

2010 Edition version 1.2

**THE CREATIVE PSYCHOSOCIAL GENOMIC  
HEALING EXPERIENCE ©:  
ADMINISTRATION, RATIONALE, & RESEARCH  
An Open Invitation to Mind-Body Psychotherapy  
Clinical & Experimental Research**

Ernest Rossi, David Atkinson, Jane Blake-Mortimer, Salvatore Iannotti, Mauro Cozzolino, Stefano Castiglione, Angela Cicatelli, Erika Chovanec, Richard Hill, Claude Viroc, Bhaskar Vyas, Jorge Cuadros, Michel Kerouac, Thierry Kallfass, Helmut Milz, Claire Frederick, Bruce Gregory, Margaret Bullock, Ella Soleimany, April Rossi, Kathryn Rossi, & Stanley Krippner.

David Atkinson, University of Pittsburgh School of Medicine; Jane Blake-Mortimer, University of Adelaide, Australia; Salvatore Iannotti, The Mind-Body Institute, San Lorenzo Maggiore, Italy; Mauro Cozzolino & Stefano Castiglione, University of Salerno, Italy; Angela Cicatelli, University of Naples, Italy; Erika Chovanec, Institute of holistic-motivational Psychotherapy, Vienna, Austria; Richard Hill, Western Sydney University, Australia; Claude Viroc, Emergences, Rennes, France; Bhaskar Vyas, Raopura, Baroda, India; Jorge Cuadros, Grupo Hipnológica, Spain; David Atkinson, University of Pittsburgh School of Medicine, USA; Michel Kerouac, Canada; Thierry Kallfass, Institute of Human Perspectives, Geneva, Switzerland; Helmut Milz, Universität Bremen, Bremen, Germany; Stanley Krippner & Claire Frederick, Saybrook University, USA; Bruce Gregory, Counseling Psychology, Ryokan College, California, USA; Margaret Bullock, Elle Soleimany, & Kathryn Rossi, Milton H. Erickson Institute, California Central Coast, USA.

Address correspondence to Ernest Rossi, Ph.D., Milton H. Erickson Institute of the California Central Coast, USA. Email: [ernest@ernestrossi.com](mailto:ernest@ernestrossi.com).

## INTRODUCTION

*The Creative Psychosocial Genomic Healing Experience (CPGHE)* evolved out of 50 years of exploring Milton H. Erickson's naturalistic and utilization approaches to therapeutic hypnosis, mind-body healing, and psychotherapy. *The Creative Psychosocial Genomic Healing Experience* is integrated with current theory and research in epigenetics (Petronis 2010), functional genomics (Geschwind & Konopka, 2009), bioinformatics, neuroscience, and psychosocial genomics (Atkinson et al., 2010; Rossi, 1972/1985/2000, 2002, 2004, 2007; Rossi & Iannotti et al., 2008; Rossi & Rossi, 2010; Rossi, Vyas et al. 2010). The intriguing breakthroughs that are now taking place on the deep biological level in our understanding of mind-gene communication and healing via our new epigenetic approach was outlined in an enthusiastic manner in recent issue of *Nature* (Nobrega, 2010).

“Gene expression is the cellular process that decodes the genetic information in DNA and converts it into proteins. It is regulated at many levels: when messenger RNA is transcribed from DNA; when mRNA is translated into proteins; and at the epigenetic level, when the structure of chromatin, coils of DNA wound around histone proteins, is altered. Although most discussion of gene expression focuses on the regulation of transcription, the other components of the process are also crucial. Yet little is known about how they are integrated.

Work by Tom Misteli at the National Cancer Institute in Bethesda, Maryland, and his team provides a striking example of the integration of seemingly disparate components in gene-expression regulation (Luco et al., 2010). They describe how patterns of alternative splicing of newly made RNA, a key regulatory mechanism, can themselves be regulated by specific chemical modifications in the chromatin. They also found that a given set of modifications to histones predicts patterns of RNA splicing. The authors conservatively estimate that this mechanism occurs in dozens to hundreds of genes in the human genome.

This remarkable study makes a connection between a quintessential transcription-regulation mechanism, histone modification, and a post-

transcriptional process, alternative splicing. It shows that chromatin can regulate not only how much of a protein, but also which protein, is made in a cell.

We have seen a surge of intriguing studies suggesting that molecules that were thought to regulate transcription also direct epigenetic modifications, modify alternative-splicing patterns and participate in the intracellular transport of RNA. These findings and the work of Misteli and colleagues provide insight into how the components of gene regulation are integrated.” (p. 11)

If we believe that mind-body healing and therapeutic hypnosis is an *ideo-plastic aptitude for transforming an idea into an act in receptive subjects*, we can say that the history of hypnosis has anticipated current research in epigenetics and neuroscience on activity or experience-dependent gene expression and brain plasticity by more than a century (Wetterstrand, 1902). We propose that this epigenetic and molecular-genomic level of discourse is a much needed expansion of our traditional cognitive-behavioral conception of therapeutic hypnosis (Luco et al., 2010). Our new ideo-plastic healing scale, *The Creative Psychosocial Genomic Healing Experience (CPGHE)* could become a standardized way of assessing the molecular-genomic impact of many approaches to mind-body healing (meditation, hypnosis, active imagination, music, etc.) that is consistent with the translational research that is now recommended, supported, and funded by the National Institute of Mental Health (Aiki et al. 2010; Insel, 2009, 2010).

The administration of the *Creative Psychosocial Genomic Healing Experience* as presented here requires about 20-30 minutes. A Scoring Form included here is usually filled out by the therapist but may be adapted for group administration. Considerable research is now required to establish the validity and reliability of this initial version of the *CPGHE* on many levels from the cognitive-behavioral to the molecular-genomic level as outlined in the research section presented below.

This administration protocol and rationale for the *Creative Psychosocial Genomic Healing Experience* is a new therapeutic approach for facilitating

human resilience and resourcefulness for health, healing, and rehabilitation (Rossi et al., 2011, In press).). *The Creative Psychosocial Genomic Healing Experience* facilitates problem solving and healing by activating experience-dependent gene expression to modulate a variety of epigenetic interactions between mind and body that are the essential mechanisms of psychoneuroimmunology, consciousness, creativity, dreaming, memory, learning, and personality transitions via brain plasticity (Atkinson et al. 2010; Rossi, Iannotti et al. 2008; Rossi, Vyas et al., 2010).

We propose that scores and response profiles on the CPGHE will be associated with unique profiles of activity and experience-dependent gene expression (measured with DNA microarrays) and brain plasticity (measured with fMRI, etc.) that can make unique contributions to psychological development as well as personalized medicine and rehabilitation. We outline a series of hypotheses and research proposals in this presentation that now require careful scientific assessment to compare and contrast the CPGHE with other standardized mind-body therapeutic protocols in psychology, psychotherapy, and therapeutic hypnosis. We invite academic and research groups engaged in creative approaches to mind-body healing in alternative and complementary medicine to join us in this open research project on our new Ideo-plastic Healing Protocol: *The Creative Psychosocial Genomic Healing Experience* on all levels from the cognitive-behavioral to the molecular-genomic.

We have documented how our ideo-plastic *Creative Psychosocial Genomic Healing Experience* reduces (1) *dysfunctional inflammation* (associated with chronic pain and delayed healing) and (2) *oxidative stress* (associated with many chronic medical conditions and the ageing process) as well as (3) increasing a “*molecular-genomic signature of stem cells*” (activation of stem cells associated with healing and the rehabilitation and in many tissues of the body) as the deep psychobiological source of human resilience and resourcefulness (Rossi, Iannotti et al. 2008; Atkinson et al., 2010; Rossi et al. 2011, in press).

**THE ADMINISTRATION AND RATIONALE OF THE CREATIVE PSYCHOSOCIAL GENOMIC  
HEALING EXPERIENCE (CPGHE)**

**Introduction: Identify the Initial Stress, Symptom, or Problem**

**Initial Time** \_\_\_\_\_ am pm      **Initial Stress & Symptom: 0% . . .50% . . .100%**

We record the *Initial Time* when *the Creative Psychosocial Genomic Healing Experience* takes place for two reasons. (1) Time of day is an important factor determining when activity or experience-dependent genes are expressed in our normal circadian and ultradian rhythms of the Basic Rest-Activity Cycle (Lloyd & Rossi, 1992, 2008). (2) This initial time is needed to measure of the subject's mental engagement and therapeutic response in their scoring profile presented below.

We record the *Initial Stress or Symptom* to calculate *Stress or Symptom Reduction later in item #10*. *Initial Stress or Symptom* is the subject's subjective estimate before they begin *The Creative Psychosocial Genomic Healing Experience*. The therapist initiates the healing experience with these words.

***“What level of stress (symptom, problem) are you experiencing right now - where 100% is the worst stress level you have ever experienced, 50% is average, and 0% is no stress?”***

**Stage 1: Evoking Observing Consciousness - Curiosity, Focused Awareness, and Positive Expectancy**

**1. Warmer – Cooler? Reality % 0%.....50% .....100%**

Evoking and heightening the subject's *self-observing consciousness* of their own subjective experience during psychotherapy is the hallmark of the *Creative Psychosocial Genomic Healing Experience!* We want our subject to be fully awake and aware of the nuances of self observation, self facilitation, and self healing via their own natural patterns of mind-body communication. Activating the subject's curiosity, focused awareness, and positive expectations of a healing journey is the first step in the Four-Stage Creative Process of

Psychotherapy that optimizes *the Creative Psychosocial Genomic Healing Experience* on all levels from mind to gene (Lloyd & Rossi, 1992, 2008; Rossi, 2002, 2004).

The therapist models the activity-dependent mirroring hands protocol with the palms of her/his hands about 6 to 8 inches apart facing each other at chest level as illustrated in figure 1a. The hands in this initial position function as a metaphor for a safe inner space (temnos) or container within which the person can experience a creative dialogue or drama between symptoms, problems, or issues projected into one hand and the “opposite,” the unknown solution of the problem in the other hand. The solution is unknown because it has not been created yet in the patient. That’s why the person has a problem.

The therapist, of course, does not know at this point what the answer to the patient’s problem is either. Together therapist and patient now embark on a quest for new consciousness that will express a possible resolution of the patient’s issues by exploring what Carl Jung (1923, 1963) called “The Problem of the Opposites.” Awareness of the conflicting opposites within tends to activate a person’s inner resources accumulated from previous life experience that often holds keys for initiating a therapeutic dialogue that may generate new consciousness for a satisfactory resolution of the presenting problem. We have outlined the rationale for exploring the “opposites” in the *Creative Psychosocial Genomic Healing Experience* in the research section below.

Figure 1a illustrates the initial hand position in stage one of our 4-stage creative process via the *Creative Psychosocial Genomic Healing Experience*.

Ask the subject, ***“Which hand seems warmer or cooler?”*** Subjects may sometimes ask therapists what they mean by this question. The therapist simply responds with, ***“Most people don’t realize how their hands and other parts of their body usually feel slightly warmer or cooler when they pay attention to it. This is a good exercise heighten your consciousness and awareness of yourself. It helps activate your focused awareness, creativity, and positive expectation of your natural self healing ability. The simple idea of one***

***hand being warmer or cooler will heighten your actual sensations of warmth and coolness.”***



**Figure 1a: The initial mirroring hand position for stage one of the 4-stage creative process facilitated by the *Creative Psychosocial Genomic Healing Experience* (Rossi, 2002, 2004, 2007).**

After two minutes ask the subject ***“How real, strong or vivid does the feeling in your hands seem to be on a scale of 100% (completely real) to 0% (not real)?”*** (Therapist records whatever “Reality %” the subject reports experiencing.)

Recording this Reality % begins to focus the therapist’s own mirror neurons on subjects and provides an immediate impression of the subject’s level of focused attention, sense of reality, and positive expectancy of *The Creative Psychosocial Genomic Healing Experience*.

**2. Stronger – Weaker? Reality % 0%..... 50%..... 100%**

Ask the subject, ***“Which hand seems stronger or weaker?”*** After two minutes ask the subject, ***“How real, strong or vivid does the feeling in your hands***

seem to be on a scale of 100% (completely real) to 0% (not real)?" (Therapist records whatever "Reality %" the subject reports experiencing.)

### **3. Child – Adult? Reality % 0%. . . . . 50% . . . . . 100%**

Ask the subject, ***"Now let's turn to a personal memory . . . Which hand seems to be you right now - and which hand seems to feel more like you as a child?"*** After two minutes ask the subject, ***"How real, strong or vivid does the feeling in your hands seem to be on a scale of 100% (completely real) to 0% (not real)?"*** (Therapist records whatever "Reality %" the subject reports experiencing.)

This contrast between the present and the remembered past tends to deepen focused inner attention, curiosity, and expectancy on one's self and prepares for stage two of the creative healing experience that follows.

### **Stage 2: Incubation, Past Problem Review to Activate Positive Motivation and Inner Resources via the Activity-Dependent Mirroring Hands Protocol**

The initial position of the Activity-Dependent Mirroring Hands Protocol of the CPGHE Requesting a subject to lower a hand very slowly as they review the origin and history of their problem is a precise way of focusing their attention and expectancy to access the neural networks of their brain that encode their problem, maladaptive behavior, and consciousness (Rossi, 2002, 2004, 2007). These neural networks encode memories that are to be updated by allowing therapeutic processes of activity and experience-dependent gene expression and brain plasticity to operate in an evolutionary adaptive manner (Rossi, Erickson-Klein & Rossi, 2008).

#### 4. Problem & Opposite Reality % 0%.....50%.....100%

Ask the subject, ***“Which hand experiences your issue (concern, problem or symptom) and which experiences the opposite of that?”***

After two minutes ask the subject, ***“How real, strong or vivid does the feeling in your hands seem to be on a scale of 100% (completely real) to 0% (not real)?”*** (Therapist records whatever “Reality %” the subject reports experiencing.)

Recording “Reality %” is a way of focusing attention, heightening expectancy, and *activating the subject’s neural networks that encode the issues, problems, and motivations* for seeking a creative healing experience on all levels from mind to behavior and psychophysiology via *activity and experience-dependent gene expression and brain plasticity*.

#### 5. Negative Past Review Reality % 0%.....50%.....100%

Tell the subject, ***“Let the hand that experiences your issue (concern, problem or symptom) now begin to drift down very slowly . . .all by itself . . . as your inner mind privately reviews the history, memories, and feelings of your issue (concern, problem or symptom) from the beginning to the present moment.”***

Therapists model for the subject by very slowly lowering one hand as illustrated in figure 1b. If the subject begins to show negative cathartic reactions (frowning, weeping, etc.) the therapist can offer emotional support with empathetic *implicit processing heuristics* (positive permissive suggestions, Rossi, 2002, 2004; Rossi & Rossi, 2007) such as these.



**Figure 1b: Stage 2 of the four-stage creative process in the activity-dependent mirroring hand process of *The Creative Psychosocial Genomic Healing Experience* (Rossi, 2002, 2004, 2007).**

***“That’s right! Do you have the courage . . . to allow that hand and arm to drift down a bit. . . with each memory you find yourself reviewing?”***

***“Allowing your inner mind to feel only as much of that as you need to . . . and then move on to the next memory that comes up more or less by itself.”***

***“That’s right . . . let yourself have the courage to continue . . . only as long as you need to . . . to experience everything as fully as you need to . . . privately.”***

***“That’s right . . . while another part of you observes wisely . . . as you learn how to take care of yourself . . . and expect the best possible outcome.”***

This therapeutic review is “fail-safe” in the sense that the only so-called, “failure” is that some people do not understand how to become engaged with their issues in a meaningful way. The easiest way of helping people understand how to have a therapeutic experience is to provide them with opportunities to observe others become optimally engaged in *The Creative Psychosocial Genomic Experience*. Such observations in group therapy, for example, provide

the subject's mirror neurons with appropriate psychosocial experiences, which they learn to use as models for their own therapeutic experiences.

This therapeutic review is "safe" in the sense that patients do not undergo a so-called, "re-traumatization of themselves" in this review of negative past experiences because they are experienced in a safe context (Foa, 2008). The safe context is that the *negative memories and emotions are carefully circumscribed and limited when they are externalized by being projected into one hand only*. The negative memories are always *balanced by experiencing their complementary opposite on the other hand* (presumably positive inner resources activated in step #4 above: Experiencing a Problem and its *Opposite*).

When the problem hand finally touches down in the subject's lap, the therapist asks, **"How real, strong, and vivid do your memories and feelings seem to be on a scale of 100% (completely real) to 0% (not real)?"** (*Therapist records whatever "Reality %" the subject reports experiencing.*)

*The therapist now facilitates the transition to stage three of the creative process with: "Wonderful . . . appreciating a job well done . . .and now getting ready to move on to the resolution of this issue (concern, problem or symptom).*

### **Stage 3: Illumination, Facilitating Creative Mind-Genes Replays**

This the famous "Aha" or "Eureka" experience of insight celebrated in ancient and modern literature as well as current neuroscience (Ehrenberg, 2010) is illustrated in figure 1c. Creative insight, problem solving & healing often seem to happen spontaneously. Subjects are usually surprised and delighted when they receive a creative thought. Many people automatically dismiss their own originality as worthless since it has never been reinforced in their early life experience. *The therapist's main job at this stage is to help the subject recognize and appreciate the value of the "new" and creative that usually emerges spontaneously and unheralded.* Often the subject may have already thought of the options that come up for problem solving at this stage but dismissed them since they were never validated. Here we strongly support them!



**Figure 1c: Stage 3 of the four-stage creative process in the activity-dependent mirroring hand process of *The Creative Psychosocial Genomic Healing Experience* (Rossi, 2002, 2004, 2007).**

**6. Positive Now & Future Reality % 0% . . . . . 50% . . . . . 100%**

The following implicit processing heuristics prompt people experience the Novelty-Numinosum-Neurogenesis Effect: The *novelty* of this *Creative Psychosocial Genomic Healing Experience* tends to turn on the *numinosum* (a highly motivated state of focused attention, expectancy, wonderment, and fascination), which evokes activity and experience-dependent gene expression and brain plasticity (Atkinson et al., 2010; Rossi, 2002, 2004, 2007; Rossi et al., 2008). The therapist continues to model the subject's behavior by slowly lowering the other hand as illustrated in figure 1c with these words.

***"Now allow your other hand to drift down slowly as you explore new possibilities about how to solve your problem today . . . Will that hand now begin go down slowly as you begin to experience something new? . . . Explore all your hopes . . . the most interesting and wonderful possibilities of healing and well being . . . Speculate about exciting and fascinating turning points in your life . . . Create the best of all possible worlds for yourself . . . Enjoy your best dreams about yourself!"***

This fragile and tenuous transition from the difficulties of the previous stage two reviews of past problems to the new joyous possibilities of stage three that now emerge can often be read in the delicate shifts of the subject's facial expressions. Notice carefully the shifts from negativity, stress, sadness, and conflict (of stage two) to the more searching expressions of expectation in stage three that are often punctuated with a slight smile and even a short laugh. Sometimes subject's will manifest other minimal behavioral cues of their positive attitude and enjoyment of this third stage of their creative experience by spontaneous head nodding "yes" and shaking, rocking, or caressing themselves comfortably. The therapist now supports these positive shifts with a few warm implicit processing heuristics such as these.

***"Something pleasantly surprising you can look forward to? . . . What you really need that is most interesting and important to you?"***

***"Simply receiving and continuing to explore the sources of your strength for dealing successfully with that issue."***

***"Yes, appreciating the value of that as fully as you need to while taking good care of yourself as that hand finally comes to rest in your lap."***

When the hand finally touches down in the subject's lap, the therapist asks, ***"How real, strong, and vivid do these new positive possibilities and feelings for changing your life seem to be on a scale of 100% (completely real) to 0% (not real)?"*** (Therapist records whatever "Reality %" the subject reports experiencing.)

The therapist now facilitates the transition from stage three of the creative process to stage four with: ***"Wonderful . . . really appreciating yourself for a job well done! . . . And now getting ready to move on to the resolution of this issue (concern, problem or symptom)!"***

#### **Stage Four: Integration and Reality Testing:**

The therapist optimizes stage four illustrated in figure 1d by (1) facilitating a follow-up discussion to validate the value of the subject's experiences and (2) helping the subject reframe symptoms into signals and psychological problems

into inner resources. Here is a four part implicit processing heuristic to mediate these creative transitions (Rossi, 2002, Chapter Nine).



**Figure 1d: Stage 4 of the four-stage creative process in the activity-dependent mirroring hand process of *The Creative Psychosocial Genomic Healing Experience* (Rossi, 2002, 2004, 2007).**

***“When . . . [pause]***

- 1. A part of you knows it can continue this creative work entirely on its own at appropriate times throughout the day . . . [pause]***
- 2. And when your conscious mind knows it can simply cooperate in helping you recognize when it is the right time to tune in . . . [Pause]***

***Will that give you a feeling, a signal that it’s time for you to stretch, open your eyes and come fully alert so you can discuss how you can use this in your real everyday life?”***

Mentioning “*appropriate times throughout the day*” and “*the right time to tune in*” are ultradian cues that help people utilize their entirely natural Basic Rest Activity Cycle that takes place every 90-120 minutes throughout the 24 hour day.

Such implicit processing heuristics help people access the state dependent encoding of behavior state related gene expression, brain plasticity, and mind-body healing that can take place most easily at “appropriate times” of their circadian cycle. The therapist can further facilitate with these implicit processing memes that can optimize the evolutionary, adaptive, and constructive aspects of future mind (Rossi, Erickson-Klein, Rossi, 2008).

***“Something interesting you would like to share about that?”***

***“What is surprising and unexpected about this that is new to you?”***

***“What is most significant and life changing about this for you?”***

***“How will you remind yourself to do this several times a day?”***

***“What does this lead you to now?”***

***“How will this change your life?”***

***“What will you do in your life that is different now?”***

The stress and symptom scaling of the subject’s state before and after the *Creative Psychosocial Genomic Healing Experience* is a measure of therapeutic progress, problem solving, and healing that is used to validate the value of the therapeutic process

**Repeats If Necessary:** If stress and symptom reduction of less than 50% is reported, facilitate further therapeutic progress with, ***“If your inner nature knows it can do another unit of creative work right now so you can reach a more satisfactory state, will those eyes close for a few moments so you can fully receive everything you need at this time?”***

If stress and symptom reduction of less than 50% continues after two or three repeats reassure the subject, ***“You know that your mind and body go through a natural cycle of ultradian healing and problem solving every couple of hours throughout the day and at night even when you are asleep & dreaming. Notice how your progress will continue all by itself and how you can improve your self-care every day.***

**Final Stress & Symptom (0% is Best)\_\_\_\_\_.**    **Confidence (100% is Best) \_\_\_\_\_.**

**7. Positive Self-Change 0% . . 100% 8. Positive Self-Prescription 0%..100%**

This corresponds to stage four of the creative experience wherein the subject has an opportunity to assess the value of the insights gained in their stage three “Aha” and plan how they will reality test them now and in the future. **Self Change 0% . . .100%** is the degree that the subject recognizes and accepts how they will **change their own thinking emotions, and behavior.**

**Self-Prescription 0% . . .100%** is the “reality %” which each subject believes they can give themselves **positive and satisfactory Self-Prescriptions for changing themselves.**

**Subjective Time Est. Min: 0-5 6-10 11-20 21-30 31-40 41-50 51- 60+**

Immediately after the experience (following stage four when the subject usually opens their eyes, although they are usually not asked to close them in the first place), the subject is asked (without looking at their watch) to estimate how much time passed since the beginning of their experience. This is their Subjective Time Estimate in Minutes.

**Real Time (Min.): 0-5 6-10 11-15 16-20 21-25 26-30 31-40 41-50 51-60+**

This is the real time of the subject was involved in the creative experience that the therapist records here,

**9. Mental Absorption: (Real Time / Est. Time) X 100 = \_\_\_\_\_ %**

Now the therapist can calculate the subject’s degree of mental absorption or engagement via so-called “time distortion,” which research has recently noted as being a reliable indicator of positive engagement and expectancy, which are characteristic of creative and therapeutic states of mind (Naish, 2007).

For example, a person might be engaged in *The Creative Psychosocial Genomic Healing Experience* for 20 minutes in “real time” as measured by the therapist’s stop-watch. When asked by the therapist immediately after this experience (typically when the person opens their eyes, stretches, adjusts themselves, etc.), “How long would you estimate you were you doing that inner

work (trance, hypnosis, meditation, etc.)?” however, the person might guess, “about 5 minutes.” Doing the calculation: 20 minutes/ 5 minutes X 100 = 400% mental absorption or engagement. “400% mental absorption” may sound a bit peculiar initially but it is an indication that people are more focused and active mentally during this ideo-plastic protocol for their *The Creative Psychosocial Genomic Healing Experience*. We interpret this to mean that people can become so deeply engaged (absorbed) in their inner work that they “forget time” and underestimated how long they were creatively engaged. This is very typical of people when they are engaged in creative, important, and highly motivating activities, which we propose, actually turns on “*activity-dependent gene expression and brain plasticity*” for healing and problem solving at the molecular-genomic and neural level.

**10. % Stress Reduction: Initial Stress / Final Stress X 100 = \_\_\_\_\_%**

The therapist now asks the subject how much stress (or symptoms) the subject is now experiencing in comparison with the subject’s initial stress score recorded in the beginning before *The Creative Psychosocial Genomic Healing Experience* began. The therapist now calculates the % **Stress Reduction** as indicated.

For example, a person might estimate that their *initial stress* level is at the 90% level. At the end of *The Creative Psychosocial Genomic Healing Experience* he/she might estimate stress has been reduced to the 10% level. Doing the math: 90% / 10% = 0.90 / 0.10 = 9 X 100 = 90% stress reduction.

**11. Surprise: 0%. . . .100%**

The therapist asks the subject to estimate on a scale of 0% to 100% how surprised they were by any aspect of their therapeutic experience. Neuroscience has established how experiences of surprise, novelty, and creative experience turn on Activity and Experience-Dependent Gene Expression and Brain Plasticity, which is the molecular-genomic basis of *The Creative Psychosocial Genomic Healing Experience*, psychotherapy, and rehabilitation that we seek to assess and facilitate with this scale.

**12. Confidence: 0 % . . . 100%**

The therapist asks the subject to estimate on a scale of 0% to 100% how confident they are of the value of their therapeutic experience in resolving the problems, symptoms, or issue they worked with.

**Education: Elementary High School College Masters Doctorate**

**Age: 0 – 9 10 – 19 21 – 29 30 – 39 40 – 49 50 – 59 60 – 69 70 – 79 +**

**Sex: M F**

**Night Sleep Length: 1h 2h 3h 4h 5h 6h 7h 8h 9h 10h 11h 12h +**

**Dreams: 1 2 3 4 5 6 7 Days/Week. Est. Dreams Per Night\_\_\_\_\_**

**Comments:**

Comments by the subject indicating any happy, surprising or unexpected, positive aspects of the experience are recorded by the therapist. These spontaneous manifestations of the creative healing experienced, particularly during stage three and four, are worthy of further reinforcing by remarks by the therapist.

**AN OPEN INVITATION TO RESEARCH:****THE CREATIVE PSYCHOSOCIAL GENOMIC HEALING EXPERIENCE****Facilitating Creative Consciousness: The Rational for Exploring the “Opposites” in the Creative Psychosocial Genomic Healing Experience**

Experiencing the opposites for the creation of new consciousness, identity, healing, and conflict resolution via the *Creative Psychosocial Genomic Healing Experience* has a profound but little known history ranging from the ancient origins of eastern and western philosophy to modern neuroscience and computer technology. Here we briefly review a few highlights for understanding this deep rational for our *Creative Psychosocial Genomic Healing Experience*.

The earliest record of the role of the opposites in the creation of new consciousness goes back to the Chinese philosopher, Lao Tzu (Zi), the author of the *Tao Te Ching* in the 7<sup>th</sup> century BC (Wilhelm, 1990).

“Occasionally Lao Zi puts forward a curious deduction of his own from the *Book of Changes*, as when he says that the One creates the Two, the Two creates the Three and the Three creates all things. In this way he sets forth and develops the complementarity of *opposites*. . . Similar ideas can even be found in more recent philosophy: Hegel’s dialectic, with its thesis, antithesis and synthesis, where synthesis then becomes the thesis for the next series, the departure point for all that follows – is based on an approach very much like Lao Zi’s. The two primal powers from which the visible world as the Third is born, are Heaven and Earth, *yang* (the light power) and *yin* (the dark power), the positive and negative line, the temporal and the spatial – in other words the *opposites* from which the phenomenal world proceeds.” (pp. 73-74)

Examples of the most recent evolution of the central role of the opposites are illustrated by Melanie Mitchell (2009) in her recent book on *Complexity*, wherein she describes how she wrote a computer program to model the function of the opposites in the emergence of new analogies, metaphors, consciousness and meaning.

“The cognitive scientist Douglas Hofstadter, in his book *Gödel, Escher, Bach*, makes an extended analogy between ant colonies and brains, both being complex systems in which relatively simple components with only limited communication among themselves collectively give rise to complicated and system-wide (“global”) behavior. In the brain, the simple components are called *neurons*. The brain is made up of many different types of cells in addition to neurons, but most brain scientists believe that the actions of neurons and the patterns of connections among groups of neurons are what cause perception, thought, feelings, consciousness, and the other important large-scale brain activities. . . . No one knows exactly how any community of social organisms – ants, termites, humans – come together to collectively build the elaborate structures that increase the survival probability of the community as a whole.

Similarly mysterious is how the intricate machinery of the immune system fights disease: how a group of cells organizes itself to be an eye or a brain: how independent members of an economy, each working chiefly for its own gain, produce complex but structured global markets; or, most mysteriously, how the phenomena we call “intelligence” and “consciousness” emerge from non-intelligent, non-conscious material substrates. Pp.4-6.

Mitchell goes on to describe how previous generations of biologists assumed that during natural evolution our genes were accidentally slapped together in a kind of “molecular Rube Goldberg machine.” She presents “a countering thesis: most of the beautiful order seen in ontogeny is a spontaneous, natural expression of the stunning self-organization that abounds in very complex regulatory networks. . . Order, vast and generative, arises naturally.” Stuart Kauffman (1993) has proposed how such complex *gene regulatory networks* have an innate tendency to become more complex ultimately giving rise to the cognitive-behavioral levels of human experience that we describe as art, beauty, and truth. The link between these gene regulatory networks and cognitive-behavioral levels of consciousness is now thought to be mediated by the ribonucleic world of microRNA’s. Current epigenetic research, for example, documents how *FOXP2*, a gene implicated in human speech, also plays a significant role in bird-song learning (Balter, 2010). Clayton, one of the scientists involved in this research, believes “this is the first time a microRNA has been shown to respond to a particular thought process” (Saey, 2010; Kim et al., 2010; Warren, Clayton, et al., 2010). This leads us to propose how future research on the *Creative Psychosocial Genomic Healing Experience* may document how the 4-stage creative process could access and facilitate the microRNA gene regulatory network underpinning stress, health, and well-being (Atkinson et al., 2020; Rossi, 2002, 2004, 2007; Rossi, Vyas et al., 2010).

Since our initial pilot study (Atkinson et al., 2010; Rossi, Iannotti et al. 2008; Rossi, Vyas et al., 2010) had only three subjects it is important to replicate it with larger populations (~ 30 subjects) and many diagnostic categories. Our

initial cohort of three highly susceptible hypnotic subjects all had advanced academic degrees and were recruited from a university environment by the second co-author (Iannotti) on the basis of a General Psychiatric Evaluation, The Minnesota Multiphasic Personality Inventory (MMPI-2), The Tellegen Absorption Scale (highly correlated with Standard Scales of Hypnotic Susceptibility), and the Spiritual Intelligence Self Report Inventory (high scorers on the SISRI-24 acknowledge heightened experiences related to Critical Existential Thinking, Personal Meaning Production, Transcendental Awareness, and Conscious State Expansion). These subjects scored within the normal range of personality characteristics with no evident psychopathology on the MMPI-2. They were all enthusiastic volunteers who responded well to the *“Creative Psychosocial Genomic Healing Experience”* with a positive sense of focused attention, expectancy, appreciation, wonder, and therapeutic well being.

A full description of the clinical intervention, sample collection, and microarray analysis can be found in Rossi, Iannotti et al. 2008. Briefly, peripheral blood was obtained from three adult subjects immediately prior to, 1 hour after, and 24 hours after a single session of therapeutic hypnosis according to the protocol *“Creative Psychosocial Genomic Healing Experience”* established by Rossi (2004). Total RNA was extracted from leukocytes, quantified, and purified. Approximately 2.5 µg of purified total RNA was delivered to the MicroCRIBI Service (University of Padova, Italy) for microarray analysis. MicroCRIBI Service performed the microarray analysis on 21,329 - 70mer oligonucleotides (Operon version 2.0) designed on Human Unigene clusters. For each sample, 1.0 µg of total RNA was reverse transcribed and labeled with Cy3 and Cy5 fluorophores for two-channel scanning. Fluorophore labeling of “control” (Immediately before hypnosis) versus “treated” (1 hour or 24 hours after hypnosis) samples was counterbalanced, to control for dye bias. The microarrays were scanned with a two channel confocal microarray scanner (ScanArray# Lite, Perkin Elmer, USA) using its dedicated software (ScanArray Express 3.0.0., Perkin Elmer).

Table one notes some similarities and differences in the *Stanford Hypnotic Susceptibility Scales (SHSS)* (Hilgard, 1965, Table 96, p. 402), which emphasize pathological *dissociation*, and this initial beta version of the *Creative Psychosocial Genomic Healing Experience (CPGHE)*, which focuses on the *ideo-plastic* processes of activity-dependent gene expression and brain plasticity.

## **CLASSIC HYPNOSIS (SSHS) Vs PSYCHOSOCIAL GENOMICS**

<b>CLASSICAL HYPNOSIS</b>	<b>PSYCHOSOCIAL GENOMICS</b>
• <b>AGNOSIA (NOT KNOWING)</b>	• <b>4-STAGE CREATIVITY</b>
• <b>AMNESIA</b>	• <b>ENHANCED MEMORY</b>
• <b>TIME DISTORTION</b>	• <b>TIME CONDENSATION</b>
• <b>{+} HALLUCINATIONS</b>	• <b>IDEO-SENSORY SIGNALING</b>
• <b>{-} HALLUCINATIONS</b>	• <b>IDEO-MOTOR SIGNALING</b>
• <b>DREAMS &amp; REGRESSION</b>	• <b>DREAM &amp; CONSCIOUSNESS</b>
• <b>LOSS OF SELF CONTROL</b>	• <b>SELF-EMPOWERMENT</b>
• <b>POSTHYPNOTIC compulsion</b>	• <b>SELF-PRESCRIPTIONS</b>

**Table One: A comparison of the Classical Stanford Scale of Hypnotic Susceptibility (SSHS) with the ideo-plastic Creative Psychosocial Genomic Healing Experience (CPGHE).**

Table one highlights the differences between the *SSHS* and the *CPGHE* to draw attention to a series of hypotheses that motivate the type of epigenetic creative psychosocial genomic research that is now required. The classical measures of hypnosis like the *Stanford Scale of Hypnotic Susceptibility (SSHS)* and related scales were based on the classical population genetics of Fischer, Haldane, and Wright, which provided a mathematical description of the dynamics of Mendelian inheritance and natural selection over the generations (Mitchell, 2009). This is in sharp contrast with the dynamics of epigenetics, functional genomics, and modern complexity theory (Mitchell, 2009), which provides the research base for understanding how mind-body therapy is possible within an individual in real time here and now via the ideo-plastic dynamics of gene expression assessed by the *Creative Psychosocial Genomic Healing Experience (CPGHE)*. The theory and applications of the *SSHS* and the *CPGHE* each have

a appropriate function in psychotherapeutic practice but they are different as highlighted here.

- The classical hypnosis scales (*SHSS*) were constructed so that only 5-7% of the general population is scored as “highly susceptible.” This implies that only 5-7% of the general population would be suitable for therapeutic hypnosis. We hypothesize, however, that with appropriate psychosocial experience and training everyone will be able to score highly on the CPGHE. Therefore it will be well suited for facilitating translational research and the clinical practice of therapeutic hypnosis, psychotherapy, meditation, and counseling with everyone.
- Research on the effects of training people to optimize their score on the classical scales of hypnotic susceptibility has been discouraging. Since people are not able to improve their classical hypnotic susceptibility, *SHSS* scores are conceptualized as a “fixed trait” that is investigated with the paradigms of classical population genetics (e.g. Lichtenberg et al., 2002, 2004; Szekely et al., 2010). This would imply that most subjects cannot improve their self-care and psychotherapeutic skills as measured by the *SHSS*.
- This is the opposite of what neuroscience and psychological research demonstrates about humans – we are very responsive to psychosocial learning opportunities for improving our psychotherapeutic skills and well being! Crowds and social activity actually turns on experience-dependent gene expression (Ganguly-Fitzgerald et al. 2006). This means that the CPGHE is a measure of *epigenetics* (Atkinson et al., 2010) assessing the natural moment-to-moment effects of evocative, on-going cognitive-behavioral and psychosocial experiences on activity or experience-dependent gene expression is in sharp contrast with the *SHSS*, which assesses hypnosis as “fixed trait” of *classical population genetics*. Experience with the CPGHE suggests that most people can improve their performance when (a) they are given appropriate, positive instruction and illustrations about how the 4-stage creative process is typically

experienced; (b) they are given optimal opportunities to actually experience the CPGHE and openly share their experiences in supportive groups; (c) when their privacy is respected during self-motivated sharing of their positive creative experience. We hypothesize that creative therapeutic achievement on the CPGHE is enhanced by psychosocial learning in positive, constructive, and non-competitive groups.

- We hypothesize that the CPGHE is a means by which people can empower themselves by learning how to experience the 4-stage creative process in everyday life as well as in academic, artistic, scientific, and therapeutic situations on all levels from mind to gene.
- We hypothesize that scores and response profiles on the CPGHE will be associated with unique profiles of activity and experience-dependent gene expression (measured with DNA and Micro RNAs microarrays) and brain plasticity (measured with fMRI). The *Gene Set Enrichment Analysis (GSEA)* computer program available free on the internet from MIT can be used to assess the meaning of DNA microarray findings for practical therapeutic purposes.
- The characteristics of classical hypnosis as measured by the *SHSS* in table one are associated with undesirable states of extreme *dissociation* such as agnosia (not knowing), and pathology (amnesia, hallucinations, regression, loss of self control), which are typical of psychological dysfunctions. We hypothesize that the characteristics of the CPGHE, by contrast, are associated with the positive, creative *ideo-plastic* processes of psychological resilience, resourcefulness, self-empowerment and mind-body healing (Atkinson et al., 2010; Rossi, Vyas, et al. 2010; Rossi et al., 2011, in press; Wetterstrand, 1902). This may be the reason why research and professional commentators over the past two generations have cast doubt on the value and validity of “hypnotherapy” practiced as a method of putting people into a “sleep-like trance” and programming them with post-hypnotic suggestions and

commands while they are misperceived to be vulnerable and robot-like in their behavior.

- The historical misconceptions of classical hypnosis as a negative and possibly harmful process of “power, programming, manipulation, and control of human cognition and behavior” has led to the unfortunate reality that today classical hypnotic scales (*SHSS*) are no longer easily available, perhaps because of fears of liability with their misuse. We hypothesize that the positive and creative activity-dependent ideo-plastic” experiences facilitated by the *CPGHE* are consistent with what neuroscientists call “activity-dependent gene expression and brain plasticity.” We propose that this creative ideo-plastic faculty will have greater face validity as a definition of modern mind-body healing, rehabilitation, and therapeutic hypnosis that will be welcomed by the general public.

Considerable research will be required to assess the validity and reliability the administration of the *CPGHE* with the typical statistical methods of standardizing any psychological scale with item analysis, factor analysis, etc. We need to explore, for example, the art of questioning subjects about their experience in a manner that will not distract them from the creative flow of their inner processing. Variations in the language of the *CPGHE* for individual and group administration need to be assessed. Details about optimizing this creative approach to facilitating activity and experience-dependent gene expression and brain plasticity are presented in chapter nine of “*A Discourse with Our Genes: The Psychosocial and Cultural Genomics of Therapeutic Hypnosis and Psychotherapy*” (Chapter nine, Rossi, 2004). More extended theoretical and practical presentations of our new psychosocial genomic concept of psychotherapy from mind to gene may be found in Rossi (2002, 2004, 2007; Rossi, Vyas, et al., 2010).

**SELF-ORGANIZING MIND-GENE MAPS OF  
THE CREATIVE PSYCHOSOCIAL GENOMIC HEALING EXPERIENCE**

We expect that the subjective experiences that are assessed by *The Creative Psychosocial Genomic Healing Experience* will contribute valuable insights when they are entered into the subject's experience-dependent gene expression matrix (the data from the DNA microarray gene chips) for the construction of Heat Maps and Self-Organizing Mind-Gene Maps, which will provide a picture of mind-body relationships via the epigenetics of genomic regulatory networks (Geschwind & Konopka, 2009; Petronis, 2010; Mitchell, 2009)

Note that the 12 points scored on this scale together with the subjects scores on the *Tellegen Absorption Scale*, *The Stanford and Harvard Group Scale of Hypnotic Susceptibility*, *The Minnesota Multiphasic Personality Inventory 2 (MMPI 2)*, *The Spiritual Intelligence Self Report Inventory (SISRI)* <http://www.dbking.net/spiritualintelligence/sisri.htm> - and any other variables researchers would like to study – can be transformed into standard scores and entered into the same data matrix with the subject's gene expression data. The matrix of gene expression scores and psychological scores could be used to make Heat Maps and Self-Organizing Genomic/Psychological Maps. Visualized Mind-Gene Maps could give us more understanding of the evolving theory, research, and practice of psychosocial genomics (Dusek et al. 2008; Eisen et al., 1998; Jiang, et al. 2004; Kim, 2008; Kustra et al., 2006; Mahony, et al., 2004; Rossi et al. 2008).

The Use of DNA Microarrays (Rossi, 2005/2006) and bioinformatics software programs such as GSEA (<http://www.broadinstitute.org/gsea/>) and DAVID (<http://david.abcc.ncifcrf.gov/>) for the annotation, meaning, and therapeutic implications of *The Creative Psychosocial Genomic Healing Experience* are now being investigated. Such research already suggests that it reduces (1) chronic dysfunctional inflammation (associated with chronic pain and delayed healing); (2) oxidative stress (associated with many chronic medical and psychological conditions as well as the ageing process); (3) increases a

“molecular signature of stem cells” (possibly associated with activating stem cells throughout the body). We hypothesize that these three deep molecular-genomic processes, plus others to be determined by further research, could eventually define what we call, “*The Creative Psychosocial Genomic Healing Response.*”

Such research could determine if this is also the molecular-genomic signature of the healing placebo (Benedetti, 2008). This is consistent with research that documents how interventions via therapeutic hypnosis (the Ultradian Healing Response) and meditation (the Relaxation Response) reduces stress and promotes healing on the molecular-genomic level (Dusek et al., 2008; Rossi, 2002, 2004, 2007; Rossi, Iannotti et al., 2008; Yehuda et al., 2009). Future research could examine these therapeutic effects directly using novel markers of inflammation and oxidative stress such as 5'-ectonucleotidase (NT) in humans as described by Blake-Mortimer et al (1996, 1998, 2000). We invite other research groups to coordinate with us in the standardization and further documentation of the therapeutic value of *The Creative Psychosocial Genomic Healing Experience* on all levels from the cognitive-behavioral to the molecular-genomic.

<http://www.ernestrossi.com/ernestrossi/Neuroscienceresearchgroup.html>.

**THE CREATIVE PSYCHOSOCIAL GENOMIC HEALING EXPERIENCE**  
**(Scoring & Assessment Form)**

**Initial Time** \_\_\_\_\_ am pm

**Initial Stress: 0% . . . 100%**

**Accessing Resources:**

1. Warmer – Cooler 0% . . . 100%

2. Stronger – Weaker 0% . . . 100%

**Engaging Issues:**

3. Child – Adult 0% . . . 100%

4. Problem – Opposite 0% . . . 100%

**Creative Replays:**

5. Negative Past Review 0% . . . 100

6. Positive Now & Future 0% . . . 100%

**Integration:**

7. Positive Self Change 0% . . . 100%

8. Positive Self-Prescription 0% . . . 100%

**Real Time (Min.):** 0-5 6-10 11-15 16-20 21-25 26-30 31-40 41-50 51-60 61+

**Est. Time (Min.):** 0-5 6-10 11-15 16-20 21-25 26-30 31-40 41-50 51-60 61+

**9. Mental Engagement:** Real Time / Est. Time X 100 = \_\_\_\_\_ %

**10. Stress Reduction:** Initial Stress / Final Stress X 100 = \_\_\_\_\_ %

**11. Surprise:** 0% . . . 100%

**12. Confidence:** 0% . . . 100%

**Education:** Elementary High School College Masters Doctorate

**Age:** 0 – 9 10 – 19 21 – 29 30 – 39 40 – 49 50 – 59 60 – 69 70 – 79 +

**Sex:** M F

**Night Sleep Length:** 1h 2h 3h 4h 5h 6h 7h 8h 9h 10h 11h 12h +

**Dreams:** 1 2 3 4 5 6 7 **Days/Week.** **Est. Dreams Per Night** \_\_\_\_\_

**Comments**

## REFERENCES

- Akil, H., Brenner, S., Kandel, E., Kendler, K., King, M., Scolnick, E., Watson, J., Zoghbi, H. (2010). The future of psychiatric research: Genomes and Neural Circuits. *Science*, 327, 1580-1581.
- Atkinson, D., Iannotti, S., Cozzolino, M., Castiglione, S., Cicatelli, A., Vyas, B., Mortimer, J., Hill, R., Chovanec, E., Chiamberlando, A., Cuadros, J., Virot, C., Kerouac, M., Kallfass, T., Krippner, S., Frederick, C., Gregory, B., Shaffran, M., Bullock, M., Soleimany, E., Rossi, A., Rossi, K., Rossi, E., (2010). A new bioinformatics paradigm for the theory, research, and practice of therapeutic hypnosis. *American Journal of Clinical Hypnosis*, 53 (1). Reprinted in: Rossi, E., Erickson-Klein, R., & Rossi, K. (2011). *The Collected Works of Milton H. Erickson, M.D.* Vol. 7: Chapter 30: *A new bioinformatics paradigm for the theory, research, and practice of therapeutic hypnosis.*
- Atkinson, D., Salvatore Iannotti, Mauro Cozzolino, Stefano Castiglione, Angela Cicatelli, Kathryn Rossi, and Ernest Rossi, (2010, In Submission). A bioinformatic analysis of the molecular-genomic signature of therapeutic hypnosis. *Psychiatric Research*.
- Balter, M. (2010). Animal communication helps reveal roots of language. *Science*, 328, 969-971.
- Benedetti, F. (2008). *Placebo Effects: Understanding the mechanisms in health and disease*. New York: Oxford University Press.
- Blake-Mortimer, J., Winefield, A., & Chalmers, A. (1996). The relationship between psychological stress and lymphocytic 5'-ectonucleotidase during stress. *International Journal of Stress Management*, 3, 189-207.
- Blake-Mortimer, J., Winefield, A., & Chalmers, A. (1998). Evidence for free radical mediated reduction of lymphocytic 5'-ectonucleotidase during stress. *International Journal of Stress Management*, 5, 57-75.
- Chalmers, A., Blake-Mortimer, J., & Winefield, A. (2000). Lymphocytic 5' ectonucleotidase, an indicator of oxidative stress in humans. *Redox Report*, 5, 89-91.

- Dusek J., Hasan H., Wohlhueter A., Bhasin M., Zerbini L., Joseph M., Benson H., Libermann T. (2008). Genomic Counter-Stress Changes Induced by the Relaxation Response. (2008). *PLoS ONE*, 3(7): e2576. doi:10.1371/journal.pone. 0002576.
- Ehrenberg, R. (2010). Eureka! Brain makes leaps. *Science News*, 177(12), 9.
- Eisen, M., Spellman, P., Brown, P. & Botstein, D. (1998). Cluster analysis and display of genome-wide expression patterns. *Proceedings of the National Academy of Science*, 95, 14863-14868.
- Foa, E., Cohen, J., Keane, T., Friedman, M. (2008). *Effective Treatments for PTSD: Practice Guidelines from the International Society for Traumatic Stress Studies*. N.Y.: Guilford.
- Ganguly-Fitzgerald, I., Donlea, J., Shaw, P. (2006). Waking Experience Affects Sleep Need in *Drosophila*. *Science*, 313, 1775-1781.
- Geschwind, D. & Konopka, G. (2009). Neuroscience in the era of functional genomics and systems biology. *Nature*, 461, 908-915.
- Hilgard, E. (1965). *Hypnotic Susceptibility*. N.Y.: Harcourt, Brace & World.
- Insel, T. (2009). Disruptive insights in psychiatry: Transforming a clinical discipline. *Journal of Clinical Investigation*, 119 (4), 700-705.
- Insel, T. (2010). Faulty circuits. *Scientific American*, 302 (4), 44-51.
- Jiang, D. Chun Tang, C., & Zhang, A. (2004). Cluster analysis for gene expression data: a survey. *Knowledge and Data Engineering, IEEE Transactions*, 16(11), 1370-1386.
- Jung, C. (1923). *Psychological Types*. N.Y.: Pantheon.
- Jung, C. (1963). *Mysterium Coniunctionis: An Inquiry into the Separation and Synthesis of Psychic Opposites in Alchemy*. N.Y: Pantheon.
- Kauffman, S. (1993). *The origins of order*. N.Y.: Oxford University Press.
- Kim, C. (2008). Self-Organizing Maps with Statistical Phase Synchronization (SOMPS) for Analyzing Cell Cycle-Specific Gene Expression Data. *Statistical Applications in Genetics and Molecular Biology: Vol. 7 : Iss. 1*, Article 1. <http://www.bepress.com/sagmb/vol7/iss1/art1>.

- Kim, T., Hemberg, M. et al. (2010). Widespread transcription at neuronal activity-regulated enhancers. *Nature*, 465, 182-187.
- Kustra, R., Shioda, R. and Zhu. M. (2006). A factor analysis model for functional genomics. *BMC Bioinformatics*, 7:216 doi:10.1186/1471-2105-7-206.
- Lichtenberg, P., Bachner-Melman, R., Gritsenko, I., Ebstein, R. (2000). Exploratory association study between catechol-O-methyltransferase (COMT) high/low enzyme activity polymorphism and hypnotizability. *American J. Medical Genetics*, 96, 771-774.
- Lichtenberg, P., Bachner-Melman, R., Ebstein R., Crawford., H. (2004). Hypnotic susceptibility: multidimensional relationships with Cloninger's Tridimensional Personality Questionnaire, COMT polymorphisms, absorption, and attentional characteristics. *International Journal Clinical of Experimental Hypnosis*, 52, 47-72.
- Lloyd, D & Rossi, E (Eds.) (1992). *Ultradian Rhythms in Life Processes: An Inquiry into Fundamental Principles of Chronobiology and Psychobiology*. NY: Springer-Verlag.
- Lloyd, D & Rossi, E (Eds.) (2008, In Press). *Ultradian Rhythms From Molecules to Mind: A New Vision of Life*. NY: Springer.
- Luco, R., Pan, Q., Tominaga, K., Blencowe, B., Pereira-Smith, O., Misteli, T. (2010). Regulation of alternative splicing by histone modifications. *Science*, 327, 996-1000.
- Mahony, S., McInerney, J. , Smith, T., & Golden, A. (2004). Gene prediction using the Self-Organizing Map: automatic generation of multiple gene models. *BMC Bioinformatics*, 5:23doi:10.1186/1471-2105-5-23.
- Mitchell, M. (2009). *Complexity: A guided tour*. N.Y.: Oxford University Press.
- Naish, P. (2007). Time distortion, and the nature of hypnosis and consciousness. In Jamieson, G. (Ed.) *Hypnosis and Conscious States: The Cognitive Neuroscience Perspective*. Oxford: Oxford University Press.
- Nobrega, M. (2010). A human geneticist explores the ways that genes are regulated. *Nature*, 466, 11.

- Petronis, A. (2010). Epigenetics as a unifying principle in the aetiology of complex traits and diseases, *Nature*, 465, 721-727.
- Rossi, E (1972/1985/2000). *Dreams, Consciousness & Spirit: The Quantum Experience of Self-Reflection and Co-Creation*. (3<sup>rd</sup> Edition of *Dreams & the Growth of Personality*). NY: Zeig, Tucker, Theisen.
- Rossi, E. (2002). *The Psychobiology of Gene Expression: Neuroscience and Neurogenesis in Therapeutic Hypnosis and the Healing Arts*. NY: W. W. Norton Professional Books. ISBN: 0 – 393 – 70343 – 6.
- Rossi, E. (2004). (Translator & Editor, Salvador Iannotti: Saiannot@tin.it) *Discorso Tra Geni [Italian]. A Discourse with Our Genes: The Psychosocial and Cultural Genomics of Therapeutic Hypnosis and Psychotherapy*. Benevento, Italy: Editris SAS Press. [Available in Italian and English editions] ISBN 88 – 89396 – 01 – 6. NY: Zeig, Tucker, Theisen.
- Rossi, E. (2005/2006). Prospects for Exploring the Molecular-Genomic Foundations of Therapeutic Hypnosis with DNA Microarrays. *American Journal of Clinical Hypnosis*, 48 (2-3), 165-182.
- Rossi, E. (2007). *The Breakout Heuristic: The New Neuroscience of Mirror Neurons, Consciousness and Creativity in Human Relationships: Selected Papers of Ernest Lawrence Rossi*. Phoenix, Arizona: The Milton H. Erickson Foundation Press. [office@erickson-foundation.org](mailto:office@erickson-foundation.org).
- Rossi, E., Rossi, K., Yount, G., Cozzolino, M., and Iannotti, S. (2006). The Bioinformatics of Integrative Medical Insights: Proposals for an International PsychoSocial and Cultural Bioinformatics Project. *Integrative Medicine Insights*, 2006: 2 1–19. <http://www.ernestrossi.com/ernestrossi/Neuroscienceresearchgroup.html>
- Rossi, E & Rossi, K. (2006). The Neuroscience of Observing Consciousness & Mirror Neurons in Therapeutic Hypnosis. *American Journal of Clinical Hypnosis*. 48: 283-278.
- Rossi, E. & Rossi, K. (2007). What is a Suggestion? The Neuroscience of Implicit Processing Heuristics in Therapeutic Hypnosis and

- Psychotherapy. *The American Journal of Clinical Hypnosis*. 49:4, 267-281.
- Rossi, E., and Rossi, K. (2008). Open Questions on Mind, Genes, Consciousness, and Behavior: The Circadian and Ultradian Rhythms of Art, Beauty, and Truth in Creativity. In Lloyd & Rossi (Eds.) *Ultradian rhythms from molecule to mind: A new vision of life*. New York: Springer. 391-412.
- Rossi, E. & Rossi, K. (2010). *How we light and brighten the lamps of human consciousness*. **DVD**, MHE Foundation Press, Phoenix, Arizona.
- Rossi, E., Erickson-Klein, R., and Rossi, K. (2008). The Future Orientation of Constructive Memory: An Evolutionary Perspective on Therapeutic Hypnosis and Brief Psychotherapy. *American Journal of Clinical Hypnosis*, 50:4, 343-350.
- Rossi, E., Iannotti, S., Cozzolino, M., Castiglione, S., Cicatelli, A. & Rossi, K. (2008). A pilot study of positive expectations and focused attention via a new protocol for therapeutic hypnosis assessed with DNA microarrays: The creative psychosocial genomic healing experience. *Sleep and Hypnosis: An International Journal of Sleep, Dream, and Hypnosis*, 10:2, 39-44.
- Rossi, E. & Rossi, K. (2009). How the mind and the brain Co-Create each other: Mind-Brain-Gene Research on the foundations of Consciousness, Creativity, Imagination, and Psychotherapy. Chapter 7 in Bosnak, R. (Ed.) *Imagination and Medicine*, Spring Publications Books.
- Rossi, E., Vyas, B., Atkinson, D., Iannotti, S., Cozzolino, M., Castiglione, S., Cicatelli, A., Vyas, B., Mortimer, J., Hill, R., Chovanec, E., Chiamberlando, A., Cuadros, J., Viroc, C., Kerouac, M., Kallfass, T., Krippner, S., Frederick, C., Gregory, B., Shaffran, M., Bullock, M., Soleimany, E., Rossi, A., Rossi, K., Rossi, E., (2010). What Makes Us Human? A Neuroscience Prolegomenon for the Philosophy of Evolution and Consciousness. Chapter 4 in (Purohit, A.K. editor) *The Philosophy of Evolution*. Bikaner, India: Yash Publishing. ISBN: 818688235-9.

- Rossi, E. et al. (2011, In press). The Creative Psychosocial Genomics of Human Resilience and Resourcefulness. In Celinski & Gow (Eds.) *Human Resilience and Resourcefulness*.
- Saey, T. (2010). First songbird genome arrives. *Science News*, 177(9), 16.
- Szekely, A., Kovacs-Nagy, R., Banyai, É., Gosi-Greguss, A., Varaga, K., Halmai, Z., Zsolt, R., & Sasvari-Szekely, M. (2010). Association Between Hypnotizability and the Catechol-O-Methyltransferase (COMT) Polymorphism. *International Journal of Clinical and Experimental Hypnosis*, 58(3), 301-315
- Warren, W., Clayton, D., Ellegren, H. et al. (2010). The genome of a songbird, *Nature* 464, 757-762.
- Wetterstrand, O. (1902). Hypnotism and Its application to practical medicine, New York: Putnam. Quoted in Tinterow, M. (1970). *Foundations of hypnosis, From Mesmer to Freud*. Springfield, C. Thomas Publisher, pp. 513 – 543.
- Wilhelm, R. (1990). *Tao Te Ching: The Book of Meaning and Life*. London: Arkana.
- Yehuda, R., Cai, G., Golier, J., Sarapas, C., Galea, S., Ising, M., Rein, T., Schmeidler, J., Müller-Myhsok, B., Holsboer, F., and Buxbaum, J. (2009). Gene Expression Patterns Associated with Posttraumatic Stress Disorder Following Exposure to the World Trade Center Attacks. *Biological Psychiatry*. 66(7), 708-711.