

The Neural Trance: A New Look at Hypnosis

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Objective: To review a shift in perspective of hypnosis from being mystical, then magnetic, to role-playing, then most recently susceptibility, to some kind of transference projection from the hypnotist and a transient psychological dissociation to a combination of a state-trait experience with identifiable biological underpinnings.

Method: Data will be presented to: 1) support the Eye Roll (ER), the vertical upgaze of the eyes, as a biological feature associated with the capacity to dissociate; and, 2) to demonstrate the hypnotic state, as measured by the Hypnotic Induction Profile (HIP) as an identifier of an individual's ability to maintain an integrated flow of concentration. Summary data will include the association of measured hypnotizability, using the ER and the HIP, with psychological health and psychopathology.

Results: Old myths are dispelled. On examining over 5,000 patients, measurements indicate that about 75% of the population has a varying capacity for hypnosis on a spectrum of 0-4. About 5% have no inherent ability. About 20% have impaired capacity due to some form of psychopathology which is revealed by an interruption of the flow of concentration. Three overlapping levels of trance capacity correlates with three major mind styles, Apollonian (cognitive), Odyssean (willful), Dionysian (affective). In the presence of pathology, these mind styles correlate with specific of AXIS I and AXI II pathology.

Conclusion: Clinically, the ER sign is a surface indicator of underlying neural circuitry. The HIP makes the distinction between health and pathology and helps predict appropriate treatment strategies as well as assessing hypnotizability.

INTRODUCTION

In the 1930's, I was a resident at St. Elizabeths Hospital in Washington, DC. I was learning psychiatry and getting psychoanalyzed. During that time, I helped Prof. Gustave Aschaffenburg, 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. WWII broke out and I was assigned by the Army to be a battalion surgeon for a 1000 men with the 1st Infantry Division. Our mission was the invasion of North Africa. In the battles which 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 de-realization) (1,2,3).

Recognizing these states as spontaneous trances, I discovered that it was possible to use persuasion and suggestion to help the men return to previous levels of function (2,3) .

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 re-associating the dissociated fragments into a new pattern (4). 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 (4, 5). 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 which 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 (2, 3).

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 (6). Over the years, much has been discovered about the underpinnings of this simple statement.

HISTORY

In the 1770’s, Father Gassner, a Catholic priest, and, Anton Mesmer were both impressed with the psychological power of hypnosis (7). 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 1840’s, 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 (8, 9).

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.

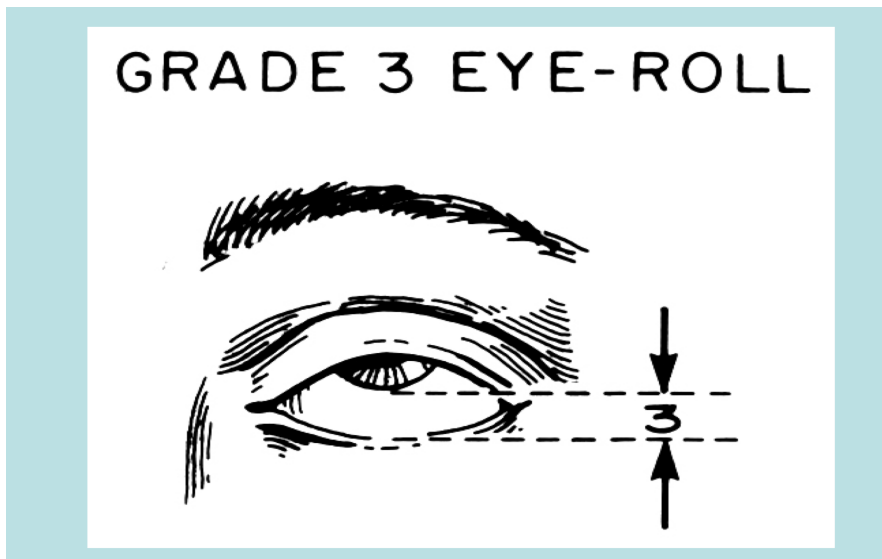
Following Braid, Jean-Martin Charcot considered hypnotizability a form of mental illness or weakness (9). While many of his peers regarded hypnotic responsivity to be normal phenomena elicited from a normal mind (9), Charcot's concepts have had considerable influence over the years. To this day, many 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 into the subject. In combat, it was clear that unless the focus was on what the soldier could do for himself, we lost manpower (2, 3, 5).

The first widely used tests to measure hypnosis in the late 1950's were the Stanford Scales (10), which unfortunately perpetuated the concept of hypnosis as susceptibility (11, 12). Because of my war time 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 1960's did a clinical case teach me about the discernable biological components of the ability to go into a hypnotic state.

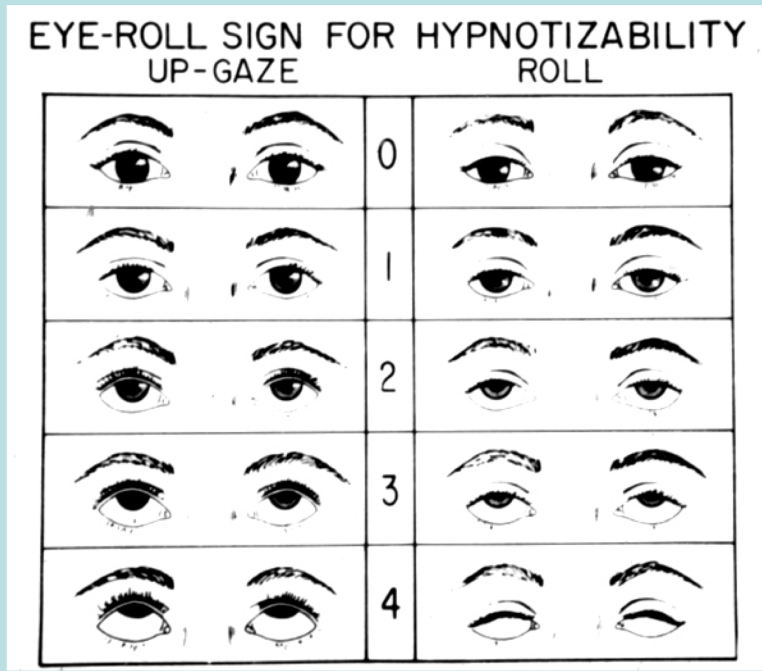
A 50 year old woman was referred to me with a hysterical seizure disorder which kept her homebound. The onus of supervising her was on her husband and children. When she came for treatment with me, she turned out to be very hypnotizable. She responded to all my signals to alter her seizure behaviors, learning to stop and 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 (13) show the measure of what I now refer to as the Eye Roll (ER) sign, which is the distance between the lower eye-lid and the bottom of the cornea.

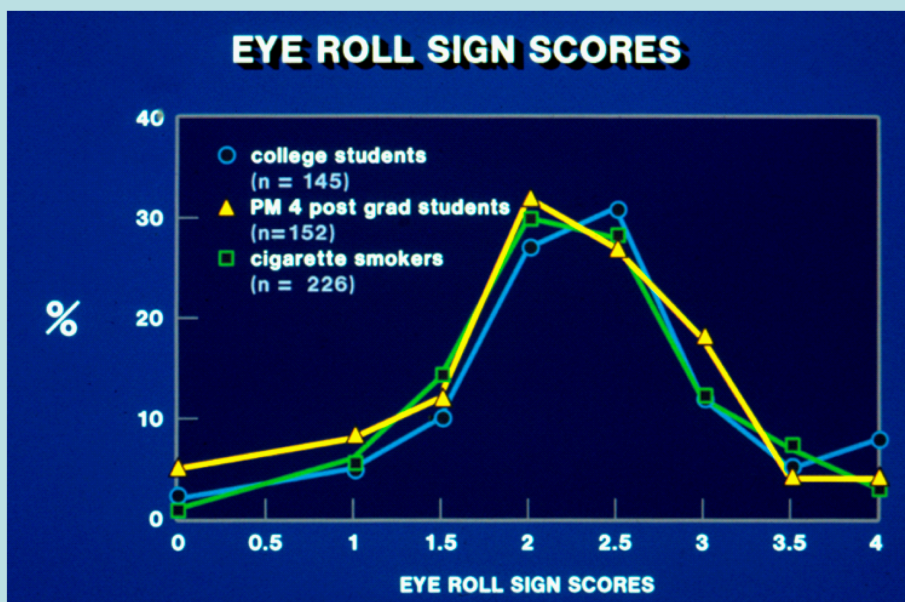


I discovered that over a spread of hundreds of patients the vertical movement varied from no sclera to showing all sclera.

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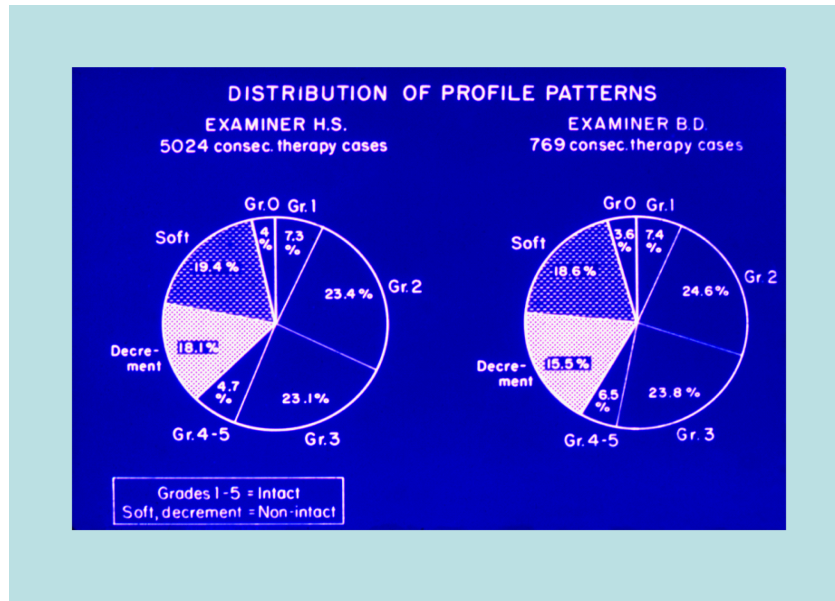
On analysis of 523 subjects at Columbia , we found a normal bell curve on the distribution.



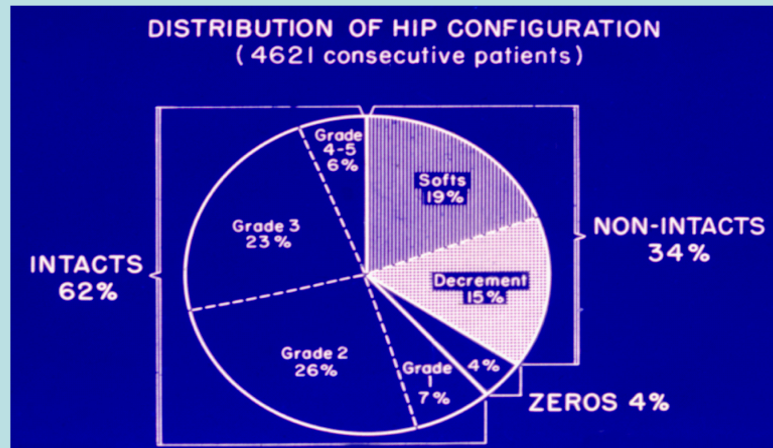
EYE ROLL SIGN AND THE HYPNOTIC INDUCTION PROFILE

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 dissociative ability is on the low side and this indicates low hypnotizability. 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 (11, 14,15). Even with the association between the ER and hypnotizability, more extensive assessment is needed with the Hypnotic Induction Profile (HIP) to confirm or 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 (6, 14,15, 16). Put altogether, we get a simultaneous measure of biological capacity and the psycho-social 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 (6, 15, 16). 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 about 75% of the subjects were hypnotizable (20% low, 48% mid-range and 7% high) and about 25% were not (17).

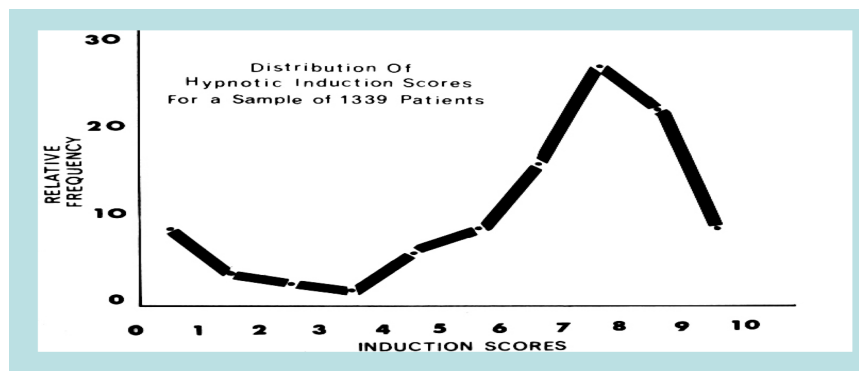


When the first 2000 consecutive cases were initially analyzed (13) about 20-30% in this group showed evidence of cognitive impairment because of various psychiatric disorders. This was subsequently studied on a total of 4,621 cases and the same distribution was replicated (17). About 50% of the “softs” (see diagram) were initially ve hypnotically, then after therapy, many of these became hypnotizable. “Decrements” (see diagram) remained non-hypnotizable even after therapy. ²



These findings (see diagram) are remarkably similar to the Manhattan Project which found that 23.5% of the city population revealed marked to severe psychiatric problems (18, 19).

Positive responses to questions on the HIP measure a flow of concentration. This represents what Edelman refers to as functionally integrated neural processing (20) - an intact profile. Negative responses indicate a lack of this integration- a non-intact profile, soft or decrement (see footnote 2). Clinically, those with a non-intact profile have “abnormalities of the dynamic core “ (20) which results in an inability to accept new information and internalize it – an absence of flow.



(21)

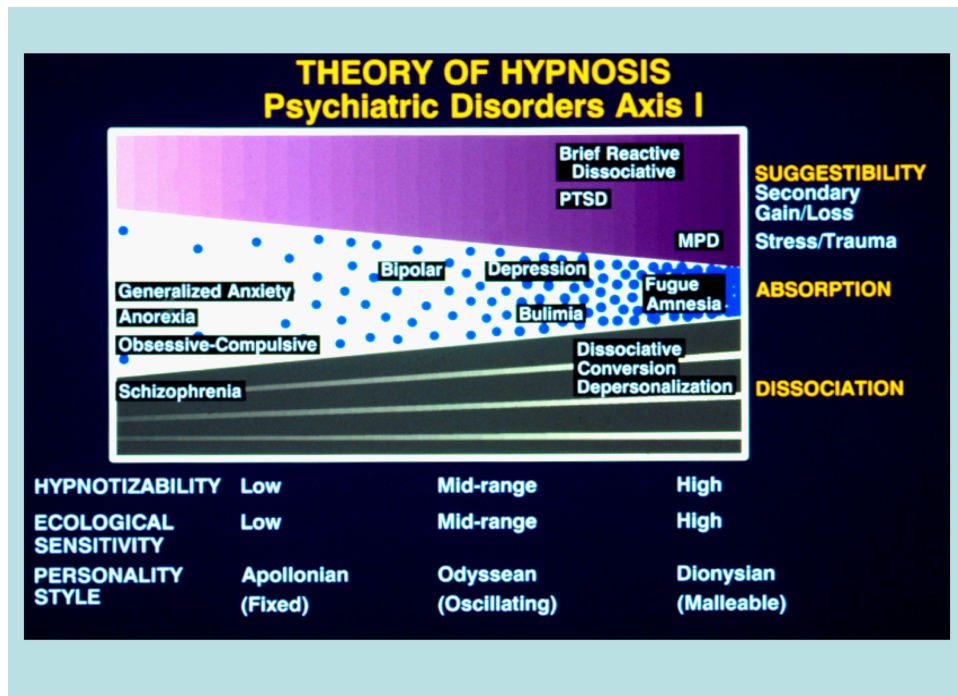
About 25% of this sample population of 1000 score low on the HIP. We discovered, from the bimodal distribution, that differences between this curve and the normal bell curve of the ER indicated we had a grouping of psychologically healthy lows combined with those who scored low based on pathology. This 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, with the potential for healthy behavioral change. A dissonance between the two measures is a non-intact profile, which identifies some form of biologically based pathology.

The sample of out-patients used to study the HIP is large enough to support the hypothesis that hypnotizability can be measured on a continuum and indicates a probabilistic presence or absence of psychopathology (14, 16, 17, 21). 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 personality style (12, 14, 15, 21). The interaction of the provocative factors with the bio-psycho-social features of the individual manifest as predictable Clinical Syndromes (Axis I) or Personality Disorders (Axis II).

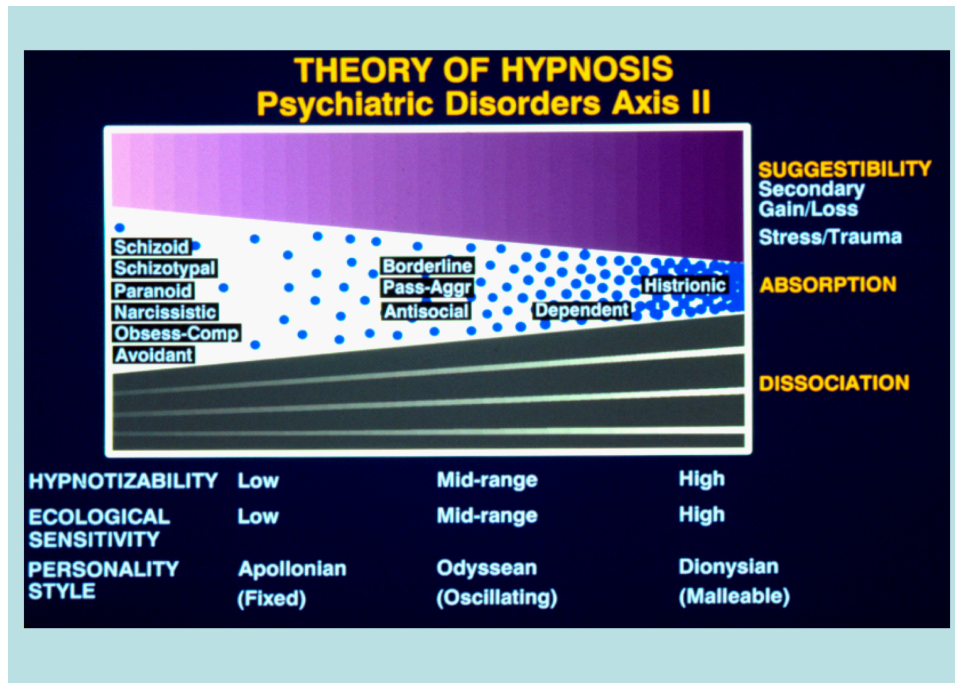
For example, pathology in the cognitive “Apollonian” type, low on the scale of hypnotizability, is usually manifested as cognitive impairments such as avoidant interpersonal styles and a proneness to despair; e.g. Obsessive Compulsive Disorder, Anorexia, Generalized Anxiety and Schizophrenia (Axis I) and Schizoid, Paranoid and Avoidant Personality Disorders (Axis II) (6, 21).

Pathology with the willful “Odyssean” type, mid-range 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 Anti-social Personality Disorders (Axis II) (6, 21).

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, e.g. Dissociative Identity Disorder, Fugue, Amnesia, Somatization, Conversion, Depersonalization, Post-Traumatic Stress Disorder (Axis I) and Histrionic Personality, Dependent Personality Disorders (Axis II) (6, 21).



(6)



(6)

We can now look back at some of the first attempts by the profession to measure hypnotic ability and understand some of the confusion which was generated. The subjects were college students; the settings were research laboratories (11). The research paradigm was based on linear logic. Psychological phenomena were divided into segments which were then measured as individual sensory-motor responses. By doing that, significant aspects were overlooked. The complexity of the whole person was missed and the impact of the clinical context was ignored.

Gerald Edelman, the Nobel Prize winner in physiology, reminds us that there are essentially “two main modes of science – logic and pattern recognition” (20, 23). The logic mode is relevant for the hard sciences, but when applied in areas of subjectivity, the psychological and consciousness research, it has led to what Lawrence LeShan (24) 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. Pattern recognition is a holistic approach which permits us to assess both the mind-body connection and the clinical context.

Drawing from the work of Mihaly Csikszentmihalyi (25), 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 (25). 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 by the HIP. In the presence of some forms of pathology, the expected flow is disrupted. These differences are reflected in differences in brain circuitry as well.

Another way to conceptualize this is Joseph LeDoux’s (26) 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 (26). 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 re-enforcement, the electrical charge at the synapses forms circuits which eventually become enduring. “What fires together, then wires together” (27). 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 highly hypnotizable individuals are instructed to see color when looking at black and white patterns, there are changes in neural circuitry which 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 (28). 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 psycho-social stresses and biological problems can reverse or interrupt the integration of systems which effect consciousness and flow.

Research with open-heart surgery patients found an association between measured trance capacity and recovery responses (29). Post-surgery, in the Intensive Care Unit (ICU), the blood pressure of the highs was significantly more labile than the mid-range and lows. Since emotion is the dominant feature of the highs, this resonates with Le Doux’s (26) concept that “emotional arousal has powerful influences over cognitive processing.” The high’s, who favor affect over cognition, experienced the external stimuli of the ICU as alarming – thus labile blood pressure. This demonstrates the interaction

between environmental stress and the brain circuitry of the highs is more pronounced as compared to the mid-range and the lows.

This study was replicated with burn patients and showed increased vulnerability with the highly hypnotizable patients as compared to the mid-range and the low's using different measures (30). 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 (11, 14, 15, 31, 32, 33, 34, 35).

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. Antonia Damasio's work (36) 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, then into an "autobiographical self" which is psycho-social (36).

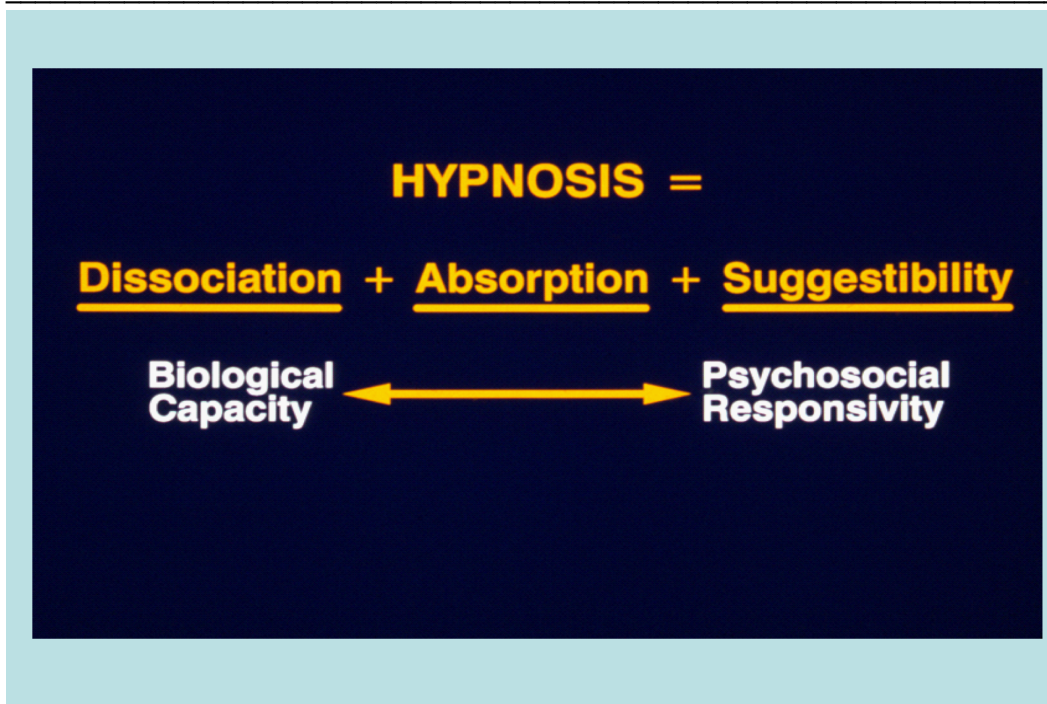
"The proto-self is a coherent collection of neural patterns which map, moment by moment, the state of the physical structure of the organism in its many dimensions. This endlessly maintained first-order collection of neural patterns occurs not in one brain place but in many, at a multiplicity of levels, from the brain stem to the cerebral cortex, in

structures that are interconnected by neural pathways. We are not conscious of the proto-self" (36).

This complex circuitry involves spinal cord pathways, the trigeminal nerve – which includes the ocular motor muscles as reflected in the ER (13) - 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 perceives this neural underpinning. This concept resonates with the new era of mind science which emphasizes biological perspectives for psychotherapy (20, 23, 26, 37, 38). This is reaching inward to appreciate the wiring circuits.

Definition

Now to formalize a definition of hypnosis as a “**neural trance.**” The neural trance is a genetically determined synchronization of synaptic circuits which express a basic proto-self and coping style. Specific patterns reflect capacity to control imagination, focus attention, with attentive, receptive, concentration. The observable and measurable components are: dissociation, absorption and suggestibility (6, 14, 15, 33).



(6)

- 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-psycho-social 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 highly suggestible person, response to input can be almost compulsively compliant (6, 14, 15, 22).

Defining and measuring these components facilitates more accurate diagnoses of normal personality styles and mental illness (12, 19, 22, 31, 39,40), helps clinicians make more rational choices for effective treatment strategies and maximizes the potential for successful therapeutic outcome (5, 6, 14, 15, 29, 30, 32, 33, 41, 42). The data underscores the importance of pattern recognition, neurological data and clinical observations.

MYTHS:

Also, this definition helps dispel the old myths that: Hypnosis is sleep; it's projected onto someone; it's 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 (43). 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 (44). Women are not more hypnotizable than men (45). To be effective, one does not have to be charismatic – trance inductions can be learned and used by any competent clinician (11,14, 15).

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, the patient can immediately be taught how to initiate a treatment strategy with self-hypnosis. 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'm now calling the Neural Trance. It gives us initial information in the following four different clinical domains: 1) trance capacity; 2) personality style; 3) health – illness; and, 4) therapy choice.

1) First, we can assess the degree of hypnotizability; low, mid-range, high or none.

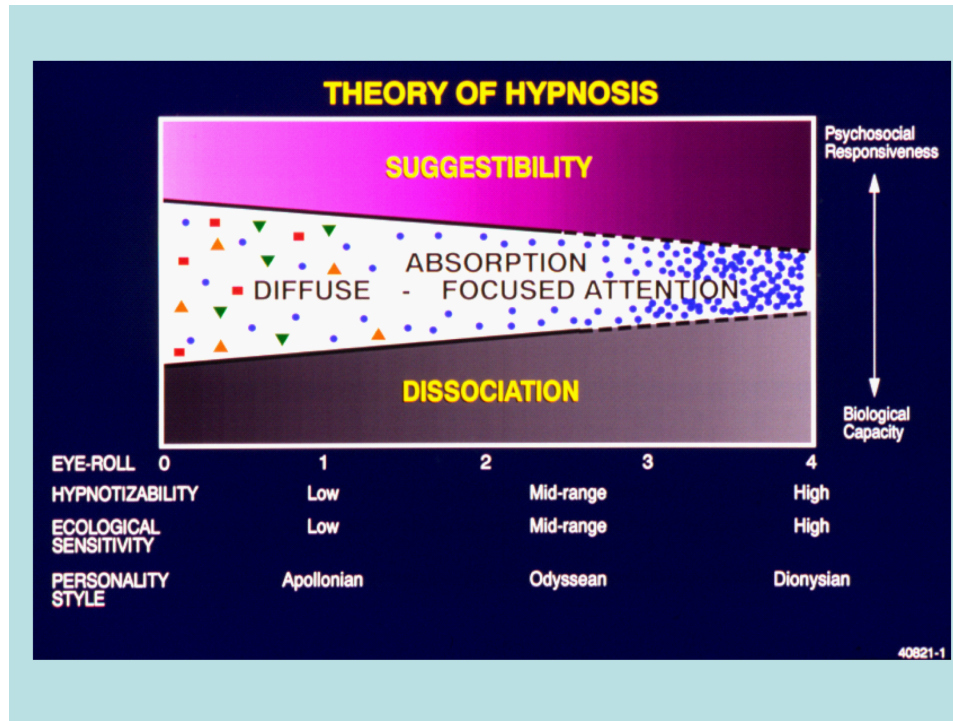
2) Second, we can determine the individual's personality processing style. The process is genetically fixed, in contrast to content, which is influenced by psycho-social factors. Le Doux (26) postulates that; "The basic wiring plan of the brain is under genetic influences....Genetic forces, operating on the synaptic arrangement of the brain, influence, at least to some extent, the way we act, think and feel. "

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 (46). 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. Amir Raz (47) 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.”

Accordingly, biological propensities can be divided into three major categories.



(22)

Highly hypnotizable individuals usually have Dionysian or “heart” features with rich imagination, a trusting stance, deep or total absorption, high suggestibility, compliance, and excellent memory ---the way we feel.

Those at the low end of hypnotizability are likely to be Apollonian or “head” persons with high priority given to logic, reason, orderliness, analysis, critical judgment and the impulse to control---the way we think.

Those in the mid-range reflect varying combinations of the above polarities with trends toward oscillating between periods of relative action and inaction. This is the Odyssean quest for balance –finding the middle way---the way we act. In studies of 91

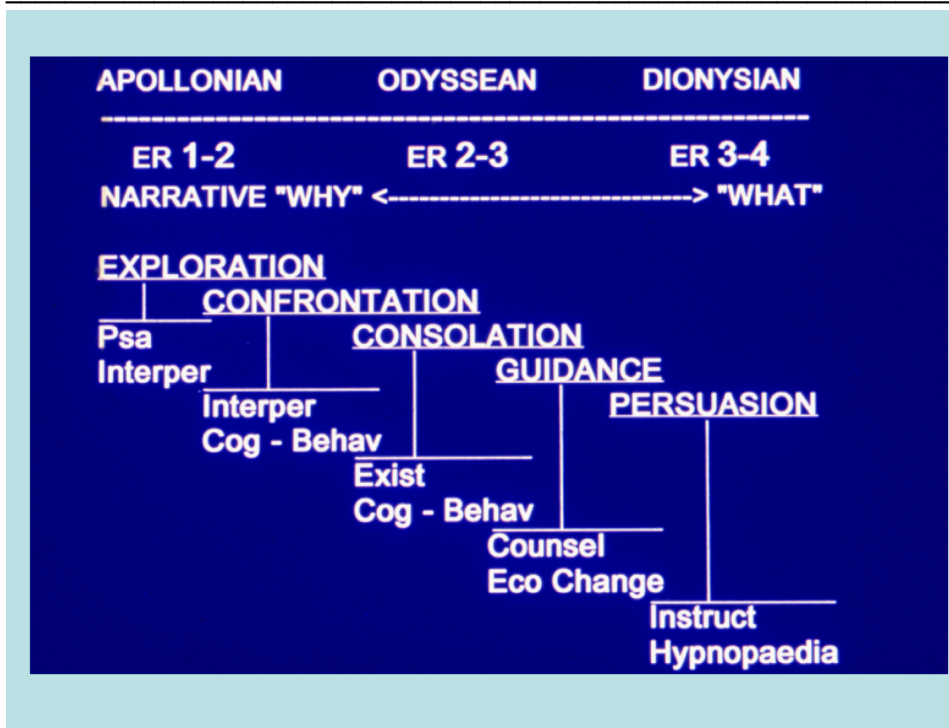
extremely creative persons, this dialectical interaction is pronounced (48). To summarize, the ER reflects the processing style of that person and is a critical feature of what is regarded as personality and self. The Score on the HIP indicates the presence or absence of flow between the biological features and psychosocial variables.

3) 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.

Le Doux's research (26) 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.

4) 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, the model of low, mid-range and high trance capacity corresponds to a range from cognitive to affective mind styles. This gives us a template from which to choose relevant treatment strategies –

from cognitive “why” therapies for those with low ER and “what” therapies for those with high ER.



Those with intact profiles benefit the most from psychotherapy, with medication either secondary or unnecessary.

Those who cannot maintain a flow of concentration and test with non-intact profiles are the most likely to need medication as the primary treatment mode, with psychotherapy playing a secondary role, or none at all.

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” (49). 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 over many 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, and is now acknowledged as: controlled imagination or focused concentration; and, biological circuitry; an expression of an innate capacity or talent; a ribbon of concentration or flow.

These elements reflect a pre-conscious proto-self – an indicator of the basic mind style of the person. The ER - the visible monitor of the proto-self - reveals a spectrum of brain-body interaction that can be assessed with the HIP.

CONCLUSION:

This is my central theme. Why neural trance? We now have a growing knowledge of the underlying neural circuitry that is activated with hypnotic induction. What started as simply a brief (5-10 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 now able to combine the art of clinical intuition with the science of measurement.

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2. Scores 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 "non-intact." 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.