

Shifting The Strange Attractor: An Exploration of Chaos and Change Agency

INTRODUCTION

Painters, poets, and musicians have long known that creativity blossoms when they are participating in chaos. Novelists strive for that magical moment when they lose control and their characters take on lives of their own. ... the creativity inherent in chaos suggests that actually living life requires something ... an aesthetic sense—a feeling for what fits, what is in harmony, what will grow and what will die. Making a pact with chaos gives us the possibility of living not as controllers of nature, but as creative participants. [\[1\]](#)

(John Briggs, and F. David Peat, Seven Life Lessons of Chaos, 1999)

Mediators, facilitators, and systems theorists look at situations in similar ways. All see webs of interconnectedness among a system's elements. All find it difficult to analyze one element, person, or situation in isolation from the fullness of the context within which they exist.

What does chaos theory have to offer conflict resolution professionals? Chaos theory encourages identification and exploration of patterns and the factors that give rise to sustaining or disrupting those patterns. By understanding more about the nature of complex systems, conflict resolution practitioners can gather new insights into ways they can help people achieve their goals and foster lasting change. These ideas challenge various facilitative practitioners to acknowledge that they are in the mix with those they work with – predetermining what they will and will not see as the problem, foreclosing some resolution options even as they open doors to find new ones.

A (VERY) BRIEF OVERVIEW OF QUANTUM AND CHAOS THEORIES

Physics, like most sciences, reflects the incremental work of multiple minds sifting the results of innumerable questions and experiments. In 1905, Albert Einstein's Theory of Relativity shattered the prevailing linear and mechanistic views of the universe by demonstrating that, while the laws of physics are constant everywhere, perceptions of reality and measurement of objects or events are specific to each observer. For example, whether someone reading a newspaper on a train is described as "moving" or "still" varies with the observer's position (standing beside the track or looking across the aisle at the seated passenger on the train.)

While Einstein's work at the level of the macroscopic (larger than atoms) tended to reinforce the Newtonian idea that science could predict the behavior of objects and systems with precision, the behavior of newly discovered subatomic particles seemed

to defy those rules in very strange ways.

Max Plank, (1858-1947) known as the father of quantum physics, showed that in the world of subatomic particles, the most basic elements were not "elements" at all. According to Plank, these subatomic particles were more properly described as packets of energy, or "quanta," with peculiar properties all their own. Plank, joined by other physicists in these explorations, revealed that seemingly "chaotic" collections of particles might be suddenly transformed into a coherent system containing visible and orderly structures. Similarly, he and his colleagues showed that orderly systems could also—without apparent cause—descend into chaos (hence the name "chaos theory.")

The Uncertainty Principle

Werner Heisenberg (1901-1976) contributed yet another piece to this emerging puzzle of the behavior of particles and systems at the subatomic level. By studying the behavior of various subatomic objects, Heisenberg demonstrated that observers can never know both the true position and velocity of a (subatomic) object at the same time. His Uncertainty Principle holds that one necessarily obscures some attributes of a system by choosing to measure others.

As a case in point, scientists that had disputed whether light consisted of particles or waves set out to determine its "true" nature. One theory held that light consisted of waves of energy, while a competing theory asserted that light consisted of a stream of particles. When scientists assembled equipment designed to detect waves of energy, they observed light to be an unbroken stream of energy, undulating in predictable waves. When they assembled equipment to test the competing theory, they discovered neatly organized "packets" carried within the light stream traveling at a constant speed. Improbably, light had been proven to have the characteristics of both particles and waves—but could never be seen to have both properties at the same time. Both ways of measuring the attributes of light work, but bringing one into focus forces the other to recede unseen into the background.

Strange attractors

Edward Lorenz (1917-) was among the first to create a portrait of a quantum system. Through his work trying to predict the behavior of simple weather patterns, Lorenz demonstrated three significant attributes of every quantum system. First, his diagram showed that complex systems are sensitive to initial conditions (input influences output.) Second while individual outcomes or events cannot be predicted with certainty, all outcomes would fall within predictable parameters. From these first two points, a third important attribute became clear, namely, that while the outcome of one event may not be precisely knowable, complex systems will, over time, self-organize into surprisingly stable, and even beautiful, patterns. The most popular image to take

hold as a result of Lorenz' work is known as "the butterfly effect." Simply put, this theory implies that complex systems are so exquisitely sensitive to even the smallest perturbations, that the flutter of a butterfly's wings on one side of the world can lead to a tornado on the other.

The organizing force inherent in Lorenz' intriguing patterns of complex systems is called a "strange attractor." One of four different types of attractors identified by quantum physicists and mathematicians, strange attractors catalyze the system to take on a durable, patterned structure that is replicated at all levels. These self-similar structures are called fractals. Sometimes, fractals are nested like Russian dolls. In other instances, they line up or spread out in patterns (like sodium or other crystals after the water has evaporated.) Fern fronds are fractals because the basic fern shape is the same whether you are looking at the whole frond or at one of the leaves on its stem. Strange attractors ensure that while each individual specimen is unique, snowflakes look like snowflakes, and that broccoli florets, oak trees, and maple leaves consist of self-similar and repeating (fractal) patterns.

SENSITIVITY TO INITIAL CONDITIONS: WHEN DOES CHANGE BEGIN?

In many respects, a system's members begin paving the way for change just by anticipating the moment it will begin. Just as quantum systems are sensitive to their initial conditions, people faced with an impending change "infect" the interactive field between them by thinking and talking about what might be gained, what must be protected, and which consequences of action or inaction cannot be tolerated. In some instances, there is a feeling that "change is in the air." In other situations, particularly those where conflict has been intense and protracted, the prospect of mediation or another intervention can heighten everyone's awareness of their difficulties—sometimes escalating the conflict even further.

For the prospective conflict manager, the moment of entering the system arrives with the first telephone call, email, or casual conversation. Because any observer will help to shape what he or she can see by choosing what they will measure, conflict managers begin to influence a system with the first questions they ask about the nature of the problem. Discussions about the mediator or facilitator's role, the length of time he or she will remain involved, and ways everyone will measure the result will have a determinative effect on what and how much of the organization's dynamics are revealed, and how much remains hidden.

ALL OUTCOMES WILL FALL WITHIN PREDICTABLE PARAMETERS: SEARCH FOR PATTERNS

Effective mediators, facilitators or other conflict managers often develop an uncanny ability to recognize patterns in social systems, organizations, and other human

relationships. They use this information to find and exploit “tipping points” that can lead to change. Some are capable of deconstructing the present social, political, economic, or cultural environment to make room for change. Others may have a “sixth sense” for capitalizing on hidden undercurrents to facilitate change. Good instincts, however, are not the only way conflict managers can learn to see important patterns.

Self-organization is foundational to chaos theory. Physicists devote considerable energy to the question of how systems take on the shapes that they have, and note just how durable those patterns of organization are when they arise. What physicists are able to prove time and again is that unless the fundamental forces—or strange attractors—are shifted or transformed in some way, the system is unlikely to change.

Mediators, facilitators and other conflict managers regularly experience instances where the people and organizations they work with may appear to have changed their patterns of communication or behavior—only to learn later that the good intentions and apparent consensus had evaporated, or receded far into the background. Whole communities shocked and displaced by natural disasters like fire, landslides, earthquakes, and hurricanes are often no different. Once the disaster has passed, these same communities typically rebuild on the same cliffs, landscape with similarly fire-prone plants, and reconstruct housing, commercial, and industrial developments along the most active fault lines or within the reach of seasonal hurricanes. Just as physicists know that chaotic systems will stabilize into predictable patterns unless the strange attractor has changed, conflict managers know that it is not enough to **wish** to change. Human relationships and social systems cannot accomplish lasting change without a significant shift in the underlying forces that perpetuate undesirable, dysfunctional, or destructive behavior.

Because people have choices they can make, and individuals differ one from another (even when they share underlying interests) the outcomes of a particular intervention cannot be predicted with certainty, but they can often be predicted to fall within expected parameters. By exploring the dimensions of these patterns, conflict managers become better able to help people see which of their familiar patterns or habitual behaviors is most like the strange attractor that compels a quantum system to return to its original design

Gareth Morgan, a Canadian expert in organizational development^[2], uses chaos theory as a lens through which to view systems. Relying on the principles articulated in these theories, he encourages change agents to begin their interventions by asking:

- What are the significant loops (patterns) defining the system?
- Are there principle subsystems (or nested loops) that add to an inability to change?
- What are the generative forces that underlie the inability to change?

- Where is the best place to intervene?
- Are there manageable initiatives that can be undertaken now?
- What new contexts might be created to “nudge” the system in the desired direction?

Part of what makes Morgan’s questions so interesting, is that they force the intervener to look more deeply into the workings of the systems they encounter to uncover leverage points that, if exploited, can spark lasting change. Just as it is important to see the most obvious system patterns, it is critical to search until you can find the forces that make the pattern durable. It is not enough to see that there are entrenched patterns of conflict. It is more important to notice the patterns *within* the conflict. Once identified, these patterns shed light on the underlying forces that must be redirected if the system is to change in any meaningful way.

Morgan’s final two points exemplify a central idea in his theories of how to facilitate change—namely, that some kind of change should be undertaken early in the process. He believes that system participants gain an appreciation for what they can accomplish by figuring out ways to begin changing “now.” Morgan’s approach has an added benefit in that it allows system participants to start “small,” thereby helping the conflict manager to test the validity of the proposed approach.

COMPLEX SYSTEMS WILL SELF-ORGANIZE OVER TIME: BE WILLING TO CULTIVATE CHAOS

Chaos can often be a very good (if uncomfortable) experience. Many complex systems oscillate between stable and chaotic states. In fact, it is the disorganization associated with chaos that often provides the most fertile ground for instituting new initiatives or behaviors. A pot of water that is gradually heated becomes so intensely agitated by the air boiling away from the heat source, that the water is vaporized. The imminent collapse of a corporate giant can sometimes be the very catalyzing force required to allow a complete restructuring of its business practices, and therefore, a reinvigoration of its presence in the world market.

By capitalizing on the existing chaos, or unsettling established patterns to introduce it, conflict managers can help people learn to use chaotic events, feelings, and forces as a tool for “wiping the slate clean,” or introducing a “breath of fresh air.” If introduced with care, the experience of not knowing, of not being able to rely on habitual practices can be just the intervention that is needed. Against a chaotic backdrop, new ideas, behaviors and practices can become the strange attractors that help to galvanize new relationships and embed new operating norms.

In the spirit of introducing some measure of chaos to facilitate change, consider ideas advanced by Peter Berger and Thomas Luckmann nearly forty years ago^[3]. To help

individuals accept change, these social scientists recommended promoting a creative tension or a cognitive dissonance, to facilitate action toward the goal. This must be accomplished, however, without overshooting the mark and creating resignation or backlash. For a visual image of this creative tension, imagine you have stretched a rubber band between your thumbs. One end represents where things are now. The other end is the envisioned future. By anchoring the journey to their preferred future in an appreciation for what exists today, the conflict manager is bracketing the group's experience in a way that allows the path between today and tomorrow to be connected by manageable tasks rather than a looming abyss.

SHIFTING THE STRANGE ATTRACTOR: REACH FOR SUSTAINABLE CHANGE

As the inquiry into the inner workings of a system continues, conflict managers develop their own ideas and approaches to facilitating change. Some focus on helping individuals and groups to build new communication practices. Others might find ways to give voice to the people or ideas that are typically excluded. Each conflict manager will have slightly different ideas about where to start in a given situation. It is the attention to patterns inherent in the systems conflict managers encounter that reveal critical information these professionals can use to anticipate how, and when, their efforts can be best used to secure lasting change.

Wherever you choose to begin, the interventions that are more likely than not to succeed over time are integrated at multiple levels, and become part of the newly emerging story of "how things are." Successful conflict management practitioners learn to help people shift themselves and each other to maximize the degree to which the change has become part of the family, organizational, or business "organism," and to minimize the potentially destabilizing effect of the facilitator's exit.

CONCLUSION

Mediators, facilitators, and other conflict managers can have a profound impact on the future direction that a family, business, or organization takes—and this influence begins with the first conversation. By learning more about the nature of complex systems, we extend our own ability to marshal the tools, resources, curiosity, and intent needed to help people find order in chaos, or use the uncertainty of chaos to craft healthy and durable relationships and organizations.

Metaphor has always been a powerful lens through which people can gain new insights. These concepts invite mediators, facilitators, and other conflict managers to look at their work in new ways—to begin seeing themselves as creative participants and intentional catalysts for change. Change cannot be initiated in a vacuum. Neither can it be implemented without a rich understanding of the current reality and, (at least in the change agent's mind), a firm belief that the future can be different. No matter

what approach a mediator or facilitator takes, their ability to influence clients in diverse contexts will be tied, at least in part, to their ability to tolerate ambiguity and chaos, and to learn to see the often obscure but powerful patterns that may emerge. Chaos theory provides a lens to help perceive and work with these critical patterns.

REFERENCES

- [1](#) Briggs, J., Peat, F.D. Seven Life Lessons of Chaos. HarperPerennial. 1999. 8.
- [2](#) Morgan, Gareth. Images of Organization. Thousand Oaks, London, New Delhi. Sage Publications, 1997.
- [3](#) Berger, Peter L., Luckmann, Thomas. The Social Construction of Reality: A Treatise in the Sociology of Knowledge. New York, Anchor Books. 1966.