

Simon Says Trauma Gone:

Cognitive Neurophysics and the Principles of Change

Part I

By Mark Evan Furman

It is quite difficult to go through a lifetime and not experience a significant traumatic event that could potentially change our thoughts, emotions, behaviors and personality to the point where we are no longer recognizable to those who knew us previously. These significant traumatic events can range anywhere from war time POW experiences, violent crimes, cult conversion, childhood abuse and near-fatal accidents to divorce, school bullies, bad school grades and bee stings. No matter what the source, these experiences leave us instantly changed. What is the structure of such an experience? What is the fundamental substrate that continues to embody such an experience, altering our thoughts, values, beliefs, emotions, behaviors and our personalities? What would you give to be able to eliminate the life-disrupting distress of such a trauma for yourself, your loved ones or your clients with the use of nothing more than a mere \$25 child's toy? In fact, to be able to do this successfully, you need nothing more than to understand some of the fundamental laws and principles of *Cognitive-Neurophysics*.

Information Disease

Conway and Siegelman (1978) were the first to address the issue of sudden personality change considering the full range of common human experiences mentioned above. They called the phenomenon "Snapping" in their book, *Snapping: America's Epidemic of Sudden Personality Change*. Conway and Siegelman accurately cited the common connecting element as "information disease".

FSU's Active Ingredient

A few years ago, I had the pleasure of attending a research study at Florida State University (FSU) regarding the effectiveness of some of the top brief therapies for the treatment of Posttraumatic Stress Disorder (PTSD). The study was conducted in Tallahassee during May of 1995 and nicknamed "The Active Ingredient." The purpose of the study was to determine two things; first, to rate the top brief therapies in the order of their effectiveness and second, to distill the common denominator or active ingredient, if there was one, that made each of these therapies so effective. The conference was conducted by principle investigator, Charles Figley.

The Four Top Brief Therapies in the World

The four top therapeutic methods investigated were NLP's famous visual/kinesthetic dissociation - "V/KD" (Bandler and Grinder, 1979), Eye Movement Desensitization and Reprocessing - "EMDR" (Shapiro, 1995), Thought Field Therapy - "TFT" (Callahan, 1985), and Traumatic Incident Reduction - "TIR" (Gerbode, 1989). While all of these four therapeutic methods were found to be effective at eliminating distress associated

with PTSD, TFT was found to be the most effective. V/KD and EMDR tied closely for second position and TIR came in last. The measurements used to determine this were mainly that of treatment time in minutes and a follow-up subjective units of disturbance (SUD) score, which indicates the intensity of distress that a client experiences on a scale from 0 to 10. After the study was over, numerous researchers vied for publication rights to spell out what they thought was the active ingredient. The best of all submitted interpretations came from Fred P. Gallo (1999).

What Are We Measuring?

As in all studies, the agreed upon measurements always have somewhat of a flexible, unpredictable component to them which can significantly contribute to an unsuspected result. One interesting example of this is the way in which the SUD score of a subject was ascertained. While some of the therapists participating in the study used a 0 to 10 scale, others unwittingly used a 1 to 10 scale during the therapeutic intervention. Those that used a 0 to 10 scale, inadvertently suggested to the subject that their treatment method would eliminate *all* the distress. Those that used the 1 to 10 scale, were immediately at a disadvantage, even if their therapeutic intervention was better, since a 1 to 10 scale presupposes that no matter how well the therapy does, *some* distress will always remain. This is called an *ordinal presupposition* and as we know from the study of NLP, presuppositions are very powerful.

The SUD score by itself is a very poor measure of the success of a therapeutic intervention. Unfortunately, the field of psychology and psychotherapeutic intervention has floundered for more than a century looking for a more appropriate measurement for therapeutic change without much luck. Why is SUD score such a poor measure of change? SUD score is really just a measure of subjective *intensity* of distress. There are many psychological disorders, such as traumas and phobias, that produce high SUD scores in the 9 and 10 range, while at the same time, being very susceptible to change by a brief therapy intervention. Conversely, there are many more stable disorders such as clinical depression and obsessive compulsion disorder that have a very low SUD score in the range of 3 to 4, and yet are very resistant to change. The important principle to learn from this is that *intensity does not equal stability*. It is the stability of the pattern or the attractor that determines the resistance to change (Furman, Oct., 1995).

How Do We Measure Change?

The other difficulty arising in a comparison study such as this, is that each therapist essentially determined for themselves when a therapy was complete. Of course, each of the participating therapists determined this from different measurement models. This brings us to the most serious of the paradoxical conundrums. Since the inception of the field of psychotherapeutic intervention, there has never been an industry-wide, accepted model for the accurate assessment of the degree of change sustained by a client after psychotherapeutic intervention. The serious consequences of such a lack of measurement is that a therapist can never really know when they are done or even how close they are to the intended outcome.

The answer to this conundrum will *not* come from within the field of psychology. In fact, the answer already exists but it is encoded in a language which is very foreign to those in the field of psychology and cognitive intervention. The answer is encoded in the

language of statistical physics. There are four branches of statistical physics that have contributed more to our understanding of human behavior in the last decade than the field of psychology has in the last century. They are thermodynamics (the science of energy), nonequilibrium dynamical system (the science of change), Synergetics (the science of self-organizing, dissipative structures or patterns), and quantum mechanics (the science of the very small). Over the course of the last decade these four branches of physics, in conjunction with the many branches of neuroscience, NLP and the cognitive sciences, have culminated into a single interdisciplinary field referred to as *Cognitive-Neurophysics*.

Foundations for a Cognitive-Neurophysics and a Unified Theory of Intervention

The first text intended to present an in-depth discussion of fundamental principles and methods of Cognitive-Neurophysics will be released in mid-2000 under the title *The Neurophysics of Human Behavior: Explorations at the Interface of Brain, Mind, Behavior and Information* (Furman and Gallo). The purpose of this work is to give the NLP practitioner and the field of cognitive intervention, at large, a simple, predictable model for designing successful interventions for any neuro-cognitive malady as well as accurately measuring the degree to which an intervention has been successful. Much of the groundwork for the field was laid over the last ten years and briefly discussed in previous *Anchor Point* articles dating from late 1995 until 1998. It is the intention of this article to share with you a few of the most fundamental principles and insights elucidated by the neurophysics of trauma and intervention.

Pattern - The Universal Language of Nature

Throughout the history of science, we have actively sought unified theories with which to show how disparate behaviors of seemingly unrelated phenomena were merely different properties of one single aggregate. For many years, electricity, magnetism and light were considered to be quite separate, unrelated elements of the physical world. Through the efforts of many scientists who have constructed testable, unified theories, we have now come to understand that electricity, magnetism and light are merely different properties of a single aggregate namely the electro-magnetic spectrum. Unfortunately, the field of psychology and cognitive intervention have not as of yet been successful in constructing a testable, unified theory capable of guiding intervention and deepening our understanding of the human mind and brain (the neuro-cognitive system).

The first step in constructing such a unified theory entails finding the most fundamental of all elements or processes which are common to each of the things we want to unify. For reasons too lengthy to discuss within the scope of this paper, that fundamental process or element is *pattern*. In physics, *pattern* is synonymous with *information*. They are one and the same. The field of NLP, among others, has suspected this for some time without the ability to produce conclusive proof. The notion of pattern and pattern interruption was first discussed by Dilts, Grinder, Bandler and DeLozier (1980) with regard to the interruption of strategies by overload, diversion and spinning out in their landmark book *Neuro-Linguistic Programming: Volume I: The Study of the Structure of Subjective Experience*.

The Behavior of a Substrate is Necessarily the Behavior of the Pattern it Encodes

Let me offer a metaphor for how nature uses pattern to store information. Imagine for a moment that we are standing before a quiet pond and I have in my hand several rocks and pebbles of varying size and weight. I now ask you to close your eyes and I toss the rocks and pebbles into the pond. After the rocks and pebbles have come to rest on the bottom of the lake, I then ask you to open your eyes and answer a few questions. *How many* pebbles did I throw in? What was the *position* of their entry into the pond? Where did the *largest* ones land? Which of the rocks had the greatest *velocity* (speed) upon contact with the water? Without any hesitation, you are able to answer my questions even though the rocks that I have thrown have disappeared. Without ever seeing the rocks, themselves, you are accurately able to determine the number, location, size and velocity of the rocks. How do you do this?

You are able to do this because nature encodes information in the language of pattern. In this case, the pattern of number, location, size and velocity of the rocks have been encoded by the medium H₂O in its *liquid phase* (water). We could say that the violent entry of these rocks into the quiet, unsuspecting pond was *traumatic* to that pond since it severely perturbed (disturbed) its steady state of symmetry. However, the trauma is not remembered very long. Why? Because the substrate that encoded the traumatic information was in a very *fluid* state or *phase*. Within seconds, the ripples and waves created by the rocks settle back into equilibrium. What would have happened if instead the H₂O was in its solid phase (ice)? In this case, only the heavier rocks would have had enough force to create a perturbation in the pond's steady state. However, the effect of that perturbation would be far longer lasting, as the pattern that the rocks create in the ice would be "remembered" by the H₂O possibly for an entire winter season.

There is an important principle of physics at work here. **Nature uses pattern to encode information, and the memory of that information is totally dependent upon the stability of the substrate encoding it. When the substrate is destabilized, the memory and its effects are gone.** But that's not the end of the story. The stability of the information is not a function of the substrate alone, it is also a function of the phase or state of that substrate. In my example above, the encoding substrate did not change, it was still H₂O. However, the phase or state of that substrate did change - from liquid, a more fluid state to solid, a more stable, tightly coupled, molecular state. Herein lies nature's secret to change. In order to change the traumatic memory that the H₂O has encoded in its *solid* state, we must necessarily cause it to transition to its liquid state. Once this is done, the traumatic stoning memory will disappear in seconds. If then the H₂O transitions back to its solid state, it will do so with no trace of the traumatic memory.

The Ubiquity of Pattern

The field of physics has uncovered a great beauty to nature. That beauty is found in the ubiquity of its fundamental principles. What I mean here is this. When we have truly found a fundamental principle by which nature produces its varied phenomena, that fundamental principle can be found operating in all of its aggregates, living and nonliving, from the simple to the complex. The principle of pattern-encoded information is *ever present* in nature.

Let's consider the example of a traffic accident. If you were to examine a car on the road that was standing all by itself hours after it had been in an accident, again you

would be able to determine the *number* of impacts the car sustained, the *position* or *location* of the impacts, the *velocity* or *intensity* of those impacts and the approximate *size* of the vehicle or structure responsible for the impacts. Of course, there is additional information to be found such as the color of the cars involved which is determined by paint transferred during the impact, and the possible conditions of the passengers which might be determined by the pattern of the broken front windshield, the condition of the seat belts and the resulting size of the passenger cabin. In fact, we can learn so much from the pattern encoded by the metal and glass substrates that the entire accident can be fairly accurately recreated in our minds without ever having been there. It is by the same principle, that we gain insight into the causes of plane crashes and the paths of hurricanes. Why do we not apply the same principles of physics to human beings?

Part of the reason is fear of complexity. While H₂O molecules are a single substrate having only three phases (solid, liquid and gas), the human brain has a seemingly, uncountable number of encoding substrates in addition to a virtually uncountable number of states or phases. However, nature's laws and principles remain unchanged. The purpose of cognitive-neurophysics is to uncover these fundamental principles that are ubiquitous to all of nature's structures and apply them to seemingly disparate human phenomena. When we do so, we open up a world of insight. Nature uses pattern to encode information and that information is phase or state dependent. This is one of the most fundamental keystones to successfully eliminating traumas and producing lasting change in an intended direction.

Pattern Destabilization - The Active Ingredient

Bearing the prior discussion in mind, what is it that all of these successful brief therapies have in common? They all have a way of affecting the pattern of one or more of the encoding substrates of the brain. What is interesting is that each of them, in their scope of intervention, affect a slightly different set of substrates, resulting in qualitatively different results. The active ingredient in each, is that when successful, each method provides a significant perturbation which disrupts the information storage and hence, the processing of the trauma, by disrupting the pattern of the encoding substrate.

The scope of EMDR primarily targets substrates of the visual system (visual mode). The perturbation caused by having the subject rapidly move their eyes while simultaneously attempting to maintain an internal, visual image of the trauma, effectively disrupts substrates of the visual system which have previously encoded the visual stimuli associated with that trauma. Once the visual image is significantly destabilized, in many cases the *initial conditions* (internal stimuli) necessary to experience the emotional (somatosensory) component of the trauma are eliminated - making it nearly impossible to access the associated somatosensory pattern (traumatic feelings) originally encoded by the brain's substrates.

V/KD, which had a similar level of success in the active ingredient study, approaches the destabilization and disruption of pattern in much the same way. The major target for the perturbation is still in visual mode. However, in some cases, we also disrupt submodal behaviors (submodalities) of the visual system. In such a case, V/KD proves to be more effective than EMDR.

Why was TFT so much more successful than the others? The reason is simple. The scope of destabilizing perturbation is almost always larger with TFT algorithms than

with those of any other brief therapy. TFT targets the visual mode encoding substrates by causing the subject to not only move their eyes from left to right, but up and down, and in clockwise and counterclockwise circles, while attempting to maintain the visual component of the traumatic memory. At the same time, TFT also targets the auditory mode by having the subject hum a tune, count forwards and backwards, and then hum a tune again while attempting to *hold stable*, the internal, auditory images encoded as a result of the trauma. Lastly, TFT targets the somatosensory or kinesthetic component of the traumatic memory (the feeling) by having the subject tap rigorously on various sensitive parts of the head and body known to some as acupuncture points and energy meridians, and to others who are students of the martial arts, as striking points. Whatever we choose to call these sensitive areas, they are sensitive because they are regions of dense nerve ganglion that propagate intense electromagnetic and chemical signals in response to vigorous percussion (tapping). This tapping effectively destabilizes the complex, somatosensory patterns we refer to as emotions or emotional states.

In short, TFT was found most successful by Active Ingredient Study at FSU simply because the *scope* of the perturbations prescribed by its algorithms was *wider* than any of the other three therapies, effectively destabilizing *all* of the initial conditions necessary for the brain to successfully replicate the pattern we refer to as the traumatic memory.

Why was TIR the least successful of the four methods studied? While the principles of its effectiveness remain the same, and the subject as in all of the prior cases was required to visualize the traumatic incident, the subject is first required to *view the event silently from beginning to end*, after which the viewer reports what was observed (Gallo, 1999). The problem with this is that the first step in the intervention necessarily strengthens the pattern by causing it to be activated or replicated and then translated to linguistic representational centers of the neuro-cognitive system, without any simultaneous perturbation (disturbance). Unfortunately, as we know, practice makes perfect. And, just as in piano, a *practiced* pattern is performed more perfectly. In short, the first step of the intervention causes TIR to get in the way of itself. The well-intentioned process of silent viewing and verbal reporting is repeated until the viewer arrives at a resolution (a learning). This process dramatically elongates the time necessary for the intervention to result in a significant change. When a change *is* measured, it is mainly because, while the *visual mode* pattern is strengthened (stabilized), the *auditory mode* pattern is weakened (destabilized) by interference from *conversation* between therapist and subject relating to the traumatic event.

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After the research study was over, there was much persuasive argument from each of the proponents of the brief therapy methods represented. In a later NLP workshop, Ed Reese challenged me to test the hypothesis of pattern destabilization. I proposed that any stimuli capable of affecting a perturbation in visual, auditory and kinesthetic modes simultaneously would prove to be as effective in eliminating a traumatic experience as TFT, even without the use of their complex algorithms. The stimuli that I proposed to test the hypothesis with was a game readily found in all children's toy stores called Simon. The object of the game is simply to remember a continually increasing sequence

of sounds and colors, and to replicate that sequence by pushing the correct colors in the correct order.

One by one, subjects were requested to attempt to sustain the internal visual, auditory and kinesthetic images representing their traumatic experience while simultaneously playing Simon with the intention to win the game. The result was as predicted - an immediate destabilization of the traumatic memory and its effects by the end of the first round of the game. The neuro-cognitive intervention took less than 120 seconds in most cases and the perturbation that the game produced continued to increase in complexity automatically until the disturbing images could no longer be sustained by the subject. Incidentally, a mini "keychain" version of the game is now available in many toy stores at a price of only \$5 or \$6 - a 120 second trauma cure on a keychain when used in direct compliance with the laws of physics.

Epilogue

Of course it would seem a miraculous if this was the end of the story. But, it is not. The laws of physics predict a result slightly more complicated than this. In physics, the *stability* of a pattern is assessed by its *resistance to a perturbation*. That means, that very stable patterns can *recover* from perturbation - some very quickly and some very slowly. The *quicker* the recovery, the more *stable* the pattern. This pattern recovery is referred to as the *regulation* - a fundamental property of a morphogenetic field. Many practitioners of psychotherapeutic and neuro-cognitive interventions have experienced this phenomenon to their dismay. A trauma or phobia that they assumed was completely eliminated, soon returned. Why this occurs, and what is necessary to create a *lasting* change will be the subject of our next article.

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