to recover more quickly from outpatient surgery.

Hypnosis can boost the effectiveness of psychotherapy for obesity, insomnia and anxiety.

Only in the past 40 years have scientists been equipped with instruments and methods for discerning the facts of hypnosis from exaggerated claims. But the study of hypnotic phenomena is now squarely in the domain of normal cognitive science, with papers on hypnosis published in some of the most selective scientific and medical journals. Of course, spectacles such as "stage hypnosis" for entertainment purposes have not disappeared. But the new findings reveal how, when used properly, the power of hypnotic suggestion can alter cognitive processes as diverse as memory and pain perception.

Wheat from the Chaff

To study any phenomenon properly, researchers must first have a way to measure it. In the case of hypnosis, that yardstick is the Stanford Hypnotic Susceptibility Scales. The Stanford scales, as they are often called, were devised in the late 1950s by Stanford University psychologists André M. Weitzenhoffer and Ernest R. Hilgard and are still used today to determine the extent to which a subject responds to hypnosis. One version of the Stanford scales, for instance, consists of a series of 12 activities--such as holding one's arm outstretched or sniffing the contents of a bottle--that test the

depth of the hypnotic state. In the first instance, individuals are told that they are holding a very heavy ball, and they are scored as "passing" that suggestion if their arm sags under the imagined weight. In the second case, subjects are told that they have no sense of smell, and then a vial of ammonia is waved under their nose. If they have no reaction, they are deemed very responsive to hypnosis; if they grimace and recoil, they are not.

Scoring on the Stanford scales ranges from 0, for individuals who do not respond to any of the hypnotic suggestions, to 12, for those who pass all of them. Most people score in the middle range (between 5 and 7); 95 percent of the population receives a score of at least 1.

What Hypnosis Is

Based on studies using the Stanford scales, researchers with very different theoretical perspectives now agree on several fundamental principles of hypnosis. The first is that a person's ability to respond to hypnosis is remarkably stable during adulthood. In perhaps the most compelling illustration of this tenet, a study showed that when retested, Hilgard's original subjects had roughly the same scores on the Stanford scales as they did 10, 15 or 25 years earlier. Studies have shown that an individual's Stanford score remains as consistent over time as his or her IQ score--if not more so. In addition, evidence indicates that hypnotic responsiveness may have a hereditary component: identical twins are more likely than same-sex fraternal twins to have similar Stanford scores.

A person's responsiveness to hypnosis also remains fairly consistent regardless of the characteristics of the hypnotist: the practitioner's gender, age and experience have little or no effect on a subject's ability to be hypnotized. Similarly, the success of hypnosis does not depend on whether a subject is highly motivated or especially willing. A very responsive subject will become hypnotized under a variety of experimental conditions and therapeutic settings, whereas a less susceptible person will not, despite his or her sincere efforts. (Negative attitudes and expectations can, however, interfere with hypnosis.)

Studies have also shown that hypnotizability is unrelated to personality characteristics such as gullibility, hysteria, psychopathology, trust, aggressiveness, submissiveness or imagination. Nor are highly hypnotizable individuals any more responsive than others to social influences such as misleading questions or peer pressure. The trait has, however, been linked tantalizingly with a person's ability to become absorbed in activities such as reading, listening to music or daydreaming.

Indeed, a highly hypnotizable person's capacity for effortless absorption might in part be determined by brain morphology. In 2004 James E. Horton of the University of Virginia's College at Wise and Helen J. Crawford of Virginia Polytechnic Institute and State University showed with MRI images that the rostrum part of the corpus callosum was 32 percent larger for highly hypnotizable subjects than for subjects who were not susceptible to hypnosis. This brain region plays a role in allocating attention and in the inhibition of unwanted stimuli.

Under hypnosis, subjects do not behave as passive automatons but instead are active problem solvers who incorporate their moral and cultural ideas into their behavior while remaining exquisitely responsive to the expectations expressed by the experimenter. Nevertheless, the subject does not experience hypnotically suggested behavior as something that is actively achieved. To the contrary, it is typically deemed as effortless--as something that just happens. People who have been hypnotized often say things like "My hand became heavy and moved down by itself" or "Suddenly I found myself feeling no pain."

Many researchers now believe that these types of disconnections are at the heart of hypnosis. In response to suggestion, subjects make movements without conscious intent, fail to detect exceedingly painful stimulation or temporarily forget a familiar fact. Of course, these kinds of things also happen outside hyp-nosis--occasionally in day-to-day life and more dramatically in certain psychiatric and neurological disorders.

Using hypnosis, scientists have temporarily created hallucinations, compulsions, certain types of memory loss, false memories, and delusions in the laboratory so that these phenomena can be studied in a controlled environment.

What Hypnosis Isn't

As scientists discover more about hypnosis, they are also uncovering evidence that counters some of the skepticism about the technique. One such objection is that hypnosis is simply a matter of having an especially vivid imagination. In fact, this does not seem to be the case. Many imaginative people are not good hypnotic subjects, and no relation between the two abilities has surfaced.

The imagination charge stems from the fact that many people who are hypnotizable can be led to experience compellingly realistic auditory and visual hallucinations. But an elegant study using positron emission tomography (PET), which indirectly measures metabolism, has shown that different regions of the brain are activated when a subject is asked to imagine a sound than when he or she is hallucinating under hypnosis.

In 1998 Henry Szechtman of McMaster University in Ontario and his co-workers used PET to image the brain activity of hypnotized subjects who were invited to imagine a scenario and who then experienced a hallucination. The researchers noted that an auditory hallucination and the act of imagining a sound are both self-generated and that, like real hearing, a hallucination is experienced as coming from an external source. By monitoring regional blood flow in areas activated during both hearing and auditory hallucination but not during simple imag-ining, the investigators sought to determine where in the brain a hallucinated sound is mistakenly "tagged" as authentic and originating in the outside world.

Szechtman and his colleagues imaged the brain activity of eight very hypnotizable subjects who had been prescreened for their ability to hallucinate while hypnotized. During the session, the subjects were under hypnosis and lay in the PET scanner with their eyes covered. Their brain activity was monitored under four conditions: at rest; while hearing an audiotape of a voice saying, "The man did not speak often, but when he did, it was worth hearing what he had to say"; while imagining hearing the voice again; and during the auditory hallucination they experienced after being told that the tape was playing once more, although it was not.

The tests showed that a region of the brain called the right anterior cingulate cortex was just as active while the volunteers were hallucinating as it was while they were actually hearing the stimulus. In contrast, that brain area was not active while the subjects were imagining that they heard the stimulus. Somehow hypnosis had tricked this area of the brain into registering the hallucinated voice as real.

Another objection raised by critics of hypnosis concerns its ability to blunt pain. Skeptics have argued that this effect results from either simple relaxation or a placebo response. But a number of experiments have ruled out these explanations. In a classic 1969 report, Thomas H. McGlashan and his colleagues at the University of Pennsylvania found that for poorly hypnotizable people, hypnosis was as effective in reducing pain as a sugar pill that the subjects had been told was a powerful painkiller. But highly hypnotizable subjects benefited three times more from hypnosis than from the placebo. In another study, in 1976, Hilgard and Stanford colleague Éva I. Bányai observed that subjects who were vigorously riding stationary bicycles were just as responsive to hypnotic suggestions as when they were hypnotized in a relaxing setting.

In 1997 Pierre Rainville of the University of Montreal and his colleagues set out to determine which brain structures are involved in pain relief during hypnosis. They attempted to locate the brain structures associated with the suffering component of pain, as distinct from its sensory aspects. Using PET, the scientists found that hypnosis reduced the activity of the anterior cingulate cortex--an area involved in pain--but did not affect the activity of the somatosensory cortex, where the sensations of pain are processed.

Despite these findings, however, the mechanisms underlying hypnotic pain relief are still poorly understood. The model favored by most researchers is that the analgesic effect of hypnosis occurs in higher brain centers than those involved in registering the painful sensation. This would account for the fact that most autonomic responses that routinely accompany pain--such as increased heart rate--are relatively unaffected by hypnotic suggestions of analgesia.

But couldn't people merely be faking that they had been hypnotized? Two key studies have put such suspicions to rest.

In a cunning 1971 experiment dubbed the Disappearing Hypnotist, Frederick Evans and Martin T. Orne of the University of Pennsylvania compared the reactions of two groups of subjects: one made up of people they knew to be truly hypnotizable and another of individuals they told to pretend to be hypnotized. An experimenter who did not know which group was which conducted a routine hypnotic procedure that was suddenly interrupted by a bogus power failure. When the experimenter left the room to investigate the situation, the pretending subjects immediately stopped faking: they opened their eyes, looked around the room and in all respects dropped the pretense. The real hypnotic subjects, however, slowly and with some difficulty terminated hypnosis by themselves.

Fakers also tend to overplay their role. When subjects are given suggestions to forget certain aspects of the hypnosis session, their claims not to remember are sometimes suspiciously pervasive and absolute, for instance, or they report odd experiences that are rarely, if ever, recounted by real subjects. Taru Mustonen, now at the Harvard School of Dental Medicine, Harold S. Zamansky of Northeastern University and their co-workers have exposed fakers using traditional lie detector tests. They have found that when real hypnotic subjects answer questions under hypnosis, their physiological reactions generally meet the criteria for truthfulness, whereas those of simulators do not.

Hypnosis and Memory

Perhaps nowhere has hypnosis engendered more controversy than over the issue of "recovered" memory. Cognitive science has established that people are fairly adept at discerning whether an event actually occurred or whether they only imagined it. But under some circumstances, we falter. We can come to believe (or can be led to believe) that something happened to us when, in fact, it did not. One of the key cues humans appear to use in making the distinction between reality and imagination is the experience of effort. Apparently, at the time of encoding a memory, a "tag" cues us as to the amount of effort we expended: if the event is tagged as having involved a good deal of mental effort on our part, we tend to interpret it as something we imagined. If it is tagged as having involved relatively little mental effort, we tend to interpret it as something that actually happened to us. Given that the calling card of hypnosis is precisely the feeling of effortlessness, we can see why hypnotized people can so easily mistake an imagined past event for something that happened long ago. Hence, something that is merely imagined can become ingrained as an episode in our life story.

A host of studies verify this effect. Readily hypnotized subjects, for instance, can routinely be led to produce detailed and dramatic accounts of their first few months of life even though those events did not in fact occur and even though adults simply do not have the capacity to remember early infancy. Similarly, when given suggestions to regress to childhood, highly hypnotizable subjects behave in a roughly childlike manner, are often quite emotional and may later insist that they were genuinely reliving childhood. But research confirms that these responses are in no way authentically childlike--not in speech, behavior, emotion, perception, vocabulary or thought patterns. These performances are no more childlike than those of adults playacting as children. In short, nothing about hypnosis enables a subject to transcend the fundamental nature and limitations of human memory. It does not allow someone to exhume memories that are

What It's Good For

So what are the medical benefits of hypnosis? A 1996 National Institutes of Health technology assessment panel judged hypnosis to be an effective intervention for alleviating pain from cancer and

other chronic conditions. Voluminous clinical studies also indicate that hypnosis can reduce the acute pain experienced by patients undergoing burn-wound debridement, children enduring bone marrow aspirations and women in labor. A meta-analysis published in a special issue of the *International Journal of Clinical and Experimental Hypnosis*, for example, found that hypnotic suggestions relieved the pain of 75 percent of 933 subjects participating in 27 different experiments. The pain-relieving effect of hypnosis is often substantial, and in a few cases the degree of relief matches or exceeds that provided by morphine.

But the Society for Clinical and Experimental Hypnosis says that hypnosis cannot, and should not, stand alone as the sole medical or psychological intervention for any disorder. The reason is that anyone who can read a script with some degree of expression can learn how to hypnotize someone. An individual with a medical or psychological problem should first consult a qualified health care pro-vider for a diagnosis. Such a practitioner is in the best position to decide with the patient whether hypnosis is indicated and, if it is, how it might be incorporated into the individual's treatment.

Hypnosis can boost the effectiveness of psychotherapy for some conditions. Another meta-analysis that examined the outcomes of people in 18 separate studies found that patients who received cognitive behavioral therapy plus hypnosis for disorders such as obesity, insomnia, anxiety and hypertension showed greater improvement than 70 percent of those who received psychotherapy alone. After publication of these findings, a task force of the American Psychological Association validated hypnosis as an adjunct procedure for the treatment of obesity. But the jury is still out on other disorders with a behavioral component. Drug addiction and alcoholism do not respond well to hypnosis, and the evidence for hypnosis as an aid in quitting smoking is equivocal.

That said, there is strong but not yet definitive evidence that hypnosis can be an effective component in the broader treatment of other conditions. Listed in rough order of tractability by hypnosis, these include a subgroup of asthmas; some dermatological disorders, including warts; irritable bowel syndrome; hemophilia; and nausea associated with chemotherapy. The mechanism by which hypnosis alleviates these disorders is unknown, and claims that hypnosis increases immune function in any clinically important way are at this time unsubstantiated.

More than 30 years ago Hilgard predicted that as knowledge about hypnosis becomes more widespread in the scientific community, a process of "domestication" will take place: researchers will use the technique more and more often as a routine tool to study other topics of interest, such as hallucination, pain and memory. He forecast that, thus grounded in science, the clinical use of hypnosis would simply become a matter of course for some patients with selected problems. Although we are not quite there today, hypnosis has nonetheless come a long way from the swinging pocket watch.

MICHAEL R. NASH is professor of psychology at the University of Tennessee at Knoxville. He researches and publishes on human memory, dissociative pathology, sex abuse, psychotherapy and hypnosis. GRANT BENHAM is assistant professor at the University of Texas-Pan American and investigates mind-body interactions, hypnosis and psychoneuroimmunology.

MORE TO EXPLORE:

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