

# **Chaos Theory: Creativity, Waking and Dreaming Life, Psychopathology, and Art**

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Chaos theory, part of the science of nonlinear dynamics, offers guiding metaphors for understanding the individual and social transformations that are inherent in creativity, in waking and dreaming life, in psychopathology, and in works of art. Chaos theory first appeared in the late nineteenth century mathematics of Henri Poincaré, but it was not until Edward Lorenz's twentieth century research at MIT with computer generated weather patterns that nonlinear dynamics entered mainstream science. Chaos theory is the study of dynamic transformations where bifurcations are the major trajectory changes. Yet in order for bifurcations to take place, a system must destabilize. Destabilization is both a time of chaos and an agent of change. It is in this far-from-equilibrium condition that old parameters fall away and multiple possibilities become available creating the dynamic chaos that brings forth new order.

In *Abnormal as Exceptional: Creative Insight at the Edge of Chaos*, Ruth Richards uses nonlinear dynamics to explore the link between bipolar disorders and creativity, finding compensatory advantages in the condition's symptomatology and in its genetics. She cites Fred Abraham on creativity and demonstrates that what has been labeled pathological may instead be creative.

Stanley Krippner applies chaos theory to nighttime dreams in *Dreaming as a Creative Life Force*. Investigating the complexity of the self-organizing brain in response to multiple stimuli during rapid eye movement (REM) sleep, Krippner presents evidence that the philosophical, artistic, and scientific insights emerging in dreams are "edge of chaos" phenomena.

Tobi Zausner, who investigates the creativity of visual artists in her presentation, *Artists and Substance Abuse: Misguided Searches for a Creative Chaos*, notes similarities between the dynamics of chaos in the creative process and in the personality of the artist, finding that certain artists turn to addictions as a misguided attempt to restore the chaos of their creativity.

## ***(1) When the Abnormal Is Exceptional: Creative Insight and Chaos Theory***

Links between bipolar disorders and creativity are well documented. Nonlinear dynamical processes are suggested by such creativity. These may help us understand, not only bipolar-based creativity, but creativity in everyone.

There may be—similar to sickle cell anemia—a compensatory advantage linked to milder and even psychiatrically “normal” manifestations of an underlying risk for bipolar disorder. As with sickle cell, which offers resistance to malaria, bipolar risk comes with a potential benefit: enhanced creativity. An inverted-U relationship with symptomatology is suggested, neither too much nor too little. Mild mood elevation appears optimal. Results may generalize to everyone; mood elevation can increase creativity for us all.

Despite its origins, the creativity itself tends, all else being equal, to be healthy, adaptive, even resilient, perhaps also protective.

Abraham proposes, for creativity in general, a tension between divergent and convergent processing, generating chaotic attractors. Brain research in other areas suggests new stimuli may evoke new attractors, transforming a chaotic ground state to a new “answer.” Results may apply to the creative AHA! Moment. Supporting the inverted-U, for people at bipolar risk, mild bipolar thought disorder is found in first-degree relatives of manic-depressives—and on a Torrance Test it could be called creative.

Preference data supports human enchantment with fractal forms, which indeed relate to underlying strange attractors. Patterns with a “mid-dimensional complexity” seem most appealing. The minority group, in one study, participants who preferred higher dimensionality than the norm, gave reasons consistent with certain creative personality traits. Is there a disposition toward resting closer to a mental “edge of chaos”? To liking the AHA! Moment? Association of creativity with mild psychiatric risk, for some people, reminds us to “expand our acceptable range of normality.” The “abnormal is not necessarily pathological,” and in some cases, it may be usefully, and creatively, exceptional.

## ***(2) Dreaming as a Creative Life Force***

Both chaos theory and complexity theory can be applied to the study of nighttime dreams. The latter allows an examination of the self-organizing properties of the brain, while the former can investigate how this complex self-organized brain can, in dreaming, respond to subtle influences such as residual feelings, wishes, and memories, especially (but not exclusively) in rapid eye movement (REM) sleep. “Organizational resilience,” a term borrowed from the business world, can be used as a metaphor to describe the “teamwork” that characterizes the coordination of dreaming brain’s component parts, such as neural networks, to create dream narratives. The term also can be used as a descriptor for the experiential dream group, a collaborative process that acknowledges the dream’s complexity and uses non-authoritarian dialogue to help dreamers derive meaning from dream reports. Finally, the scientific, philosophical, and artistic insights emerging from dreams may represent material “at the edge of chaos,” illustrating the illumination phase of the creative process. Examples range from Descartes trio of dreams that launched his philosophy, the regular use of

dreams by the writer Robert Louis Stevenson, and Otto Loewi's discovery of neurotransmitters as a result.

### ***(3) Artists and Substance Abuse: Misguided Searches for a Creative Chaos***

Artists create their work in conditions of disequilibrium far from the confines of homeostasis. In these far-from-equilibrium situations, they are in a state of creative chaos, a time that may look turbulent but is capable of bringing forth new order. By absorbing information from the environment and discharging it negentropically as new work, artists can be modeled as dissipative systems. In nonlinear dynamics dissipative systems are fueled through an open exchange of energy with the outside world. Although an artist in the turbulence of creativity is an extreme example of a dissipative system, all individuals can be modeled as dissipative systems because everyone is in a state of chaos that continually brings forth the new order of their ongoing existence. A characteristic of chaotic systems is that they have an extreme sensitivity to stimuli, which is why thoughts and feelings, both conscious and unconscious, can cause profound responses in people. These responses can generate positive experiences, such as those occurring during a time of creativity when inspirations guide a work to greatness. Conversely, when untreated mental illness inundates a person with a cacophony of unwanted stimuli, the experience can become very negative. In response to this extreme discomfort certain individuals will turn to substance abuse in a misguided effort to stop the pain of unresolved emotional issues. Falsely believing that it will return them to a creative chaos, they fall instead into the stagnation of addiction and the co-occurring disorders of substance abuse and mental illness. Untreated mental illness and addiction to substances have shortened the lives of artists such as Vincent Van Gogh, Frida Kahlo, Henri de Toulouse-Lautrec, and Jackson Pollack, who all committed suicide. In contrast Edvard Munch and John Callahan, who addressed both their emotional problems and their substance abuse, continued to live and remain creative.

(4) Commentary by Fred:

<http://www.blueberry-brain.org/dynamics/FredAPacommentary.pdf>

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