

THE NEURAL TRANCE: *A New Look at Hypnosis*

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Abstract: Hypnosis has had a gradual conceptual emergence from an alleged mystical experience, to sleep, to a psychological shift in concentration that activates a preexisting neuro-physiological circuitry. Data are presented to support the thesis that hypnotizability exists on a spectrum that has biological as well as psychosocial components. When there is synchrony between the bio-psychosocial components of hypnotizability as measured by the Hypnotic Induction Profile (an intact flow), psychotherapy is the primary treatment strategy, with medication secondary or not at all. When measurement reveals a lack of synchrony between biological factors as measured by the Eye-Roll sign and psychosocial responsivity (a nonintact flow), medication will be primary, with different degrees of psychosocial support.

In the 1930s, I was a resident at St. Elizabeths Hospital in Washington, D.C. I was learning psychiatry and getting psychoanalyzed. During that time, I helped Prof. Gustave Aschaffenberg, a refugee from Germany, prepare for his American licensing exam in medicine. In exchange, he taught me the art of clinical hypnosis.

Little did I realize that this would be a useful talent just a few years later. World War II broke out, and I was assigned by the Army to be a battalion surgeon for 1000 men with the 1st Infantry Division. Our mission was the invasion of North Africa. In the battles that followed, there were many instances when wounded soldiers exhibited transient splits of consciousness to cope with the stress of combat. These splits showed up as spontaneous dissociative states (e.g., confusion, fugue, and derealization).

Recognizing these states as spontaneous trances, I discovered that it was possible to use persuasion and suggestion to help the men return

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to previous levels of function (Kardiner & Spiegel, 1947; H. Spiegel, 1944a, 1944b).

In less extreme cases, men were able to spontaneously block psychologically or physically unacceptable stimuli from awareness. This increased their comfort and permitted more effective performance. The process was one of fragmenting incoming stimuli and reassociating the dissociated fragments into a new pattern (H. Spiegel, 1963).

This form of coalescence enabled some soldiers to turn off fear and pain sensations to stay active in combat. The psychological rearranging of reality was observed to be a valuable coping skill that some men were able to use more easily than others (H. Spiegel, 2000).

I then joined that casualty group after a German tank broke through our lines and I was hit with a shell fragment that broke my right ankle. When I discovered that I could imagine a tingling numbness at the wound site, I refused the morphine offered to me by my aide man. I felt the numbness more than the pain.

With over a thousand men in this first clinical practice in North Africa, I developed a great respect for the practical usefulness of hypnotic concentration under stress. A point of view emerged that allowed for rapid intervention and change. It led to a more animated approach to treatment, encouraging soldiers to participate in developing and realigning their own resources to prevent psychiatric illnesses from developing (H. Spiegel, 1944a, 1944b).

Brief Definition

Now, what is hypnosis? In 1749, a French commission investigating hypnosis called it "heated imagination." In the 20th century, hypnosis has been identified as a form of "controlled imagination," i.e., attentive, receptive concentration (H. Spiegel, Greenleaf, & Spiegel, 2005). Over the years, much has been discovered about the underpinnings of this simple statement.

History

In the 1770s, Father Gassner, a Catholic priest, and Anton Mesmer were both impressed with the psychological power of hypnosis (Peter, 2005). Gassner thought it was some spiritual-mystical power that he activated. Mesmer thought the phenomenon was due to a disruption of animal magnetic forces within the subject, so for inductions he used magnets, believing he was projecting a magnetic force into the subject.

In the 1840s, James Braid used the term *hypnosis*, first attributing the patient's alteration of nervous system activity as fatigue or sleep and a paralysis of certain nerve centers. Later, he refined his theory to a form of "mono-ideism"—a mental concentration on a single dominant idea (Braid, 1843).

Braid and his followers still assumed the hypnotist projected a psychological force onto the subject. Not recognizing a spectrum of hypnotizability, the emphasis was on the hypnotist doing more to deepen the subject's state. Unfortunately, the emphasis on having the hypnotist work harder and conveying the notion that he projects something onto the person impaired the concept of self-mastery and promoted greater dependence upon the hypnotist.

Following Braid, Jean-Martin Charcot considered hypnotizability a form of mental illness or weakness (Bramwell, 1921). While many of his peers regarded hypnotic responsivity to be normal phenomena elicited from a normal mind (Bramwell), Charcot's concepts have had considerable influence over the years. To this day, many erroneously regard hypnosis as a "susceptibility" implying psychological weakness, rather than a capacity or talent.

And, to this day, there are some hypnotists who actually believe they have an inner quality that is projected onto the subject or that a prolonged induction ceremony imposes a kind of sleep onto the subject. In combat, it was clear that unless the focus was on what the soldier could do for himself, we lost manpower (H. Spiegel, 2000).

The first widely used tests to measure hypnosis in the late 1950s were the Stanford Scales (Hilgard, 1965), which unfortunately perpetuated the concept of hypnosis as susceptibility (Barabasz, 2005/2006; Hilgard, 1979; H. Spiegel, 1981). Because of my wartime experiences with hypnosis, my own thinking developed from empirical evidence derived from these various clinical settings. I observed that hypnosis was a capacity or ability that differed between people. But not until the early 1960s did a clinical case teach me about the discernable biological components of the ability to experience a hypnotic state.

A 50-year-old woman with a hysterical seizure disorder that kept her homebound was referred to me. The onus of supervising her was on her husband and children. When she came for treatment with me, she turned out to be very hypnotizable. She responded to all my signals to alter her seizure behaviors, learning to stop and to start them on her own. In just a few months, she reached her goal of preventing them from occurring. During the treatment phase, I noticed that when she went into trance she spontaneously began by looking up and nothing but the white of her eyes—her whole sclera—showed. This was unusual because I had never looked for it. Subsequent to this case, I asked each of my patients to look upward as an initial part of the induction instructions.

The following diagrams (H. Spiegel, 1972; H. Spiegel & Spiegel, 1978) show the measure of what I now refer to as the Eye-Roll (ER) sign, which is the distance between the lower eyelid and the bottom of the cornea (see Figure 1). I discovered that over a spread of hundreds

of patients the vertical movement varied from no sclera showing to showing all sclera (see Figure 2).

On analysis of 523 subjects at Columbia, we found a normal bell curve on the distribution (see Figure 3).

GRADE 3 EYE ROLL

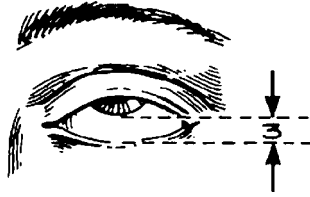


Figure 1. The Eye-Roll sign—A measure of the sclera from the lower eye-lid to the bottom of the cornea, assessing the upward mobility of the eyes (From: H. Spiegel & Spiegel, 1978).

EYE-ROLL SIGN FOR HYPNOTIZABILITY

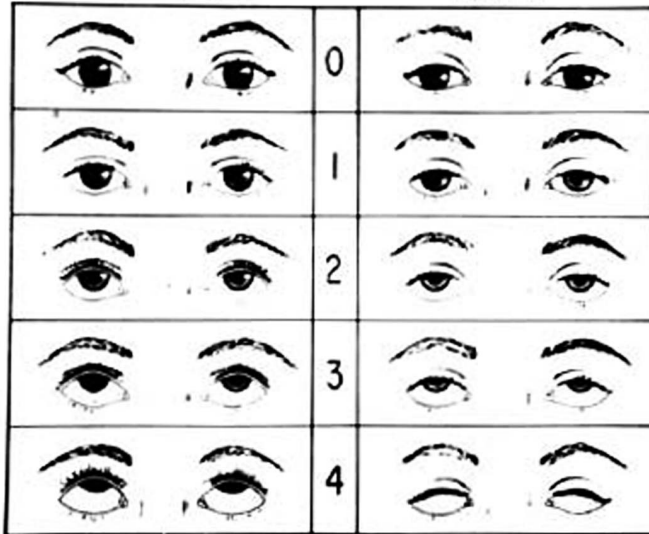


Figure 2. The upward gaze and roll for assessing the biological capacity to dissociate and scoring the potential for hypnotizability (From: H. Spiegel, 1972).

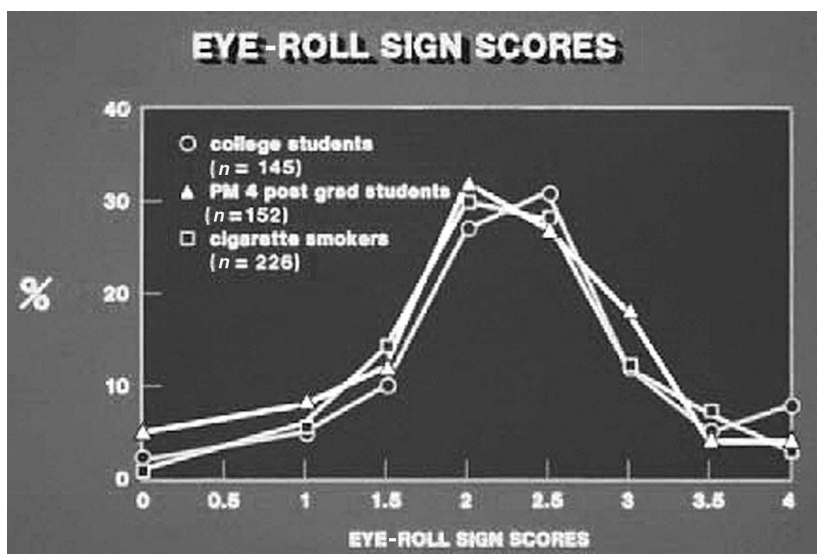


Figure 3. Normal distribution of Eye-Roll scores on 523 subjects: volunteer college students, PM 4 (postgraduate medical students) and consecutive patients for smoking cessation.

Eye-Roll Sign and the Hypnotic Induction Profile

Continued research showed if the Eye Roll (ER) is so high that practically nothing but sclera is visible, the likelihood is that the person has a high capacity for dissociation and the potential to be highly hypnotizable. If little or no sclera is seen between the lower eyelid and the lower border of the cornea, the odds are that this person's dissociative ability is on the low side and this indicates low hypnotic capacity. Further, this feature is relatively stable with no learning effect. In old age, as with many other biological systems there is some degree of attenuation (H. Spiegel, 1981; H. Spiegel & Spiegel, 1978, 2004). Even with the association between the ER and hypnotizability, more extensive assessment is needed with the Hypnotic Induction Profile (HIP) to confirm or to disconfirm responsivity. Responses on the HIP provide an assessment of mental concentration, the ability to internalize a new idea or perspective, and the degree of flow. The specific items on the HIP assess the differential ability to: experience sensory alteration; respond to suggestions; dissociate; activate parallel brain circuitry; discover some degree of involuntariness and demonstrate amnesia (H. Spiegel et al., 2005).

Put altogether, we get a simultaneous measure of biological capacity and the psychosocial ability to respond. The HIP is a 5- to 10-minute test in which the patient enters and exits from the trance experience. The patient reports subjective sensations while the examiner records

verbal responses and overt behavior (H. Spiegel, 1977; H. Spiegel et al., 2005; H. Spiegel & Spiegel, 2004).

In conducting research on hypnotizability with the HIP, a population of 5,024 consecutive patients in one sample and 769 consecutive in a second sample (a total of 5,793 consecutive patients) were assessed with the HIP by two different therapists. The analysis of data showed the same distribution within each patient population in each therapist's sample. There was confirmation and agreement between the samples that approximately 75% of the subjects were hypnotizable (20% low, 48% midrange, and 7% high) and about 25% were not (DeBetz & Stern, 1979) (see Figure 4).

When the first 2000 consecutive cases were initially analyzed (H. Spiegel, 1972), a 5-second examination of the Eye-Roll sign, graded from 0 to 4, made an accurate prediction of hypnotic trance capacity 75% of the time. In one out of four cases, the positive Eye-Roll sign was misleading (see Figure 5), but the false positives were identified with the HIP. Ninety-nine percent of the hypnotizable group scored an Eye Roll above 0; approximately one out of eight were extremely hypnotizable. A range of 20% to 30% showed evidence of cognitive impairment because of various psychiatric disorders. This was subsequently studied on a total of 4,621 cases and the same distribution was replicated (DeBetz & Stern, 1979). About 50% of the "softs" (see Figure 4) were initially unresponsive hypnotically; then, after therapy, many of these

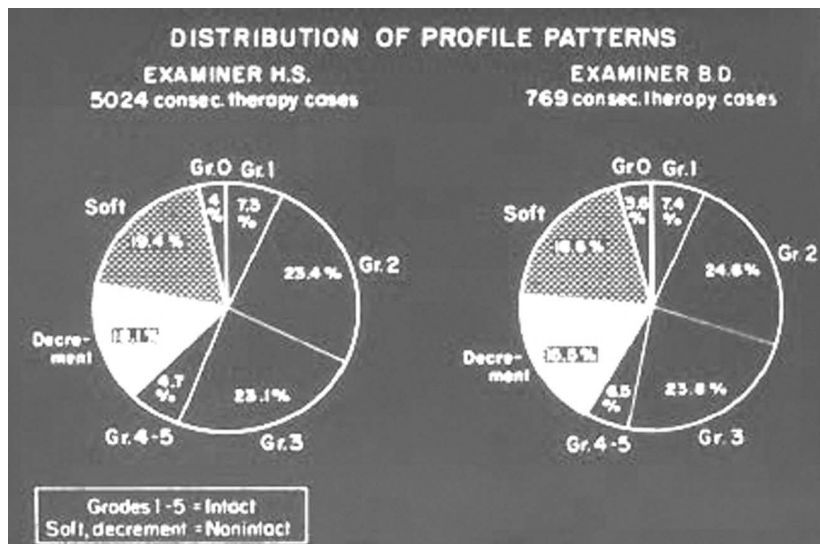


Figure 4. Replication of HIP evaluations comparing 5,024 consecutive patients of one examiner with 769 consecutive patients of a second examiner (From: DeBetz & Stern, 1979).

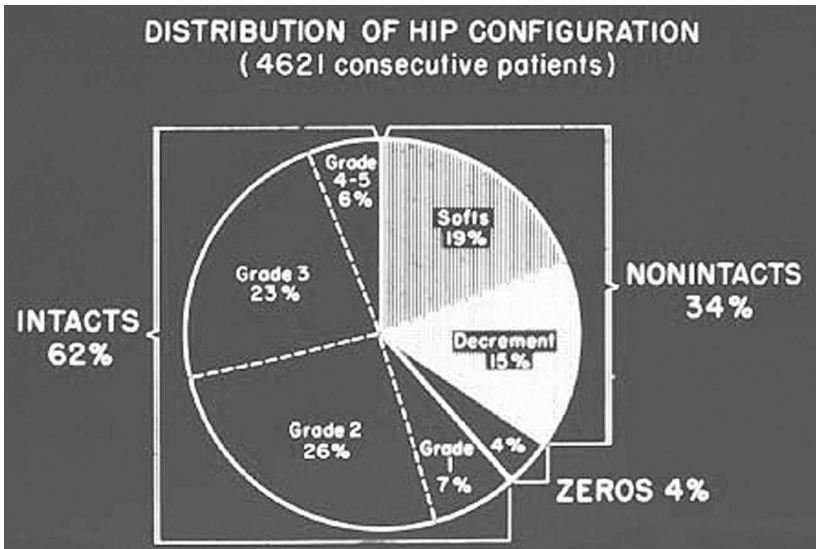


Figure 5. Scores on the HIP demonstrate a spectrum of hypnotizability associated with a distribution of mental health/mental illness as found in the Manhattan Project. In 75% of the 2000 cases, the Eye Roll accurately predicted hypnotic trance capacity (From: H. Spiegel, 1972).

became hypnotizable. “Decrements” (see Figure 4) remained nonhypnotizable even after therapy.

These findings (see Figures 4 & 5) are remarkably similar to the Manhattan Project, which found that 23.5% of the city population revealed marked to severe psychiatric problems (Srole, Langer, Opler, & Rennie, 1962; see also H. Spiegel, Fleiss, Bridger, & Aronson, 1975).

Positive responses to questions on the HIP measure a flow of concentration. This represents what Edelman refers to as functionally integrated neural processing (Edelman & Tononi, 2000, p. 124) and what I identify as an *intact profile*. Negative responses indicate a lack of this integration—a nonintact profile, soft or decrement.³ Clinically, those I

³Scores on the HIP reflect four different categories of responses. First, if the subject’s score of responsivity matches the promise of the biological measure—the Eye-Roll sign (ER)—this is an “intact” profile. Second, if the score goes beyond the promise of the ER, this is an “increment” profile, also “intact.” Third, if the score is significantly less than what the ER would indicate, this is a “soft” profile. Fourth, if the ER is above 0 and there is a total break in the flow of concentration, this is a “decrement” profile. The latter two are “nonintact.” This provides predictive data about how the subject will respond to subsequent hypnosis and to treatment in general. Different types of depression, or side effects of medication such as sedation, and more severe pathology, i.e., schizophrenia, will be reflected in a break in the subject’s flow of concentration.

identify with *nonintact profiles* have what Edelman describes as abnormalities of the dynamic core (Edelman & Tononi, p. 214). To be nonintact or, in other words, to suffer from some disruption of a dynamic core results in difficulty accepting and internalizing new information—a break in the flow.

In a sample of 1339 patients, 25% score low on the HIP (H. Spiegel, 1977; H. Spiegel, Aronson, Fleiss, & Haber, 1976; see Figure 6). We discovered, from the bimodal distribution, that differences between this curve and the normal bell curve of the ER indicated a grouping of psychologically healthy lows combined with those who scored low based on pathology. These data revealed that differences between the ER score and the HIP score help discriminate between psychological health and pathology. The healthy lows have a resonance between the ER and the HIP scores, an intact profile, and the potential for healthy behavioral change. A dissonance between the two measures is a nonintact profile, which identifies some form of biologically based pathology.

The sample of outpatients is large enough to support the hypothesis that hypnotizability, as measured by the HIP, can be assessed on a continuum and indicates a probabilistic presence or absence of psychopathology (DeBetz & Stern, 1979; H. Spiegel, 1977; H. Spiegel & Spiegel, 1978, 2004).

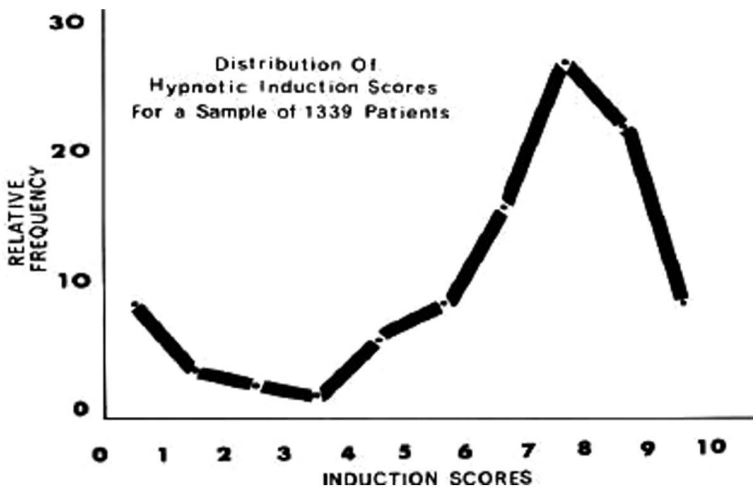


Figure 6. A bimodal distribution showing a resonance or dissonance between the Eye-Roll score and the HIP score = an intact profile (likelihood of psychological health) and nonintact profile (likelihood of biological pathology) (From: H. Spiegel, Aronson, Fleiss, & Haber, 1976).

Measurement Styles

We can now look back at some of the first attempts by the profession to measure hypnotic ability and understand some of the confusion that was generated. The subjects were usually college students; the settings were research laboratories (H. Spiegel, 1981). Subject reactions were likely to be mediated by the atmosphere of the laboratory setting. In addition, the research paradigm was based on *linear (not holistic)* logic. Psychological phenomena were divided into segments, which were then measured as individual sensory-motor responses. Volunteer subjects, presented with individual discrete test items in a laboratory setting, are most likely to respond as though confronted with an intellectual exercise or challenge. Inadvertently, the subjective processing capacity and the complexity of the whole person were overlooked.

In contrast, when a patient comes to resolve a problem of living, as part of the procedure, a therapist explores the nature of the person. Testing with the HIP permits an evaluation of the person's bio-psychosocial ability to *integrate* a new experience. Resonance or dissonance between the ER (a biological promise of hypnotizability) and the score on the HIP reveals how health, illness, motivation, and secondary gain or loss issues may influence an individual's responsivity. Immediate problems, anxiety, and transference can influence the presence or absence of the capacity to maintain a continuum of concentration (flow), which the HIP is structured to detect.

Gerald Edelman (2004), the Nobel Prize winner in physiology, reminds us that there are essentially two main modes of science—*logic* and *pattern recognition*. The logic mode is relevant for the hard sciences but when applied in areas of subjectivity, in psychological and consciousness research, it has led to what Lawrence LeShan (1990) regards as “the dilemma of psychology”—that by studying isolated segments, the whole person is consistently missed. Le Shan puts it this way—the logic mode works so well for physics for which it was designed that applying it to psychological phenomena “is like driving a superb Rolls Royce from San Francisco to New York, and saying on arrival ‘The Rolls worked so well that I shall continue my journey by driving it to London.’”

My position is that clinical pattern recognition is the mode of choice when studying trance phenomena. This is what influenced my development of the HIP. I wanted a tool that could identify patterns, a *holistic* approach, which permits us to assess both the mind-body connection and the clinical context.

Drawing from the work of Mihaly Csikszentmihalyi (1997), we've learned that when we awake from chaotic sleep, we start to respond to external stimuli and internal thoughts, using pattern recognition. A sense of integration and coordination develops. This becomes our

consciousness (Csikszentmihalyi). In mentally healthy people, this consciousness involves a continuous ribbon of concentration or *flow*. This is what we were picking up in the difference between the ER and hypnotic responsivity as measured with the HIP. In the presence of some forms of pathology, the expected flow is disrupted. These differences are, of course, reflected in differences in brain circuitry as well.

Another way to conceptualize this is Joseph LeDoux's (2002) formulation of the "synaptic self." There are more than 100 billion nerve cells and a trillion circuits in the brain. These form systems that bind together with parallel plasticity, interacting in both directions with synchrony, modulation, and convergence (LeDoux). The HIP measures individual differences in these integrated systems, which are influenced by the genetic endowment of cognition, affect, and balancing from the old brain.

With repeated reinforcement, the electrical charge at the synapses forms circuits that eventually become enduring. "What fires together, then wires together" (Edelman, 1987). Moreover, if new circuit systems develop and take over the same response area, the former systems dissolve—that is, "use it or lose it." These patterns of externally influenced neural activity can be assessed with a clinically based measure of hypnotizability. At the same time, an individual's ability to create new circuit systems is measured with a high degree of predictability.

An example of this comes from research showing that when high hypnotizable individuals are formally hypnotized and instructed to see color when looking at black-and-white patterns, there are changes in neural circuitry that cause alterations in the blood flow of the color processing areas of the brain. When these same individuals are given hypnotic instructions to see black and white while looking at color patterns, the converse is true (Kosslyn, Thompson, Costantini-Ferrando, Alpert, & Spiegel, 2000). This demonstrates that in hypnosis, external influences can initiate specific brain circuitry. Simply believing alters patterns of neural activity that is consciously experienced as seeing. In other words, believing becomes seeing.

In our clinical work, we find that various psychosocial stresses and biological problems can reverse or interrupt the integration of systems that effect consciousness and flow.

Research with open-heart surgery patients found an association between trance capacity as measured by the HIP and recovery responses (Greenleaf, Fisher, Miaskowski, & DuHamel, 1992). Postsurgery, in the intensive care unit (ICU), the blood pressure of those who were highly hypnotizable was significantly more labile than the midrange and lows. Since emotion is the dominant feature of the highs, this resonates with LeDoux's (2002) concept that "emotional arousal has powerful influences over cognitive processing" (p. 225).

The highs, who favor affect over cognition and are the most responsive to suggestive forces, experienced the external stimuli of the ICU as alarming—thus labile blood pressure. This demonstrates that the interaction between environmental stress and the brain circuitry of high hypnotizable individuals is more pronounced as compared to the midrange and the lows.

This study was replicated with burn patients and showed increased vulnerability with the high hypnotizable patients as compared to the midrange and the lows using different measures (DuHamel, Difede, Foley, & Greenleaf, 2002). This is part of an accumulating body of evidence to support the theory that the characteristic coping skills and psychopathology correspond with the ER and different degrees of hypnotizability (Frischholz, Lipman, Braun, & Sachs, 1992a; Greenleaf, 1992, 2006; Pettinati et al., 1990; D. Spiegel, Detrick, & Frischholz, 1982).

Thesis

Using the pattern-recognition mode, I propose a thesis that the vertical Eye-Roll movement is a discernable visual expression of basic functional biological circuitry. This accounts for its stability and reflects genetically endowed preconscious features like processing styles, disposition, and temperament, which are basic features that are critical aspects of personality style and the self. Antonio Damasio's work (1999) helps explain the connection between the ER sign and mind style of the individual.

He postulates that the sense of self is rooted in a genetic preconscious biologic precedent, which he labeled the *proto-self*. This old brain proto-self extends into a conscious *core-self*, which is genetic, and then into an *autobiographical-self*, which is psychosocial (Damasio, 1999).

The proto-self is a coherent collection of neural patterns which map, moment by moment, the state of the physical structure of the organism in its many dimensions. This endlessly maintained first-order collection of neural patterns occurs not in one brain place but in many, at a multiplicity of levels, from the brain stem to the cerebral cortex, in structures that are interconnected by neural pathways. We are not conscious of the proto-self. (Damasio, 1999, p. 154)

This complex circuitry involves spinal cord pathways, the trigeminal nerve—which includes the *ocular motor muscles* as reflected in the ER (H. Spiegel, 1972)—the vagus complex among many other nuclei and circuits. It is my thesis that there are important aspects of the proto-self we observe and measure with the ER and the HIP. The ER indicates the neural underpinning. This concept resonates with the new era of mind science that emphasizes biological perspectives for psychotherapy (Edelman & Tononi, 2000; Hobson, 2001; Kandel, 2006;

LeDoux, 2002). This is reaching *inward* to appreciate the wiring circuits.⁴

Definition

Now to formalize a definition of hypnosis as a *neural trance*. The neural trance is the synchronization of synaptic circuits that is activated to express each person's unique proto-self and coping style. Specific patterns emerge that reflect varying, genetically influenced abilities to control imagination and to increase focused attention. The observable and measurable components are: dissociation, absorption, and suggestibility (H. Spiegel, Greenleaf, & Spiegel, 2005; H. Spiegel & Spiegel, 1978, 2004) (see Figure 7).

1. *Dissociation* is the conscious and/or unconscious separation of memory, perception, or motor response from one's main theme of awareness. It may be a healthy adaptation to stress or pathological. For a person who is hypnotizable, the dissociated state is reversible. The capacity to dissociate is biologically determined and is reflected in the mobility of the external ocular eye muscles.
2. *Absorption* is the ability to decrease peripheral awareness to facilitate greater focal attention. The intensity and duration of absorption is influenced by bio-psychosocial factors of intelligence, interest, and motivation. Absorption is diminished by attention deficits, impaired concentration from physical disorders, psychopathology, and some medications.
3. *Suggestibility* is the proneness to accept new information with a relative suspension of customary critical judgment. Motivation, secondary gain or loss, and the mind style of a person all have an effect on suggestibility. For the high suggestible person, response to input can be almost com-

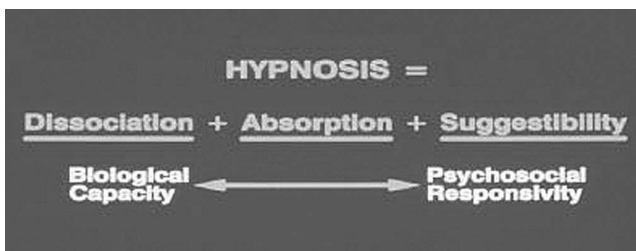


Figure 7. Components of hypnotizability on a biological–psychosocial spectrum (From: H. Spiegel, Greenleaf, & Spiegel, 2005).

⁴After this paper was presented, a new report (Lee et al., 2007) indicates that fractal analysis of EEG during trance reveals a significant relationship between the Eye-Roll sign and degree of trance capacity with measurable activity within specific cortical areas.

pulsively compliant (H. Spiegel & Greenleaf, 1992; H. Spiegel & Spiegel, 1978, 2004).

Defining and measuring these components facilitates more accurate diagnoses of normal personality styles and mental illness (Frischholz et al., 1992a; Frischholz, Lipman, Braun, & Sachs, 1992b; Frischholz, Spiegel, Trentalange, & Spiegel, 1987; H. Spiegel et al., 1975; H. Spiegel & Greenleaf, 1992) helps clinicians make more rational choices for effective treatment strategies and maximizes the potential for successful therapeutic outcome (DuHamel et al., 2002; Greenleaf, 1992, 2006; Greenleaf et al., 1992; Katz, Kao, Spiegel, & Katz, 1974; D. Spiegel, Frischholz, Fleiss, & Spiegel, 1993; D. Spiegel, Frischholz, Maruffi, & Spiegel, 1981; H. Spiegel, 2000; H. Spiegel et al., 2005; H. Spiegel & Spiegel, 1978, 2004). The data underscores the importance of pattern recognition, neurological data, and clinical observations.

MYTHS

The definition of a “neural” trance helps dispel the old myths that: hypnosis is sleep; it is projected onto someone; it is for the “weak minded”; and hypnosis occurs only when the therapist decides to use it. None of these assertions is true. We have learned that proper symptom removal with hypnosis does not lead to symptom substitution (H. Spiegel, 1967). A poorly trained or unethical therapist may be dangerous, but the trance state itself is not dangerous. Hypnosis itself is not therapy—but it is a valuable augmentation for a treatment strategy (Frischholz & Spiegel, 1983). Women are not more hypnotizable than men (Weitzenhoffer & Weitzenhoffer, 1958). To be effective, one does not have to be charismatic—trance inductions can be learned and used by any competent clinician (H. Spiegel, 1981; H. Spiegel & Spiegel, 1978, 2004).

The neuropsychological pathways and mechanisms of concentration, focal attention, motivation, and amnesia are still being explored. The data so far, however, strongly suggest that hypnotizability is essentially a neurophysiological capacity that has psychological manifestations.

INTEGRATION

In a clinical setting, once the HIP is recorded, patients can immediately be taught how to induce their own trance state and to focus on a relevant treatment strategy. The primary treatment strategy varies with the nature of the problem and the trance capacity of the person. Assessment with the HIP picks up on what I am now referring to as the neural trance. It gives us initial information in the following four different clinical domains: (a) trance capacity; (b) personality style; (c) health–illness; and, (d) therapy choice.

First, we can assess the degree of hypnotizability; low, midrange, high, or none.

Second, we can determine the individual's personality processing style. The *process* is genetically fixed, in contrast to content, which is influenced by psychosocial factors. LeDoux (2002) postulates that "The basic wiring plan of the brain is under genetic influences. . . . Genetic forces, operating on the synaptic arrangement of the brain, influence, at least to some extent, the way we act, think and feel" (p. 66).

The components of hypnotizability correlate with three types of what I now call mind styles. Since Plato, it has been postulated that mental activity has three components: cognition, affect, and motivation. Every person experiences all three, but the relative proportion of each feature varies with each individual, giving each a unique combination. This combination is like a two-horse chariot with a driver. One horse is cognition; the other is affect; the driver is motivation and serves to balance the other two. The resulting processing style is a critical feature of what is regarded as personality and self.

Because it remains relatively stable throughout life, it is likely genetically determined (Morgan, Hilgard, & Davert, 1970). Amir Raz (2005) is currently engaged in an impressive exploration of the detailed neuro-circuitry of the trance state. He reports findings that "may herald a genetic approach whereby a genotype may suggest a 'biological propensity' to complement an attentional phenotype such as hypnotizability" (p. 550).

Accordingly, biological propensities and psychosocial responsivity can be associated with three major personality clusters (see Figure 8). Over many decades, I observed clinical patterns of patients without severe psychopathology who had been assessed with the HIP. My initial observations were based on individuals with high Eye Rolls and high scores on the HIP who were capable of age regression in the present tense, posthypnotic amnesias, and persistent psychosomatic alterations (H. Spiegel, 1974; H. Spiegel & Spiegel, 1978, 2004). There seemed to be a cluster of attributes associated with high hypnotizability that led me to explore the differences with those who had less hypnotic ability.

Three different clusters of personality styles emerged as a result of the way dissociation, absorption, and suggestibility express themselves with those who scored low, midrange, and high on hypnotizability. These personality styles were indicators of predictable, characteristic behavior—the way in which an individual relates to the self and the world around the self (H. Spiegel & Greenleaf, 1992).

Those who scored high on hypnotizability tended to be extremely trusting, with a high degree of surface malleability and an extreme propensity to dissociate, a marked ability for total absorption, with an almost complete abandonment of peripheral awareness and a readiness

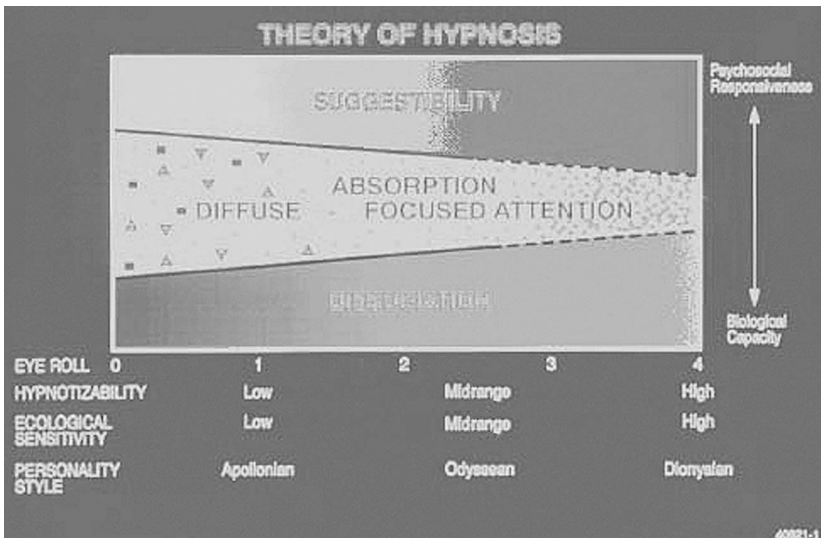


Figure 8. Associations between the Eye Roll and hypnotizability, ecological sensitivity and three major clusters of personality styles are measurable on a cognitive-affective spectrum (From: H. Spiegel & Greenleaf, 1992).

to respond uncritically to new signals. I labeled this cluster *Dionysian*, after the Greek god Dionysus, who was known for spontaneous behavior with an absence of critical judgment. The Dionysians have a clear preference to be dominated by the “heart” mind rather than the “brain” mind, favoring emotions over logic and rationality. They are ever ready to suspend critical judgment, to comply with impositions from the outside making them the most ecologically sensitive and the most vulnerable to persuasion.

At the opposite end of the spectrum were those who scored low on hypnotizability and tended to be logical, to prefer reason over passion. I labeled this cluster *Apollonian*, after the Greek god Apollo who represented logic and order. Those at the low end of hypnotizability are likely to favor their “brain” mind over their “heart” mind, placing the highest priority on logic, order, analysis, and critical judgment. Apollonians have a limited experience of dissociation; sharply focalized attention with concomitant and constant peripheral awareness; and slight suggestibility. They are biased toward cognitive dynamisms and relatively remote from or somewhat independent of ecological influence.

Those who score in the midrange of hypnotizability reflect varying combinations of the above polarities. They exhibit trends toward oscillating between periods of relative action and inaction. I labeled this cluster of characteristics *Odyssean*, after Homer’s mythical man, Odysseus,

who wandered between his head and his heart to find his way home. The Odysseans tend to fluctuate between feeling and thinking; self-absorption and involvement in life; and action and despair. They have a moderate ability to experience dissociation with less vigilant peripheral awareness than the Apollonian. The Odysseans, in their quest for balance—finding the middle way—may veer toward the Dionysian or Apollonian personality style. In studies of 91 extremely creative persons, this dialectical interaction is pronounced (Csikszentmihalyi, 1999).

Overall, on a continuum of personality fixity on one end and flexibility on the other end, the Apollonian tends to be more fixed with a propensity to control, the Odyssean is less fixed with a tendency to oscillate, and the Dionysian tends to be quite flexible and malleable.

From a bio-psychosocial perspective, this enables us to be more sensitive to the interaction of biological features (dissociation and relative fixity as indicated by the Eye-Roll sign) with the psychological and social context. From examining personality styles, one can begin to identify the interaction of fixed biological determinants with the panoply of psychosocial factors.⁵

To summarize, the ER reflects the *processing style* of that person and is a stable critical feature of what is regarded as personality and self. In addition to assessing hypnotizability and personality style, the score on the HIP indicates the presence or absence of flow between the biological features and psychosocial variables.

When a patient presents with a psychiatric problem, the provocation may be related to internal factors (e.g., genetics, drugs, biological deficits) and/or external factors (e.g., stress, deprivation, or trauma), which result in an impairment of psychological function. These factors interact in identifiable patterns consistent with the clusters of personality style (H. Spiegel & Greenleaf, 1992, 2006; H. Spiegel & Spiegel, 1978, 2004). In the presence of a psychiatric disorder, the interaction of the provocative factors with the bio-psychosocial features of the individual manifest as predictable clinical syndromes (Axis I) or personality disorders (Axis II) (see Figures 9 & 10).

For example, pathology in the cognitive Apollonian type, low on the scale of hypnotizability, is usually manifested as cognitive impairments such as avoidant interpersonal styles and a proneness to despair; e.g., obsessive compulsive disorder, anorexia, generalized anxiety, and schizophrenia (Axis I) and schizoid, paranoid, and avoidant personality disorders (Axis II).

⁵For a more thorough discussion, please see: Spiegel, H. (1977). The Hypnotic Induction Profile (HIP): A review of its development. *Annals of the New York Academy of Science*, 296, 129–142; Spiegel, H., & Spiegel, D. (1978; 2004). *Trance & Treatment: Clinical Uses of Hypnosis*, Washington, DC: American Psychiatric Publishing Co.; Greenleaf, M. (2006). Mind styles and the hypnotic induction profile: Measure and match to enhance medical treatment. *American Journal of Clinical Hypnosis*, 49:1, 2006.

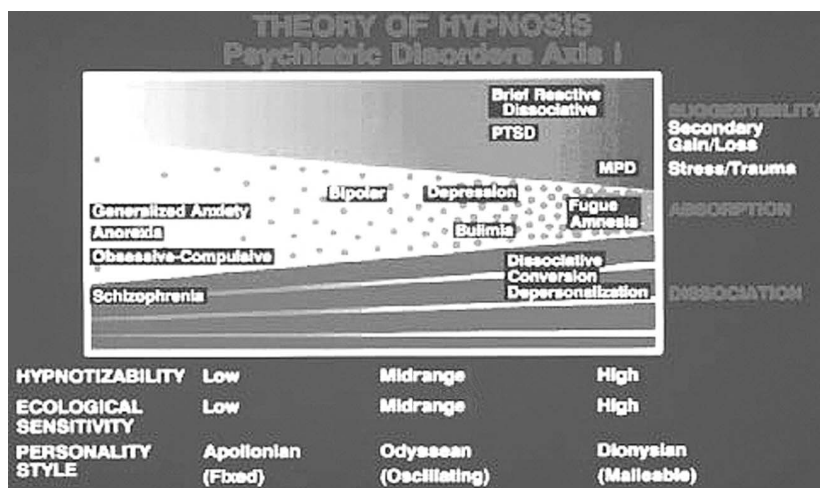


Figure 9. Associations between AXIS I diagnoses and hypnotizability, ecological sensitivity, and personality style (From: H. Spiegel, Greenleaf, & Spiegel, 2005).

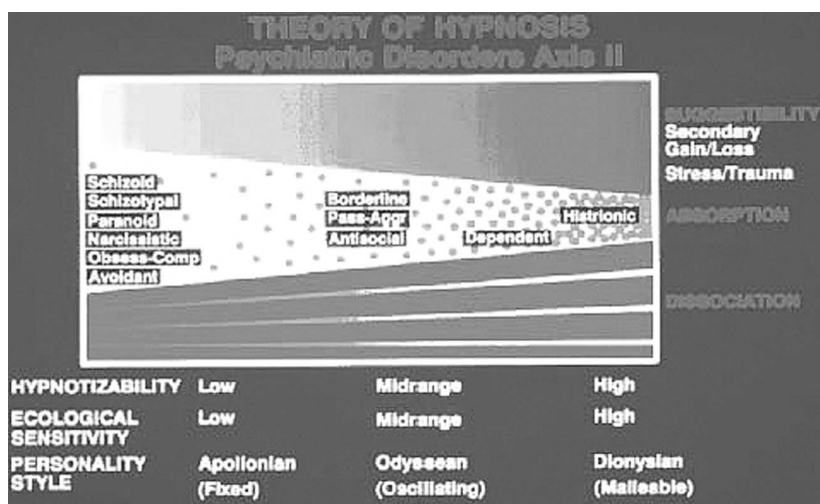


Figure 10. Associations between AXIS II Diagnoses and hypnotizability, ecological sensitivity, and personality style (From H. Spiegel, Greenleaf, & Spiegel, 2005).

Pathology with the willful Odyssean type, midrange on the scale of hypnotizability, usually reveals problems of intimacy, fluctuating assumptions, and beliefs with resultant confusion and is subject to

mood swings, e.g., bipolar disorder, reactive depression, bulimia (Axis I), and borderline, passive-aggressive and antisocial personality disorders (Axis II).

Pathology in the affective Dionysian, high on the scale of hypnotizability, is likely to be expressed as disruptions of self-integration, dependency to the point of helplessness, and is vulnerable toward major depression, dissociative identity disorder, fugue, amnesia, somatization, conversion, depersonalization, posttraumatic stress disorder (Axis I), and histrionic personality, dependent personality disorders (Axis II) (H. Spiegel et al., 2005).

In the third domain, on a psychiatric health–illness continuum, where does a person fit? An intact response on the HIP implies the probability of good mental health, i.e., it is consistent with an intact flow of concentration. When there is a break between the biological promise of the ER and the resulting degree of hypnotic concentration, this signals the probability of impairment due to psychopathology, neurological deficit, or chemical toxicity.

LeDoux's research (2002) on interruptions of synaptic connections helps explain the break between the promise of the ERs and hypnotic concentration. In a disciplined way, we can use the HIP to clarify ineffective or dysfunctional behaviors, as distinct from mental disease or neurological impairment.

In the fourth domain, the patterns that we find on the spectrum of hypnotizability provide a model to understand where an individual fits on a cognitive-affective continuum. For those who are psychologically healthy, low-, midrange-, and high-trance capacity corresponds to a range from cognitive to affective mind styles.

The traits and processing modes related to the ER and the ability to experience trance manifest with or *without* a formal induction of trance. Those with a low ER, the Apollonians, value reason and logic above all. The “why” therapies meet their cognitive needs by emphasizing analytical exploration for insight and rational explanations. Those with a high ER, the Dionysians, can become so influenced by feelings that, to some extent, they often lose direction, context, and organization. The “what” therapies help them manage affective distress by emphasizing guidance, direction, and supportive persuasion to focus their resources more clearly. This gives us a template from which to choose relevant treatment strategies—from cognitive “why” therapies for those with a low ER and “what” therapies for those with a high ER (see Figure 11).

Those with intact profiles benefit the most from psychotherapy, with medication either secondary or unnecessary. They have more resilience and demonstrate an ability to consider new perspectives. In addition to appropriate psychotherapy, an assessment can be made as

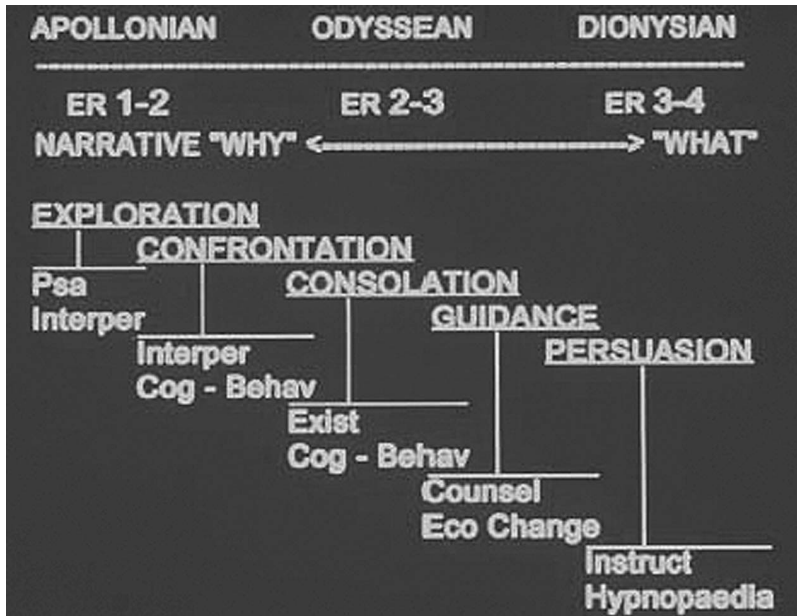


Figure 11. Therapies for intact profiles (those with no biological pathology) to maximize a match with personality styles on a cognitive-affective spectrum.

to whether or not external circumstances are sufficient to warrant medication over a specified period of time.

Those who cannot maintain a flow of concentration and test with nonintact profiles are the most likely to need medication as the primary treatment mode, with psychotherapy playing a secondary role, or none at all. These patients have difficulty accepting new perspectives or premises. Whether such a break in the ribbon of concentration is transient or permanent, medication will be crucial. It will up to the therapist to assess the type and degree of ongoing psychosocial support that will prove useful.

To put the importance of treatment choice another way, centuries ago, Democritus said, "Water can be good and bad, useful and dangerous. To the danger, however, a remedy has been found: learning to swim" (De Santillana, 1961). Albert Einstein maintained that "imagination is more useful than knowledge." One way to facilitate the art of swimming is with the controlled imagination of the trance experience.

For those who can swim, we can identify an intact flow of concentration with disruptive behavior problems, then introduce appropriate

corrective strategies *without* medication, and provide new perspectives for more effective behavior with self-mastering techniques. For those who swim with difficulty, or not at all, we can help *with* medication as the primary therapy and/or supportive psychotherapy. The HIP then, becomes a tool—a brief practical procedure to identify neural processing features. We can then make distinctions between prime candidates for psychotherapy, as the primary therapeutic intervention, from those who require medication, with or without supportive psychotherapy.

SUMMARY

With recent advances in neuro-psychological research, our knowledge of hypnosis during the last three centuries has shifted from being regarded as: a spiritual or magnetic projection, to some kind of sleep, then a somewhat awake state, and a susceptibility, inferring mental weakness with misleading reductionistic measurement. The trance state is now acknowledged as a form of *controlled imagination* or focused concentration; a reflection of *biological circuitry*; an expression of an innate capacity or talent; and measurable as a ribbon of concentration or *flow*.

These elements reflect a preconscious proto-self—an indicator of the basic mind style of the person. The ER—the *visible monitor* of the proto-self—displays a place on a spectrum of brain-body interaction that can be assessed with the HIP.

CONCLUSION

This is my central theme. Why *neural trance*? We currently have a growing knowledge of the underlying neural circuitry that is activated with hypnotic induction. What started as simply a brief (5 to 10 minute) clinical test for trance capacity has developed into a short, disciplined clinical evaluation of personality *processing* style. This can be a useful practical guide to sharpen diagnosis and treatment choice. By regarding the ER as a surface indicator of underlying synaptic circuitry, and using the pattern recognition mode, we can identify how synaptic circuits synchronize, expressing each person's unique *fixed proto-self* and *coping style*. The HIP confirms the quality of the flow, or its deficiency, in the brain circuitry.

In this way, the eyes are a window into the brain and help us identify the unique processing style of each individual. With this new understanding of neural circuitry, we are able to combine the art of clinical intuition with the science of measurement.

REFERENCES

- Barabasz, A. (2005/2006). Whither spontaneous hypnosis: Critical issue for practitioners and researchers. *American Journal of Clinical Hypnosis*, 48, 91–97.
- Braid, J. (1843). *Neurypnology: Or the rationale of nervous sleep considered in relationship to animal magnetism*. London: Churchill.
- Bramwell, J. M. (1921). *Hypnotism: Its history, practice and theory*. London: William, Rider & Son, Ltd.
- Csikszentmihalyi, M. (1997). *Finding flow*. New York: Basic Books.
- Csikszentmihalyi, M. (1999). *Creativity: Flow and the psychology of discovery and invention*. New York: Harper Collins.
- Damasio, A. (1999). *The feeling of what happens: Body and emotion in the making of consciousness*. New York: Harcourt, Brace.
- DeBetz, B., & Stern, D. B. (1979). Factor analysis and score distributions of the HIP – replications by a second examiner. *American Journal of Clinical Hypnosis*, 22, 95–102.
- De Santillana, E. (1961). *The origins of scientific thought*. Chicago: University of Chicago Press.
- DuHamel, K. N., Difede, J., Foley, F., & Greenleaf, M. (2002). Hypnotizability and trauma symptoms after burn surgery. *International Journal of Clinical and Experimental Hypnosis*, 50, 33–50.
- Edelman, G. (1987). *Neural Darwinism: The theory of neuronal group selection*. New York: Basic Books.
- Edelman, G. (2004). *Wider than the sky: The phenomenal gift of consciousness*. New Haven: Yale University Press.
- Edelman, G., & Tononi, G. (2000). *A universe of consciousness: How matter becomes imagination*. New York: Basic Books.
- Frischholz, E. J., Lipman, L. S., Braun, B. G., & Sachs, R. G. (1992a). Psychopathology, hypnotizability and dissociation. *American Journal of Psychiatry*, 149, 1521–1525.
- Frischholz, E. J., Lipman, L. S., Braun, B. G., & Sachs, R. G. (1992b). Suggested post-hypnotic amnesia in psychiatric patients and normals. *American Journal of Clinical Hypnosis*, 35, 29–39.
- Frischholz, E. J., & Spiegel, D. (1983). Hypnosis is not therapy. *Bulletin of the British Society of Clinical and Experimental Hypnosis*, 6, 3–8.
- Frischholz, E. J., Spiegel, D., Trentalange, M. J., & Spiegel, H. (1987). The Hypnotic Induction Profile and absorption. *American Journal of Clinical Hypnosis*, 30, 87–93.
- Greenleaf, M. (1992). Clinical implications of hypnotizability: Enhancing the care of medical and surgical patients. *Psychiatric Medicine*, 10, 77–86.
- Greenleaf, M. (2006). Mind styles and the hypnotic induction profile: Measure and match to enhance medical treatment. *American Journal of Clinical Hypnosis*, 49, 41–58.
- Greenleaf, M., Fisher, S., Miaskowski, C., & DuHamel, K. (1992). Hypnotizability and recovery from cardiac surgery. *American Journal of Clinical Hypnosis*, 35, 19–128.
- Hilgard, E. R. (1965). *Hypnotic susceptibility*. New York: Harcourt, Brace & World.
- Hilgard, E. R. (1979). *A saga of hypnosis: Two decades of Stanford University hypnotic laboratory research*. Palo Alto, CA: Stanford University.
- Hobson, A. (2001). *Out of its mind: Psychiatry in crisis*. Cambridge, MA: Perseus.
- Kandel, E. (2006). *In search of memory: The emergence of a new science of mind*. New York: W. W. Norton & Company.
- Kardiner, A., & Spiegel, H. (1947). *War stress and neurotic illness*. New York: Paul Hoeber & Co.
- Katz, R. L., Kao, C. Y., Spiegel, H., & Katz, G. J. (1974). Acupuncture and hypnosis. *Advances in Neurology*, 4, 819–825.
- Kosslyn, S. M., Thompson, W. L., Costantini-Ferrando, M. F., Alpert, N. M., & Spiegel, D. (2000). Hypnotic visual illusion alters color processing in the brain. *American Journal of Psychiatry*, 157, 1279–1284.

- LeDoux, J. (2002). *The synaptic self*. New York: Viking Penguin.
- Lee, J-S., Spiegel, D., Kim, S-B., Lee, J-H., Kim, S-I., Yang, B-H., et al. (2007). Fractal analysis of EEG in hypnosis and its relationship with hypnotizability. *International Journal of Clinical and Experimental Hypnosis*, 55, 14–31.
- LeShan, L. (1990). *The dilemma of psychology*. New York: Dutton.
- Morgan, A., Hilgard, E. R., & Davert, E. C. (1970). The heritability of hypnotic susceptibility in twins. *Behavior Genetics*, 1, 213–224.
- Peter, B. (2005). Gassner's exorcism—not Mesmer's magnetism—is the real predecessor of modern hypnosis. *International Journal of Clinical and Experimental Hypnosis*, 53, 1–14.
- Pettinati, H. M., Kogan, L. G., Evans, F., Wade, J. H., Horne, R. L., & Staats, J. M. (1990). Hypnotizability of psychiatric inpatients according to two different scales. *American Journal of Psychiatry*, 147, 69–75.
- Raz, A. (2005). Attention and hypnosis: Neural substrates and genetic associations of two converging processes. *International Journal of Clinical and Experimental Hypnosis*, 53, 237–258.
- Spiegel, D., Detrick, E., & Frischholz, E. J. (1982). Hypnotizability and psychopathology. *American Journal of Psychiatry*, 139, 431–439.
- Spiegel, D., Frischholz, E. J., Fleiss, J. L., & Spiegel, H. (1993). Predictors of smoking abstinence following a single session restructuring intervention with self-hypnosis. *American Journal of Psychiatry*, 150, 1090–1097.
- Spiegel, D., Frischholz, E. J., Maruffi, B. L., & Spiegel, H. (1981). Hypnotic responsiveness and the treatment of flying phobia. *American Journal of Clinical Hypnosis*, 23, 239–247.
- Spiegel, H. (1944a). Psychiatric observations in the Tunisian Campaign. *American Journal of Orthopsychiatry*, 14, 381–385.
- Spiegel, H. (1944b). Preventive psychiatry with combat troops. *American Journal of Psychiatry*, 101, 310–315.
- Spiegel, H. (1963). The dissociation-association continuum. *Journal of Nervous and Mental Disorders*, 136, 374–378.
- Spiegel, H. (1967). Is symptom removal dangerous? *American Journal of Psychiatry*, 123, 1279–1283.
- Spiegel, H. (1972). An eye-roll test for hypnotizability. *American Journal of Clinical Hypnosis*, 15, 25–28.
- Spiegel, H. (1974). The grade 5 syndrome: The highly hypnotizable person. *International Journal of Clinical and Experimental Hypnosis*, 22, 303–319.
- Spiegel, H. (1977). The Hypnotic Induction Profile (HIP): A review of its development. *Annals of the New York Academy of Science*, 296, 129–142.
- Spiegel, H. (1981). Hypnosis: Myth and reality. *Psychiatric Annals*, 11, 336–342.
- Spiegel, H. (2000). Silver linings in the clouds of war: A five-decade retrospective. In R. Menninger & J. Nemiah (Eds.), *Post WW II History of American Psychiatry* (pp. 52–71). Washington, DC: American Psychiatric Press.
- Spiegel, H., Aronson, M., Fleiss, J. L., & Haber, J. (1976). Psychometric analysis of the Hypnotic Induction Profile. *International Journal of Clinical and Experimental Hypnosis*, 24, 300–315.
- Spiegel, H., Fleiss, J. L., Bridger, A. A., & Aronson, M. (1975). Hypnotizability and mental health. In Arieti, S. (Ed.), *New dimensions in psychiatry: A world view* (pp. 314–365). New York: John Wiley & Sons.
- Spiegel, H., & Greenleaf, M. (1992). Personality style and hypnotizability: The fix-flex continuum. *Psychiatric Medicine*, 10, 13–24.
- Spiegel, H., & Greenleaf, M. (2006). Commentary: Defining hypnosis. *American Journal of Clinical Hypnosis*, 48(2–3), 111–116.
- Spiegel, H., Greenleaf, M., & Spiegel, D. (2005). Hypnosis: An adjunct for psychotherapy. In B. J. Kaplan & V. A. Sadock (Eds.), *Kaplan & Sadock's comprehensive textbook of psychiatry* (8th ed., pp. 2548–2568). Virginia: Lippincott, Williams & Wilkins.
- Spiegel, H., & Spiegel, D. (1978). *Trance & treatment: Clinical uses of hypnosis*. New York: Basic Books.

- Spiegel, H., & Spiegel, D. (2004). *Trance & treatment: Clinical uses of hypnosis* (2nd ed.). Washington, DC: American Psychiatric Press.
- Srole, L., Langer, T. S., Opler, M. L., & Rennie, T. A. C. (1962). *Mental health in the metropolis*. New York: McGraw-Hill.
- Weitzenhoffer, A. M., & Weitzenhoffer, G. B. (1958). Sex, transference, and susceptibility to hypnosis. *American Journal of Clinical Hypnosis*, 1, 15–24.

Die neuronale Trance: Ein neuer Blick auf Hypnose

Herbert Spiegel

Zusammenfassung: Hypnose durchlief einen graduellen Wandel von einer scheinbar mystischen Erfahrung hin zu einem schlafähnlichen Zustand, dann hin zu einer psychologischen Verlagerung der Aufmerksamkeit, welche zugrunde liegende neurophysiologische Schaltkreise aktiviert. Es werden Daten vorgestellt, welche die These stützen, dass Hypnotisierbarkeit sich entlang eines Spektrums aus biologischen und psychosozialen Bestandteilen verstehen lässt. Wenn die bio-psycho-sozialen Bestandteile der Hypnotisierbarkeit, wie sie etwa im Hypnotic Induction Profile (HIP) gemessen werden, sich in Synchronie befinden, ist Psychotherapie die primäre Behandlungsstrategie und Medikation folgt, wenn überhaupt, nur an zweiter Stelle. Wenn die Messung allerdings ein Fehlen von Synchronie zwischen biologischen Faktoren (gemessen mit dem Augen-Roll-Zeichen) und psychosozialer Ansprechbarkeit anzeigt, sollte primär die Medikationsstrategie gewählt werden, ergänzt durch psycho-soziale Unterstützung.

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La transe neurale: Une nouvelle façon de percevoir l'hypnose

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Résumé: La perception de l'hypnose a évolué graduellement. D'abord perçue comme une expérience mystique présumée, l'hypnose a ensuite été associée au sommeil, puis à un changement psychologique dans la concentration activant une circuiterie neurophysiologique préexistante. Des données sont présentées de façon à appuyer la thèse selon laquelle il existe un vaste éventail de types d'hypnotisabilité comprenant des éléments tant biologiques que psychosociaux. Lorsqu'une synchronisation existe entre les composantes biopsychosociales de l'hypnotisabilité mesurée selon le Profil d'induction hypnotique (HIP) (résultat cohérent), la psychothérapie constitue la première stratégie de traitement, suivie, au besoin, d'une médication. Lorsque le HIP révèle un manque de synchronisation entre les facteurs biologiques mesurés par le roulement des yeux et la responsivité psychosociale (résultat non cohérent), la médication constitue la première stratégie, laquelle on accompagnera de différents degrés de soutien psychosocial.

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El trance neuronal: Una nueva perspectiva de la hipnosis

Herbert Spiegel

Resumen: La hipnosis ha tenido una emergencia conceptual gradual desde una presunta experiencia mística, pasando por el sueño, hasta un cambio psicológico en la concentración que activa un sistema de circuitos neurofisiológicos pre-existente. Presento datos que apoyan la tesis de que la hipnotizabilidad existe en un espectro con componentes biológicos y psicosociales. Cuando hay sincronía entre los componentes bio-psicosociales de la hipnotizabilidad según el Perfil de Inducción Hipnótica o Hypnotic Induction Profile (un flujo intacto), la psicoterapia es la estrategia primaria de tratamiento, con la medicación como una estrategia secundaria o no utilizable. Cuando la evaluación da a conocer una carencia de sincronía entre factores biológicos medidos por la señal levantar los ojos y la responsividad psicosocial (un flujo no intacto), la medicación será primaria, con grados diferentes de apoyo psicosocial.

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