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An Exploration of the Applications of Integrating Quantum Physics with Psychology in Facilitating Novelty to Interrupt Chronic Defensive Patterns

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ABSTRACT

Milton Erickson's toolbox of interventions that interrupted chronic, rigid, and maladaptive patterns of dealing with experience, facilitating unconscious healing processes, have been reviewed and analyzed in a number of sources for decades. This article will explore how these interventions relate to the three levels of hypnotic trance, the implications of these levels in terms of trust, capacity, time and the deeper structures and mechanics operating within the realms of Quantum Physics. The relationship between the interventions employed by Erickson in the February Man case and the Pauli and Dirac matrices underlying the Dirac equation will be explored in terms of yes sets, response sets, containment, the creative focusing of attention, and the appreciation and application of the role of depth in the treatment process. Erickson's consciousness of appreciation with respect to time will be explored in terms of the possibilities of creatively focusing attention to facilitate the activation, development and sustainment of unconscious healing processes. The appreciation of inferences will be applied to the themes of structure, receiving and capacity to support professionals to increase their trust of their capacity to transform resistance into receptivity, and support patient's capacity to increase their trust of the unconscious in the healing process.

Keywords

Novelty, Consciousness, Creativity, Quantum Physics, Spin, Magnetic moment, Yes sets, Structure, Receiving, Time.

Introduction**Evolution of understandings in hypnosis**

The purpose of this article is to deepen the understandings of the pathways for furthering the integration of Quantum Physics with Psychology in the transformation of resistance into receptivity during the treatment process. This will be done by exploring how the appreciation of yes sets and inferences can be applied to the role of the Pauli and Dirac matrices and the interventions of Milton Erickson, M.D. in the February Man case. The Pauli and Dirac matrices functioned as the foundation for the Dirac equation in 1928 which integrated quantum mechanics and special relativity. Erickson's work in the February Man case in 1945 reflected the integration of Erickson's *appreciation* of the steps, consciousness and tools needed to achieve an appropriate level of trance and the skills necessary to achieve those steps. Toward the goal of

appreciating the integration of the above, we will begin with a review of the evolution of hypnosis and the major contributions made over a hundred year period.

The evolution of the understandings and the practice of clinical hypnosis, one of the primary processes for accessing and utilizing *unconscious problem solving* and healing processes, has taken considerable time. For example, the discovery of the unconscious is generally credited to Leibnitz, one of the founders of calculus, along with Newton, in the early 1700s. However, it is known that both Egyptian and Greek ceremonies would use trances for healing and divine connection. The Egyptian rites took place around 3300 B.C. and the Greek rites around 300 B.C. From the early 1700s it took over 200 years for Jung in 1916 to identify the transcendent function, an *unconscious process*, which integrated the conscious and unconscious. Following that, it took almost another 100 years until Kandel won the Nobel Prize in medicine for his work identifying the mechanisms within the hippocampus that drove much of this integration.

These mechanisms validated:

- The need for novelty.
- The importance of the polarity of the old vs. new.
- The capacity of unconscious resources [1-4].

James Braid identified the hypnotic process in 1846, and is considered to be the father of hypnosis as a result. Braid thought hypnosis was a state of sleep, but later recognized that certain hypnotic phenomena like amnesia and anesthesia could be facilitated without sleep. Braid also recognized that unconscious processes could be activated by eye fixation, implying that the focusing of attention was a core variable in facilitating the transformation of consciousness. Janet focused on automatic writing in dealing with dissociations operating as a result of post-traumatic stress [3,5].

Later researchers in the nineteenth century and early twentieth century reflected different views about hypnosis.

- Charcot was the head of the Salpêtrière school and focused on dealing with hysteria and promoted that hypnosis was a passive process.
- Bernheim, head of the Nancy school, took the opposite position, advocating that hypnosis was an active state, driven by suggestion.
- Freud, who studied with both Charcot and Bernheim, dismissed the value of hypnosis, arguing that it didn't support the gaining of insight, or promote long term healing.
- Pavlov, a Russian physiologist, asserted that hypnosis was a physiological state of deep sleep.
- Hull, an American psychologist, conceptualized hypnosis as a psychological stage of deep suggestibility, and involved learning.

Within this process, the identification of hypnotic trance levels evolved in stages. In the 1840s Braid started identifying trance states in terms of physical and neurological responses. Later, in the 1890s Liebeault and Bernheim classified hypnotic trance states into numbered and progressive stages based on physical, behavioral, and subjective responses to suggestions. These included; eye closure, catalepsy and amnesia. In 1931 the Davis-Husband Scale organized hypnosis into 30 specific states, grouped into light, medium and deep stages. In the 1960s Elman further refined this scale with different terms; somnambulism, deep somnambulism, and the Esdaile state. The Esdaile state emphasized and included complete mental stillness, profound relaxation, and natural, non-suggested anesthesia.

These stages are summarized below;

Light trance: Physical sensations include an alternation, often slowing of the breath, and heaviness in the limbs. Psychologically, there is a general reluctance to speak, accompanied by a progressive experience of inner absorption. Hypnotic phenomena include activation of involuntary reflexes, often alteration of eyelid movements, and an increased receptivity to suggestions.

Medium trance; experiences of catalepsy, impaired reasoning, and a deepening of inner absorption. These experiences are often accompanied by anesthesia, and tactile distortions.

Deep trance: eyes can remain open without altering the trance; time distortion and deeply enhanced suggestibility. The hypnotic phenomena include; total blocking of pain, multiple levels of amnesia, age regression that includes dissociation from the present moment, and hallucinations.

Origins of overlap between Quantum Physics and Psychology

The integration of Quantum Physics with Psychology has been evolving for many decades. The collaboration and friendship between Pauli, one of the founders of Quantum Physics, and Carl Jung, the Swiss psychiatrist, who founded depth psychology, placing the healing potentials of the unconscious at the core of the treatment process, is often considered the starting point for this integration [6,7]. Jung's theory of opposites had parallels with Heisenberg's uncertainty principle and Bohr's complementary principle. Jung's appreciation of synchronicity, (the role of time), mirrored the value of time expressed in the Lorentz Transformation, Einstein's Special Relativity, and the Dirac equation [8]. In addition, the principle of synchronicity implied the possibilities of connection which were reflected by the quantum principles of superposition and quantum entanglement. Pauli maintained that quantum mechanics was incomplete and needed the insights of psychology and the utilization of the unconscious to complete itself [7,9].

The core of the integration of Psychology with Quantum Physics, however, can be traced to the work of the French mathematician and physicist Henri Poincaré [3]. In *Science and Hypothesis*, Poincaré identified the relationship between the natural sciences and the *unconscious*. Poincaré recognized that there were four primary stages in the scientific discovery process; preparation, incubation, illumination, and integration. The preparation stage involved *conscious* consideration and *permission* to explore and identify the relevant variables in the issue being addressed. The incubation stage was the allowing of time for the unconscious to process the considerations of the preparation stage. Illumination referred to the output provided by the unconscious, while integration appreciated the need for time to process and digest the results. Poincaré recognized that the unconscious played a fundamental role in the incubation stage, without explicitly identifying what networks of physiological resources/ structures were being utilized. Poincaré wrote;

“There is another remark to be made about the conditions of this unconscious work; it is possible, and of a certainty it is only fruitful, if it is on the one hand preceded and on the other hand followed by a period of conscious work (stages one and four). These sudden inspirations (stage 3) never happen except after some days of voluntary effort which has appeared absolutely fruitless, and whence nothing good seems to have come, where the way taken seems totally astray. These efforts then have not been as sterile

as one thinks, they have set a going the unconscious machinery (stage 2/incubation) and without them it would not have moved and would have produced nothing.

The subliminal self is in no way inferior to the conscious self; it is not purely automatic; it is capable of discernment; it has tact, delicacy; it knows how to choose, to divine. What do I say? It knows better how to divine than the conscious self, since it succeeds where that has failed.”

As such, Poincare’s insight and *trust of the unconscious* predated Jung’s recognition of the unconscious’ healing capacity, which Jung organized around the role of the transcendent function [2,3]. Further, in summary, Poincare was implicitly recognizing the value of permission, *depth*, the role of polarities, and the partnership needs between the conscious and the unconscious minds. These four themes were consistently evidenced by Milton Erickson’s consciousness of appreciation as we shall see shortly.

Around the time Poincare was recognizing the value and capacity of the unconscious and the necessity for trusting it, he was making the corrections to the Lorentz transformation. Poincare’s corrections of the Lorentz transformation were done in 1905 and were important contributions to the development of Quantum Physics.

Erickson’s Resistance Protocol [10] provided the major clues for the integration of Psychology with Quantum Physics. Erickson’s consciousness of appreciation allowed him to recognize the value of the quantum variables and concepts and how to integrate them in the creative focusing of attention within the context of trusting the unconscious and its resources, as Poincare had identified in 1905. This was done without ever explicitly thinking in terms of quantum physics, but from appreciating the variables fundamental to transformational processes. Detailed examples of Erickson’s applications with discussion will be provided in pp. 22-24 of this article.

Further efforts toward the integration of Psychology and Quantum Physics have included:

- Mindell [11] stressed the role of the shamanic perspective and appreciation of ‘dreaming’ in the integration of psychology and physics, while contrasting the perspectives of classical physics and quantum physics. Mindell appreciated the possibilities mathematics contained, implicitly incorporating aspects of relativity, multi embedded metaphors and indirect associative focusing [12,13] for facilitating the transformation of consciousness [14].
- Goswamy [15,16] emphasized the role of creativity and the appreciation of a consciousness of non-locality which reflected quantum states of interconnectedness.
- Rossi and Rossi [17] identified how the interference patterns in self-reflective dreaming were similar to the interference patterns of the double-slit experiment for electrons. Rossi and Rossi also noted how Bayesian probability and its application

to quantum physics was very similar to the concept of expectancy in hypnosis.

- Wolf [18] emphasized the role of observation in the measurement process by noting the impact on neurobiological processes. Wolf neglected to recognize the role of the consciousness of the professional in the focusing of attention around what was attended to and responded to, which we will see was the core variable operating within Erickson’s Resistance Protocol.
- Hunt [19] argued that focusing on the effects of quantum conditions (micro level) on human experience was significantly incomplete as it ignored the effects of the macro level. Further, he was concerned that valuing quantum mechanics could lead to misinterpretations based on the neglect of physical processes on subjective experience.
- Allori [20] argued that consciousness was not required to solve the observation problem of quantum mechanics by citing two theories whose mathematics did not require observation. An additional point was that mind-body issues needed to be addressed from a third dimensional perspective.
- Nwanegbo-Ben [21] took a similar perspective to Goswamy, asserting that consciousness occupied the fundamental position in reality, which has also been advocated by the mathematical perspective of Merrill-Wolff [22] and the Tibetan Buddhist perspective [23]. He emphasized the importance of appreciating the implications of quantum entanglement with respect to one’s relationship with energy, implying the value of the implications of the various energy equations.
- Bondarev, V. [24] echoed the position that consciousness was primary, and fundamental, implying that the consciousness of the observer was a critical variable in the processes of learning about natural laws.

Milton Erickson and the effectiveness of indirect suggestion

Erickson published his first article on hypnosis in 1932. His early writings focused on experimental studies exploring the phenomena that could be facilitated through hypnosis. These included; sensory and perceptual changes; amnesia, age regression, automatic writing, and hypnotically induced deafness, blindness and color vision. These phenomena implied;

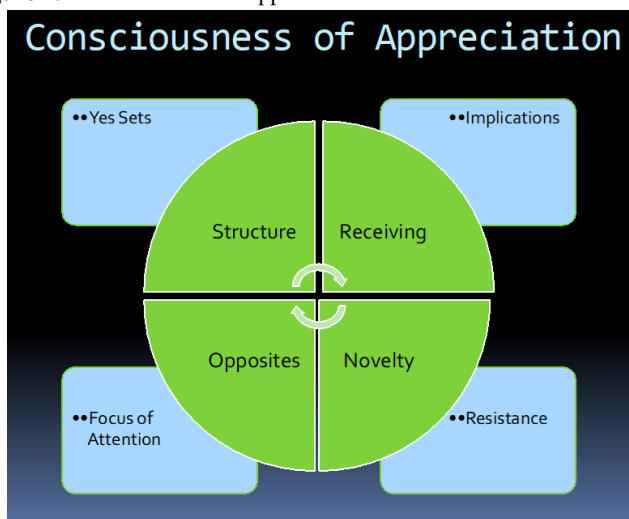
- The *capacity* of the unconscious, which included the *capacity* for learning.
- The appreciation of the dynamics relative to the transformation of resistance into receptivity.
- The need and value of time.
- The need for the consciousness of appreciation.
- The need for creativity in focusing attention.
- The appreciation of the needs for depth and safety.
- The value of receiving.
- The importance of recognizing the distinctions between conscious and unconscious processes, learning to connect with, and trust the unconscious.

While being strongly influenced by Hull, Erickson learned rigorous experimental procedures. In spite of the value of the procedures,

Erickson had objected to Hull's rigid standardized methods, arguing that each patient needed to be treated as an individual. Toward this end Erickson would develop individual treatment plans for each patient [25] and would *utilize* each patient's experience to contain underlying layers of resistance in order to enhance receptivity through *validation* and a refocusing of attention. The central theme around the enhancing of receptivity was to support the patient's access, connection, trust, and valuing of the unconscious and its resources. The essence of this is facilitating a 'yes set' for the unconscious, which meant the patient felt safe, trusted, and valued the theme, which in this case was the patient's relationship with his or her unconscious. Erickson would complement the establishment of a 'yes set' with developing response sets [26] which meant helping the patient to be more responsive. This was accomplished with the tools of confusion, pacing, metaphor, and indirect associative focusing to further depotentiate the conscious mind and facilitate unconscious search and regulatory processes. This became known as the utilization approach [27]. In addition, Erickson objected to Hull's only seeing hypnosis as a passive process from the patient's perspective. Erickson took the long standing debate over whether hypnosis was an active or passive process a step further, showing that hypnosis was both an active and passive process. He integrated both perspectives with his naturalistic, utilization method that incorporated a wide range of indirect suggestions. Further, he identified that direct suggestions often increased resistance, while indirect suggestions had the opposite effect [25,27,28]. The indirect suggestions had the effect of interrupting chronic, dysfunctional patterns and facilitating unconscious searches, learning and healing processes.

Erickson's consciousness of appreciation allowed him to recognize the *value of receiving*, which included its role in shifting the patient's experience to the present by focusing on the progression of receiving from the initial stage of relaxation, through the deeper experiences of comfort, enjoyment and delight [27]. Figure 1 below organizes many of the fundamental variables that Erickson appreciated.

Figure 1: Consciousness of Appreciation.



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Erickson's repertoire of indirection suggestions completed the other side of the polarity between direct and indirect suggestions, while providing a series of implications that were transformative to the understanding of the treatment process. These implications were driven by Erickson's *appreciation* of the implied directive, which can be understood in mathematical terms as a subset of the set of all inferences. His approach rested on two core implications; trust the unconscious, and, *recognize, value and utilize inferences* in the facilitation of unconscious problem solving and healing processes. When an inference is recognized, understood, and appreciated, a professional has more information to support creative choices in *focusing attention in different directions*. The consequence of this is to interrupt chronic dysfunctional patterns and activate unconscious searches. Inferences are the driving force behind the effectiveness of the interspersal approach, one of the key indirect suggestion tools. Erickson referred to inferences as 'the implied directive'. It bears noting that the utilization of inferences lies at the foundation of mathematics, which is the backbone of classical and quantum physics. Erickson's perspective on the role and value of the implied directive is below;

'An understanding of how Erickson uses implication will provide us with the clearest model of his indirect approach to hypnotic suggestion. Since his use of 'implication' may involve something more than the typical dictionary definition of the term, we will assume that he may be developing a special form of 'psychological implication' in his work. For Erickson, psychological implication is a key that automatically turns the tumblers of a patient's associative processes into predictable patterns without awareness of how it happened. The implied thought or response seems to come up autonomously within patients, as if it were their own response rather than a suggestion initiated by the therapist. Psychological implication is thus a way for structuring and directing a patient's associative processes when they cannot do it for themselves. The therapeutic use of this approach is obvious. If patients have problems because of the limitations of their ability to utilize their own resources, then implications are a way of bypassing these limitations' [29].

When Erickson is referring to a patient's associative processes he is referring to the resources of the unconscious, specifically in the hippocampus, for problem solving and learning something 'new'. This is why the appreciation of novelty, and how to activate it, is so essential. When he is referring to; 'when they cannot do it for themselves', he is expressing his consciousness of appreciation of dependency dynamics, which have been identified in detail by Tibetan Buddhism [23,30]. This appreciation of dependency dynamics leads to the consideration of, specifically, what is the patient dependent on me for?

Core inferences include:

- An acknowledgment of the power of resistance.
- The structures of language could be utilized to transform resistance.
- Trusting the unconscious in terms of safety and capacity is a

core component of the healing process.

- The appreciation of opposites, and the networks of resources designed to support their integration and new learning (activity dependent gene expression).
- Receptivity implies the value and capacity for receiving.
- Receptivity implies the needs for safety and depth.
- Receptivity implies the need for sensitive attention and the value of focusing.

Figure 2 identifies many of the pairs of opposites Erickson utilized in the treatment process to support unconscious healing processes.

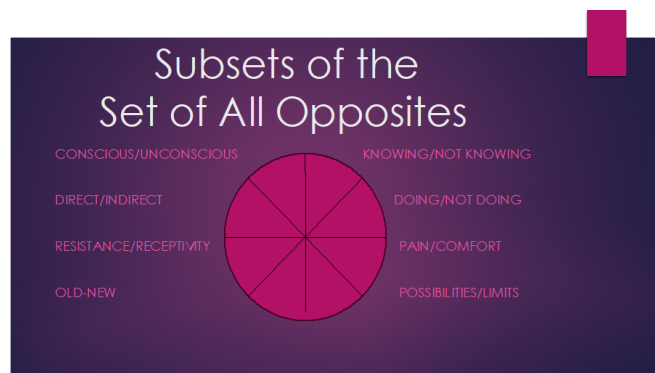


Figure 2: Subset of Set of all Opposites © 2017 Bruce Gregory, Ph.D.

One additional way Erickson's perspective on inference can be utilized is by recognizing that Erickson was communicating; trust the unconscious and its capacity to *receive*, and respond in ways that are consistent with the patient's treatment goals. Perhaps Erickson's trust of the unconscious and the resource networks for receiving was facilitated partially by his medical training which exposed him to literally trillions upon trillions of resources active within the unconscious that Rossi identified in detail [3,31,32]. Two primary examples of the receptor networks are the networks that support the functioning of the lipid membrane and those that support the combining of molecules. In terms of a structural hierarchy for receiving, the following list provides a summary of the many key levels to the receiving process in terms of structure.

- Senses: eyes, ears, nose, mouth, skin.
- Bones.
- Spine
- Organs
- Cells
- Molecules
- Atoms
- Quantum particles
- Nature

We will see shortly that this trust of the unconscious and its capacity lies at the core of the overlap between Quantum Physics and Erickson's treatment methodology.

In terms of trusting the unconscious, two primary implications were;

- You can learn to trust the unconscious.
- Learning to trust the unconscious takes time.

Within the two above inferences and the levels of receiving is the inference that the appreciation and utilization of depth is important. The appreciation and utilization of depth was one of the primary aspects of the February man case that made it unique and a template for the development of broader therapeutic processes.

To support his utilization of depth, Erickson would often use the learning set, emphasizing the stages in learning to read and walk, and would eventually transfer this to the control of involuntary physiological processes, such as blood pressure, heart rate, skin temperature, gastrointestinal activity, and pain perception. Examples for reading and walking are below.

"When you first went to kindergarten, grade school, this matter of learning letters and numerals seemed to be an insurmountable task. To recognize the letter A, to tell a Q from an O was very, very difficult. And then, too, script and print were so different. But you learned to form a mental image of some kind. You didn't know it at the time, but it was a permanent mental image. And later on in grammar school you formed other mental images of words or pictures of sentences. You developed more and more mental images without knowing you were developing mental images. And you can recall all those images" [29].

"You don't know how you learned to stand up. You don't even know how you walked. You can *think* that you can walk in a straight line six blocks-with no pedestrian traffic. You don't know that you *couldn't* walk in a straight line at a steady pace!

You don't know what you do when you walk. You don't know how you learned to stand up. You learned by reaching up your hands and pulling yourself up. That put pressure on your hands-and, by accident, you discovered that you could put weight on your feet. That's an awfully complicated thing because your knees would give way-and, when your knees would keep straight, your hips would give way. Then you got your feet crossed. And you couldn't stand up because both your knees and your hips would give way. Your feet were crossed-and you soon learned to get a wide brace-and you pull yourself up and you have the job of learning how to keep your knees straight-one at a time and as soon as you learn that, you have to learn how to give your attention to keep your hips straight. Then you found out that you had to learn to give your attention to keep your hips straight and knees straight at the same time and feet far apart! Now finally you could stand having your feet far apart, resting on your hands" [28].

In terms of the time parameters for learning, Ebbinghaus' learning curve, Rossi's presentation of the three different time parameters for gene expression, and Kandel's work with the sequences supporting long term memory consolidation in the hippocampus all provide the *scientific validation* for how time functions in learning processes [4,33,34]. It should be noted that presentation of the three different time parameters for gene expression, immediate,

intermediate, and long term, infer and validate the role and value of depth.

An additional, a deeper inference bears noting; Erickson was implying and demonstrating that the consciousness of the professional, and the professional's ability to creatively focus attention was more fundamental than the suggestions themselves. This he demonstrated in his resistance protocol article published in 1964 [10].

In terms of set theory, some of the major subsets of what is being trusted are shown in figures 3-6.

Development of Trust

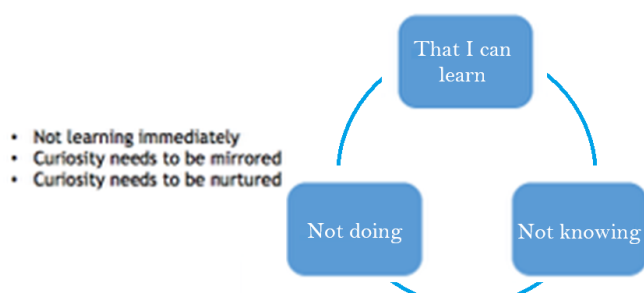


Figure 3: Development of Trust. ©2011 Bruce Gregory, Ph.D.

Reorientation of Trust



Figure 4: Reorientation of Trust ©2011 Bruce Gregory, Ph.D.

Trust Level Four – Quantum Variables

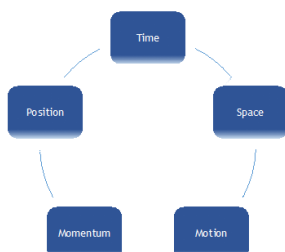


Figure 5: Trust of Quantum Variables. ©2017 Bruce Gregory, Ph.D.

EVOLUTION OF TRUST

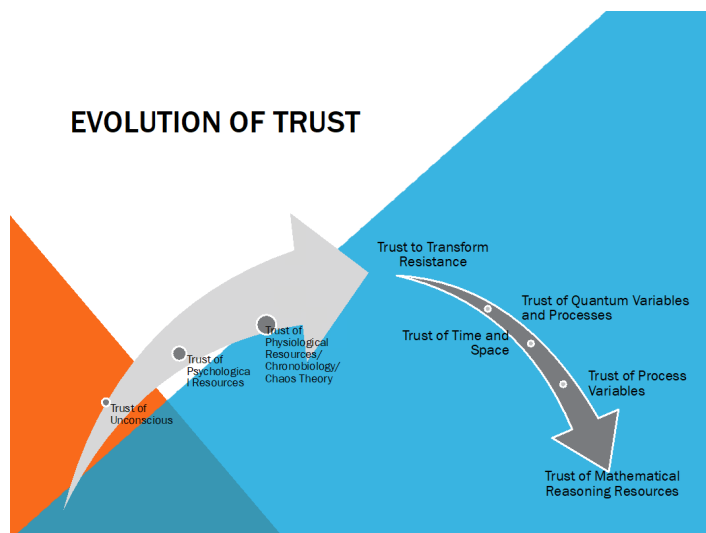


Figure 6: Evolution of Trust ©2020 Bruce Gregory, Ph.D.

Erickson's work with the unconscious in facilitating transformations within patients was a function of his appreciation and application of yes sets [27].

Implications of the establishment of Yes Sets include;

- The issue has value.
- The value has been recognized and integrated by the unconscious.
- There exists potential for gene expression and new forms of comfort.

When a yes set is established, one of the initial resulting implications unfolding are that the yes set can lead to the *trust* and *appreciation* of the resource/theme (i.e. not knowing, unconscious, learning, curiosity, inference, waiting, etc.) being added to the yes set file.

Erickson's work in the February man case

The treatment for the February man case was done in 1945 when Erickson was in the early stages of his career. The treatment was four sessions in total. The patient was a young woman nurse who had chronic depression and a severe water phobia. The case has stood out for decades predominantly from it highlighting the *depth* and range of Erickson's consciousness, skills, and creativity. By developing rapport and trust with the patient, facilitating the patient's connecting and learning to trust her unconscious Erickson was able to facilitate safe states of age regression that he inserted himself into to provide stability, reframing of old experiences, new opportunities for learning for deals with a variety of traumas and fears differently. In the first stage Erickson spent considerable time facilitating the patient connecting to, feeling safe, and trusting the unconscious and Erickson's ability to be sensitive to her needs.

He demonstrated a variety of skills and levels of appreciation throughout the detailed transcripts of the sessions. These included;

- Indirect suggestions
- Conversational approach

- Double negatives
- Depotentialization of conscious mind functioning
- Age regression
- Time distortion
- Learning set
- Creative focusing of attention
- Atmosphere of play and puzzle solving
- Remembering and forgetting/amnesia
- Confusion technique

Throughout the sessions Erickson's conversational approach, communicated through an atmosphere of play and puzzle solving, was complemented by the utilization of the confusion technique and automatic writing to nurture the connection with the patient's unconscious, interrupt chronic dysfunctional patterns and consistently stimulate unconscious processing. The conversational approach significantly decreases any pressure the patient might feel to perform, while providing extensive opportunities to assess receptivity and responsiveness. The utilization of the theme of gaining new understandings and the learning set further reinforced the patient's trust in her unconscious and its capacity for problem solving. Implications here included;

- I can learn.
- My unconscious is safe, can support, and is competent.
- I can feel safe.

A clear example of Erickson's utilization of the conversational approach is below;

"Would you like to learn how to move your hand rapidly? I would like to have you practice moving your hand freely and easily and comfortably. It is very easy, isn't it. Now suppose you show me how to make other movements of the hand ease and comfort. Now finger movements. Do you ever take off your ring? Now keep sleeping but take it off and slip it back. Don't take it off-just half way off. Now slide it back. Now you can move both hands freely and comfortably. Now another thing-you can take this pencil and write your own birthday. Not the year, just the day. All right. Now write it backwards. That's a rather difficult task to accomplish so quickly. Do you often do that? Would you like to try something else?"

Erickson utilized curiosity to seed the patient's capacity, validate the range of unconscious resource networks, and the possibilities contained within a relationship with one's unconscious. Then he reinforced capacity, while nurturing the patient's receptivity and responsiveness [26]. Once the responsiveness was sufficiently established, he transitioned to writing backwards, a process that indicates a deeper level of the conscious mind surrendering control to the unconscious, which implies a deepening of trust in the unconscious, the capacity for learning, and the value of depth. Erickson finishes this interaction with more nurturing and reinforcement of the responsiveness of the patient.

However, more important than the skills utilized above, and the appreciation of them as tools in facilitating unconscious healing processes, that include activity dependent gene expression, was the

manner and pace of Erickson's interventions. It is something that can't really be captured in a transcript. Only from video recordings of his work can this be appreciated. He was in no rush, ever. His pace, and his pacing had no pressure. This implied that his internal state was more important than what he did, and what skills he utilized doing them. Further, this implied a deep appreciation of the role of time, and one's relationship to time. Primary message: there is time, there is enough time, and we can make use of it, creatively. One example of Erickson's trust and appreciation of time was the amount of time he took to establish and reinforce the *age regression* of the patient, which included many, many creative repetitions of the age regression experiences. Throughout, his attitude was playful, and one of interest. An example of Erickson's consciousness and valuing of time is below.

"But somehow or other you will realize that you are safe, that you are secure, that there is somebody you know and trust, and whom you can recognize who will be with you, with whom you can talk, with whom you can shake hands. And you learned to shake hands when you were very young. You saw big people shake hands, did you not? It's awfully hard to remember the first time you ever shook hands. It is very hard to remember that-the day after having shaken hands for the first time. And if you forget a number of things that have happened to you since the first time you shook hands, you really get closer and closer to that memory, will you not? Now I would like to have you make a guess. Do you suppose you know what month it is right now?"

Subject: February. (It was actually March, indicating the subject was in a regressed state)."

Erickson linked safety to the issue of shaking hands. Then Erickson took time, and truisms, and 'did you not' to reinforce the experiential learnings from the past, and activate memories from the past. Then he validated the difficulty with remembering, and complemented it with the utilization of the forgetting/remembering polarity. He then linked that to a contingent/ indirect suggestion for initiating the age regression, reinforcing it with 'will you not', which enhances responsiveness. Finally he asks her to make a guess, which reveals her age regression. What you don't get to see from the transcript, is what Erickson is seeing in the patient's responses as he is speaking, pacing, and directing attention. Erickson was observing the patient's eye fixation, the physiological changes in her breathing and muscular responses, and from his consciousness of appreciation, recognizing the value of the patient continuing to receive more and more, while going deeper and deeper into connection with her unconscious and its resources.

Deeper Implications:

- Receiving implies safety and trust, and can be utilized to deepen the experience.
- Safety implied by depth, age regression, time distortion.
- Capacity can be utilized to lessen anxiety related to psychodynamic issues.

- Possibilities can be appreciated and utilized to reduce pressure.
- Appreciation of time can be a bridge to utilizing time distortion, age regression and pacing.
- Depth implies trust, safety, the need for time, and access to deeper healing structures.
- You can travel through time, your unconscious has the resources, and traveling through time provides access for broader learning and healing.

These deeper implications highlight the capacity of unconscious problem solving and healing resources, functioning in relationship to depth. The specific tools utilized at deeper levels were age regression, time distortion, amnesia, and hallucination. The bridges to the depth were conversational focusing of attention, the confusion technique, double negatives, and the direct suggestions to sleep, and sleep deeper and deeper. The depth was achieved by Erickson taking the time to guide the patient patiently through the stages of developing the age regression state. These steps included; taking the time to separate the conscious from the unconscious, orienting in the present before going to the past, utilizing confusion to enhance receptivity and responsiveness, utilization of amnesia to appreciate needs for safety, and validation of the regressed state. Erickson's occasional and periodic direct suggestions was another way of communicating to professionals that there can be a balance between indirect and direction suggestions; that it was not, and is not an either/or dynamic. Important to appreciate also is that the direct suggestion of; sleep, and sleep deeper, is not to be taken as literal sleep, but that the conscious mind will sleep, so that the unconscious resources will have less interference, and be able to work more efficiently and fluidly.

The scientific support for Erickson's work lies in the heart of the foundations for Quantum Physics which are the matrices of Dirac and Pauli. Their role and implications are discussed in the next section below.

Quantum Physics and the roles of the Pauli and Dirac Matrices

Quantum Physics is the area of physics that deals with the microscopic features of the universe and life, by focusing on the behavior of the fundamental particles and the *implications* of their applications. The primary discoveries in Quantum Physics came from the exploration of the hydrogen atom and the electron around it. The foundations for Quantum Physics are generally attributed to the work of Planck, Einstein, Bohr, and de Broglie. Max Planck is considered the father of Quantum Physics for his work done in 1900 on black body radiation. Planck discovered that the energy released from black box radiation came in discrete, not continuous, packets called quanta. This laid the foundation for quantum mechanics. His work was highlighted by the equation; $E=h\nu$, with h being the Planck constant and ν standing for frequency. Planck received the Nobel prize in Physics for his work in 1918. The equation, like Maxwell's, Bohr's equation for the quantum condition and the Lorentz Transformation, contained a series of implications for psychotherapeutic treatment, primarily around sources of comfort, the depths from which they were being generated, the facilitation

of novelty, and the utilization of opposites.

These implications included;

- The small, or micro, has value.
- Structure has value.
- Waves have value.
- Structure and waves are subsets of the sources of comfort.
- Curiosity about the sources of comfort can lead to new learning and new comfort.

These applications will be discussed in the integration section, and the section containing the Erickson Resistance Protocol [35].

Einstein expanded quantum theory in 1905, describing the photoelectric effect which viewed light as a particle, not as a wave as Maxwell had shown. In 1913 Neils Bohr discovered the quantum model of the atom, in which he identified the dynamics of the electron orbits. Bohr discovered that electrons emitted and absorbed light in discrete amounts when they changed orbits, either going further out from the nucleus, or closer to it. The work of de Broglie in 1924 completed the first stage of development of Quantum Physics. In 1924 de Broglie showed that all matter was composed of waves, implying that the electron was also a wave. De Broglie won the Nobel Prize for this discovery in 1929. His work established that $\text{Lambda (wavelength)} = h/p$, with h standing for the Planck constant, and p representing momentum. The equation demonstrated a connection between momentum, which is associated with particles, and wavelength, which is associated with waves. This equation provided the basis for the Schrodinger equation [36,37]. These scientific discoveries implied that having *yes sets* for them, the quantum variables, concepts and themes, would provide opportunities for introducing novelty, interrupting chronic dysfunctional patterns, and activating unconscious search programs that could be utilized to facilitate new learning.

Quantum Physics was developed in the 1920s by Schrodinger, Heisenberg, Pauli and Dirac. It was developed through the study of the behavior of the electron, one of the fundamental particles of the universe, a carrier of the electromagnetic force, along with the photon. The equations developed identified the key variables and principles operating on the micro level of the universe, revealing main components of the *structure* of the universe at that level. Erickson's *consciousness of appreciation* had allowed him to utilize these variables and principles to creatively *focus attention* even though he never explicitly addressed the equations and what they inferred. In his resistance protocol there are numerous examples of Erickson's appreciation of *the role and value of these variables* as he utilizes them to focus the patient's attention. Some of these examples are below;

"You have come for therapy, you have requested hypnosis, and the history you have given of your problem leads me to believe strongly that hypnosis will help you. However, you state more convincingly that you are a resistant hypnotic subject that others have failed despite prolonged efforts to induce a trance, that

various techniques have been of no avail, and that reputable men have discredited hypnosis for you and as a therapeutic aid in and of itself. You have frankly expressed your conviction that I cannot induce a trance in you, and with equal frankness you have stated that you are convinced that you will resist all attempts at hypnosis and that this resistance will be, despite your earnest desire and effort to cooperate”.

The above quote illustrates that Erickson’s appreciation of resistance included an appreciation that it was a *force with momentum*, that needed repeated doses of *validation* to transform that momentum. Without explicitly referring to it, Erickson indirectly acknowledged one of the implications of the Dirac equation with its incorporation of the *momentum* operator, that recognized its fundamental role in the structure of the universe.

“In other words, I will ask a question to which only your unconscious mind can give the answer, and concerning which your conscious mind can only guess if it does at all; maybe correctly, maybe wrongly, or maybe have only some kind of opinion, but if so, only an opinion, not an answer.

Before I ask that question, I would like to suggest two possibilities. (1) Your conscious mind might want to know the answer. (2) Your unconscious mind might not want you to know the answer. My feeling, and I think you will agree, is that you came here for therapy for reasons out of the reach of your conscious mind. Therefore, I think that we should approach this matter of the question I am going to put to your unconscious mind for its own answer in such a way that your own deep unconscious wishes to withhold the answer or to share the answer with your conscious mind are adequately protected and respected.

Now, to meet your needs, I am going to ask that yes or no question, and be prepared to be pleased to let your unconscious mind answer, and in doing so either to share the answer with your conscious mind or to withhold it, whatever your unconscious mind thinks to be the better course. The essential thing, of course, is the answer, not the sharing nor the withholding. This is because any withholding will actually be only for the immediate present, since the therapeutic gains you will make will eventually disclose the answer to you at the time your unconscious minds regards as most suitable and helpful to you. Thus you can look forward to knowing the answer sooner or later, and your conscious desires, as well as your unconscious desires, are the seeking of therapy and the meeting of your needs in the right way at the right time.”

“An unconscious mind response is different, because you do not know what it is to be. You have to wait for it to happen, and consciously you cannot know whether it will be ‘yes’ or ‘no’. It does not need to be in accord with the conscious answer that can be present simultaneously in accord with your conscious mind’s thinking. You will have to wait, and perhaps wait and wait, to let it happen. And it will happen in its own time and at its own speed”. In the above Erickson demonstrated an appreciation of the consciousness of group theory by creatively permuting the polarity

between the conscious and unconscious, the polarity between knowing and not knowing, and the quantum variables (time, space, motion, momentum, position, and uncertainty) [38-40]. In terms of set theory, Erickson was appreciating and utilizing subsets of possibilities, which reflect the qualities of superposition in the quantum world, and subsets of transformational structures. In terms of the consciousness of appreciation, Erickson was appreciating all of the above, including the creative focusing of attention, one of the core variables in the transformation of consciousness, martial arts, and classical music theory [34,41]. Erickson’s choices, which were natural consequences of the quality of his consciousness of what he appreciated, reflected parallels with two major components of quantum physics; superposition, and the collapse of the wave function laid out in the Schrodinger equation. The principle of superposition reflects a scientific and mathematical validation of the value and incorporation of ‘infinite possibilities’ in the structure of the universe and life. The logic of superposition had been worked out in 150 A.D. by the Buddhist philosopher, Nagarjuna, in his work, the Madmamayika [30]. The collapse of the wave function is made through observation. Erickson’s *choices of where he focused attention* functioned as the observation collapsing the infinite possibilities of choices that a professional can conceivably make during treatment in any given moment. In terms of treatment value, by trusting and utilizing ‘infinite possibilities’, attention is being given metaphorically to the polarity between hopelessness and hope, one of the core dynamics in the treatment of the depression mood disorders, and the catastrophic thinking component of the anxiety mood disorders.

These examples imply the value of the quantum variables and concepts, demonstrating that they are doorways/bridges to the vast network of unconscious resources. In addition, they imply *the value of depth* as the quantum world operates beyond 10^{-8} . In doing so they also imply the value of the processes and tools that lead to these equations. The Pauli and Dirac matrices represent and reflect the core of these processes and tools.

Pauli and Dirac Matrices

The Pauli and Dirac matrices are key aspects of the two major quantum equations below, the Schrodinger and Dirac equations, figure 7 and 8.

Figures 7 and 8 are the Schrodinger and Dirac equations.

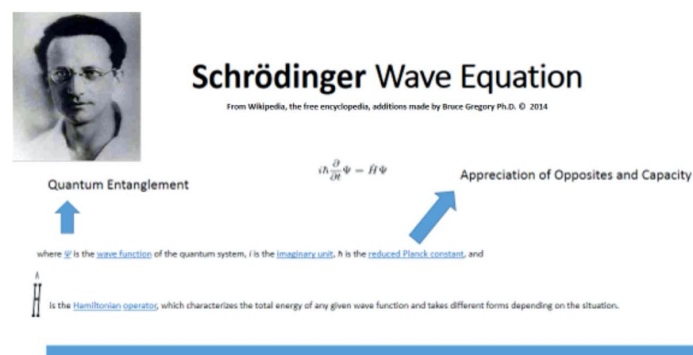


Figure 7: [en.wikipedia.org/wiki/Schrödinger equation](https://en.wikipedia.org/wiki/Schrödinger_equation), August 12, 2014

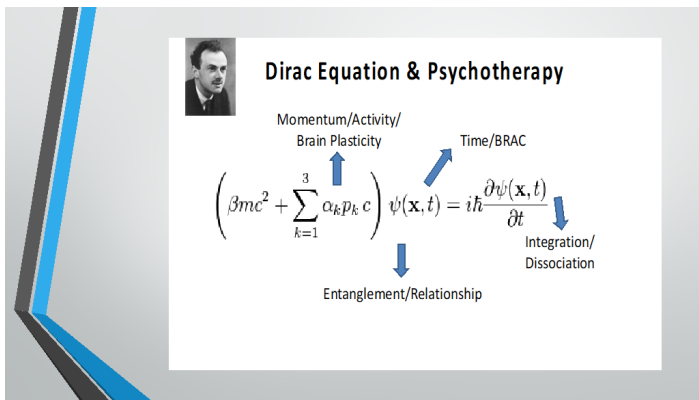


Figure 8: en.wikipedia.org/wiki The Dirac equation, additions by Bruce Gregory, Ph.D.©2014.

While these two equations are recognized as two of the fundamental touchstones of Quantum Physics, as they reflect and represent the variables operating at the deepest levels of the universe, which imply they are sources of comfort at the deepest levels, it is common that mental health professionals do not recognize the mathematical tools/structures that have been utilized to discover these equations. One of the primary structures have been matrices. While matrices are basically rows and columns of numbers enclosed by brackets, processes involving matrices, specifically matrix multiplication, represent and describe *processes of transformation*. One primary example here is that certain matrices describe the rotation of vectors, which basically, in psychological terms, represents the *direction of focus*. Erickson's ability to creatively redirect the focus of attention conversationally was one of the hallmarks of his uniqueness and level of consciousness. In essence, Erickson's consciousness of appreciation can be understood to have functioned as a matrix. From a set theory perspective, matrices can be understood as subsets of the possibilities of transformation. From a mood disorder perspective matrices represent the infinite possibilities of hope. In the case of the above two equations, matrices were one of the primary mathematical tools utilized to discover the equations that described how the structures of the universe worked at the deepest levels in terms of motion and energy.

The Pauli and Dirac matrices, figures 9 and 10, reveal core hidden structures of nature. They are the fundamental building blocks of the Dirac equation. In the equation itself, they are the driving mechanisms behind the Greek letter Beta in front of the Einstein energy/mass/light relation and the Greek Alpha symbol and the p symbol for momentum. Metaphorically, they represent doorways/portals to deep forms of comfort, which imply vast capacities and possibilities of the unconscious and its integrated resource networks for healing. How to utilize the recognition and appreciation of them will be discussed in the integration section. Core primary themes they reflect are:

- Value, appreciation and utilization of structure.
- Function as bridges to the connection between quantum mechanics and relativity.

- Inject more novelty for focusing attention.
- Reinforce the value and need for depth.
- Deeper appreciation of momentum
- Role of spin and its relationships to structure and motion
- Value and implications of magnetic moments

Dirac's equation connected quantum mechanics and special relativity. In doing so, it paved the way for many technological advances that have become integral parts of life, especially in technology areas. Three examples of where the Dirac equation was essential were in the development of PET scans, micro-processors, and lasers. The equation implied the possibilities of enhancing experiences of connection, one of the primary themes behind the many symptoms of mental health issues. Connecting patients to the vast network of unconscious resources was one of the main components of Erickson's work that was distinct from other therapeutic healing approaches.

The Pauli Matrices

$$\sigma_1 = \sigma_x = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$$

$$\sigma_2 = \sigma_y = \begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix}$$

$$\sigma_3 = \sigma_z = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$$

Figure 9: Pauli Matrices. (2026, Aug. 25). In Wikipedia.wikipedia.org.

The Pauli matrices were two dimensional and added the role of spin to the Schrodinger equation. The Schrodinger equation, while providing the location of the electron, did not provide the additional information contained in the Pauli matrices above, which include the spin, or angular momentum of the electron. This motion of the electron would be called up or down, depending on how it was interacting with the magnetic field it was operating in. If it was in alignment with the field, it was called spin up, if not, spin down. By providing more information, the Pauli matrices were adding to the implications of the value of structure and depth, and adding to the possibilities of discovering new forms of comfort. The electron's interaction with the magnetic field was identified as the magnetic moment. The significance of the magnetic moment was that it represented another level of depth for the sources of comfort; in this case the magnetic field being the next level of depth [8,43,44].

The Dirac matrices are in Figure 10.

- $\gamma^0 = [[1, 0, 0, 0], [0, 1, 0, 0], [0, 0, -1, 0], [0, 0, 0, -1]]$
- $\gamma^1 = [[0, 0, 0, 1], [0, 0, 1, 0], [0, -1, 0, 0], [-1, 0, 0, 0]]$
- $\gamma^2 = [[0, 0, 0, -i], [0, 0, i, 0], [0, i, 0, 0], [-i, 0, 0, 0]]$
- $\gamma^3 = [[0, 0, 1, 0], [0, 0, 0, -1], [-1, 0, 0, 0], [0, 1, 0, 0]]$

Figure 10: The Dirac Matrices. (2026, Aug. 25). In Wikipedia.wikipedia.org.

The Dirac matrices came about from Dirac's quest to integrate quantum mechanics with special relativity. There were a number of key steps Dirac took in the process of discovering them. While the mathematics component of this process is advanced, and can be quite intimidating, it is important to focus on the psychological implications, the application possibilities, and the role of *yes sets* in the treatment process. Dirac correctly assumed that he needed a linear equation as a result of two factors. The first was that the Schrodinger equation was first order in time, but second order in space, making it incompatible with Einstein's special relativity. The second was that the Stern Gerlach experiment was second order in both space and time, which led to logical contradictions and negative probability densities. To satisfy the mathematical requirements for a linear equation, normal numbers would not work. Only matrices would, as they could use 'anti-commutators' to satisfy the requirements. While the Pauli matrices worked for three dimensions, they would not work for four dimensions, which required Dirac to identify the four X four dimensional matrices that would work [8,14].

The Pauli matrices [45] did mutually anti-commute, and squared to one, satisfying the eigenvalue requirement. They represent the spin of the electron in a non-relativistic environment. They indicate how the spin interacts with three dimensional space. The Pauli matrices were the building blocks that Dirac used to build his 4X4 matrices. Looking at the structures of both, interesting observations emerge that are accompanied by significant inferences that may overlap with Erickson's work in the February man case. Dirac used the identity matrix, and the zero matrix to complement Pauli's matrices which used combinations of natural numbers and the imaginary across the reverse diagonal.

In terms of yes sets, both Pauli and Dirac represent and support deepening the appreciation of structure. This deepening of the appreciation of structure can support the professional's trust to creative focus attention to produce novelty, and activate unconscious searches, problem solving, and healing processes. The matrices and the Dirac equation are different kinds of structures. As Rossi [32,34] has pointed out, the resources of the unconscious that provide comfort are all structures operating at different levels of depth. One representation of *depth* that conveys this is the progression from the brain to the hypothalamus; then to cells, and then molecules. Finally, the progression reaches the quantum level, in the cases of the Dirac and Pauli matrices, which describe the behavior of the electron. A clear example of how electrons are deep sources of comfort is: There are approximately 36 trillion cells in the human body. Cellular processes operate on deep levels and represent vast amounts of organized intelligence and coordinated network resources. Within each cell there are seven compartments. One of these compartments is called the mitochondria, which are the energy factories within cells. Within each cell there are seven mitochondria, which means there are approximately 252 trillion energy factories within every human being. The energy production process is called the ATP process. A key ingredient of the ATP process is the transfer of one electron from a hydrogen atom to

an oxygen atom. This fact validates electrons as deep sources of comfort.

Depth at a treatment level implies safety and trust. Prolonged suffering, like the nurse had experienced in the February man case, implies the need for deeper forms of comfort. In the February man case one of the primary variables facilitating the comfort and healing was the trust and utilization of time, one of the core considerations involved in the Dirac equation. Another core component of the Dirac equation, that represents a component of structure was the momentum operator, the variable that required the matrices. The momentum of the nurse's suffering and resistance was one of the aspects of treatment that Erickson most appreciated.

Integration

There are many ways to interrupt chronic patterns that have been documented in detail over many decades from a variety of treatment perspectives. Cognitive behavioral therapy [13] utilizes viewing thoughts differently, disrupting negative patterns and desensitization techniques. Jungian therapy uses word association and dream analysis to interrupt patterns, while the object relations/ psychodynamic approach of Masterson emphasized the containment of defenses through challenging defenses to interrupt defensive patterns and facilitate unconscious reorganizing processes [46,47].

What these patterns have in common is that they introduce *novelty*, and activate unconscious processes of exploration, adaptability, learning, and ultimately, activity dependent gene expression. What Erickson did differently was take the time. He didn't just make one comment, but a series of comments meant to additionally reduce conscious processing, while increasing unconscious processing. He took time for getting attention; time for the confusion technique; time to be playful and de-potentiate the conscious mind; time to nurture the learning set; time for understandings; time for utilizing the polarity between forgetting and remembering to complement the polarity and partnership between the conscious and unconscious.

Examples of integrating and applying the themes of depth, structure, and momentum in terms of Erickson's work and the Dirac and Pauli matrices are below. The questions, which can be considered basic accessing questions [32] communicated conversationally, are designed to activate unconscious searches by facilitating novelty. The novelty is achieved through the asking of questions not previously considered and/or thought about.

- How long has this situation been going on?
- Do you realize that given this, there is a significant negative momentum operating that needs to be addressed when redirecting your efforts toward your goals?
- Can you think of one or two steps you could take that would redirect the direction of this momentum toward the direction of your goals?
- Can you tell that your unconscious has some information about some of the resources you could utilize in this effort?

- Have you considered the distinctions between positive and negative momentum, and examples of them in your life?
- Can you remember times in your life where you experienced the pleasure and comfort of positive momentum?
- When you think or consider structure, what three words enter your mind first?
- Have you considered how structure relates to your needs?
- Can you recognize that your unconscious has some information about the relationship between structure and your needs?
- Have you considered the relationship between structure and depth?
- Would you be interested in enjoying new understandings about how depth and structure overlap?

Questions like those above, which can be arranged in a variety of combinations can facilitate unconscious searches that lead to the creation of ‘yes sets’ for the themes of momentum, structure, and depth. These themes are not necessarily restrictive. Applying the appreciation of inference, the themes of position, motion and time emerge naturally, which further imply the possibilities of new forms of comfort available through the exploration of these themes [1-117].

Summary

This article has explored the overlaps between Erickson’s work and the matrices of Pauli and Dirac that support the Dirac equation for the purpose of advancing the creative focusing of attention to facilitate novelty while interrupting chronic, dysfunctional patterns of patients. The primary considerations have been the role of depth, the appreciation of structure, and the role of inferences in science and mathematics, and in the psychotherapeutic treatment process. This has been complemented by an appreciation of time’s role and utilization in the treatment process. Erickson’s use of age regression and time distortion have been recognized as primary tools in reinforcing and demonstrating this theme. The net result has been to highlight how these overlaps support the interruption of chronic, dysfunctional patterns within patients, facilitating novelty, and unconscious healing processes. More research is needed to scientifically validate these overlaps to take their appreciation to a higher, more integrated level.

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