

Selections from the Readings in The Hakomi Method

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Why Complexity Theory Is Important

A recent mathematical theory of great general application is complexity theory (sometimes called chaos theory.) It describes the organization and dynamics (the behavior over time) of complex systems. By either name, it's a wonderful tool for thinking about all kinds of things. For our purposes, it's an important way to think about intelligence, dysfunction, trauma, development and it even helps a bit with the four noble truths. We don't need to go into the math itself; we can use the ideas in a general way to help us think.

First, let's look at another mathematical tool, the bell curve. I want to use the curve in a metaphorical way to discuss a special class of systems. Loosely, they're called living systems. The bell curve describes the distribution of natural phenomenon, like the height of humans over large populations. Very tall people are few in number, as are very short people. The great majority are near the center of the distribution. Natural events have a strong tendency to combine in ways that allow us to visualize them by using this graceful curve.

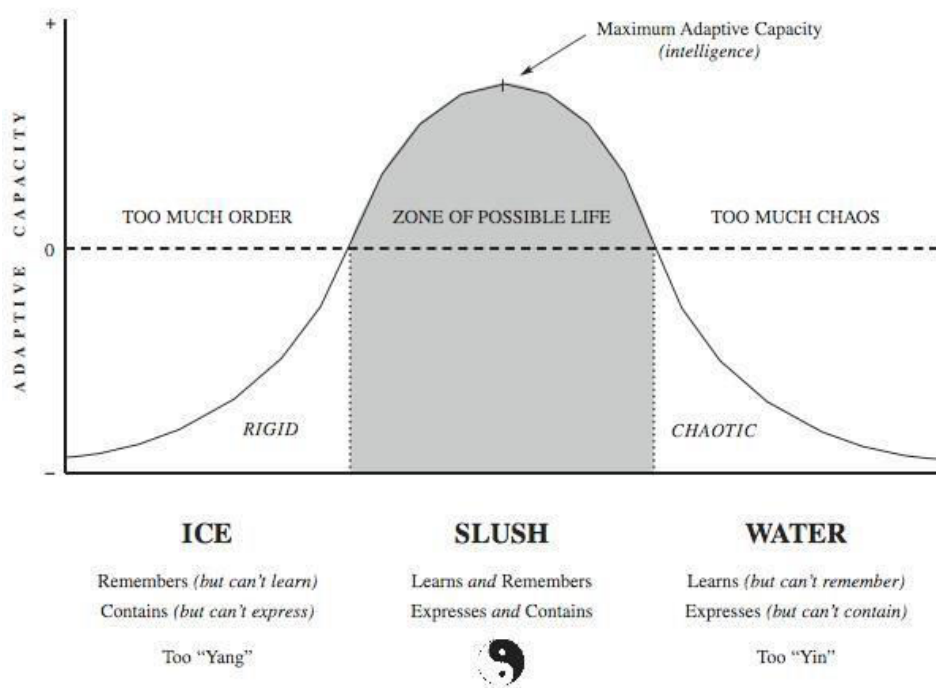
John Holland writes about complex adaptive systems, systems with many independent agents that communicate. These independent agents can be individual living organisms. Or, they could be neurons or groups of species. Holland is also thinking about players of the stock market, and possibly chemicals in solution that self-organize into complex, oscillating patterns. For our purposes, the curve can be used to describe something essential about life in general and psychological health in particular. Let's look at the curve with those things in mind (See figure Complex Adaptive Systems below.)

Think of the varying states of water. For leaving an imprint, ice doesn't work; it is too solid and hard. Water doesn't either; it is too loose. But, you can leave an imprint in slush. Slush is malleable and stable enough to hold an imprint. It has memory. There's a zone in the curve where both change and memory are possible. This is the zone between the crystal fixity of ice and the frivolous anarchy of water, between the unchangeable world of rigid order and the chaos of uncontained variation. Too much order and life cannot adapt. Too little order and life cannot hold its shape. Life needs to both remember and adapt. Too much order is death by freezing; too much change is death by dissolution. Life can only exist in the zone between order and chaos.

John Holland talks about complex adaptive systems this way:

“Complex adaptive systems (CAS) consist of many interacting components, called agents, that adapt to (or learn from) each other as they interact. Stock markets and immune systems are familiar examples of CAS. Even on relatively short time-scales, CAS exhibit a range of non-additive (nonlinear) effects: self-organization, chaos, fractal attractors, frozen accidents, lever points and the like.” (Holland, *Emergence: From Chaos to Order*, 1996)

COMPLEX ADAPTIVE SYSTEMS



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Figure 1 Maximum Adaptive Capacity.

We can also say that being generative and creative requires something in the direction of chaos, something that brings new things forth. And from all that is brought forth, some limited numbers are selected. This selection process is based on "selection rules" which have their influence by virtue of their fixity. The laws of physics are an example: the long-term conditions that select for one species over another. This combination of generation and selection is the most general characteristic of life. It is expressed in the long term, over millions of years, as the process of evolution. In the short term, in seconds or less, it is intelligence, according to Calvin. (Calvin, William H. (2001). *How Brains Think: Evolving Intelligence, Then and Now*)

There's more to this than metaphor. At the peak of the curve, there's a maximum where, for a given environment, the best integration of order and chaos occurs. This is the point of maximum adaptive capacity. It is the point on the curve where the right combination of resources to select from and the good sense to choose wisely combine.

In Christopher G. Langton's terms, where a complex dynamics of information processing can emerge spontaneously and come to dominate the dynamics of a physical system (Christopher G. Langton's article, *Life at the Edge of Chaos*). As we'll see, this metaphor can describe how complimentary functions are integrated and balanced. All these descriptions yield zones of failure, zones of effective functioning, and peaks of performance. Some of the psychological functions we'll look at this way are affect regulation, particularly in the management of painful experiences (usually called "defense mechanisms"), the ability to stay present, aliveness, and our relationships to time, energy and excitement.



So, the reason complexity theory is important is that it can help us think about life, psychotherapy and intelligence and link many seemingly different fields. Let's look at some of these.

Self-organization

Under the pressure to move through a narrow space, like a faucet, water spontaneously braids. The water changes the way it is organized, from a simple laminar flow, it becomes a complex, twisted group of columns. This “escape to a higher order of complexity” as it's called, allows more water to pass through the faucet per unit time. The water spontaneously transitions to a more complex organization. This is a simple example of self-organization at the physical level. All kinds of things, physical and otherwise, do that. Under the pressure of evolutionary forces, all of life self-organized onto higher and higher levels of complexity.

Understanding self-organization allows us to think about the formation of complex systems, without having to infer an external designing intelligence. It shows a creative power existing within the natural world itself. Complex adaptive systems, of which living systems are one example, have the power to evolve to greater and greater complexity.

Organisms of vast complexity evolved from so simple a beginning! Human brains demonstrate astounding levels of complexity. It only needs “many agents communicating,” agents like neurons, people using the internet, cells of the immune system, voters, stock market players, participants in groups of all sorts.

Psychology

There are various influences operating within systems that self-organize. Some that are significant for psychotherapy include: genetic inheritance, the behavior of caregivers, nutrition, culture, environmental toxins and experiences of all kinds, trauma included. Once a system takes a particular developmental path, it “settles” into that path and tends to stabilize itself around the levels of variables that maintain the path. “Once a thief, always a thief,” was a phrase used back in the forties. Complex systems must be both stable to some extent and flexible and adaptive in another. Universally, living systems have needs for both integration and awareness.

Here are some examples from *The Developing Mind* (Siegel, Daniel J. (1999) *The Developing Mind: Toward a Neurobiology of Interpersonal Experience*) that integrates scientific discoveries from such diverse fields as neurology, developmental psychology, psychotherapeutic method, infant-caregiver interaction, behavioral types, brain research, memory, emotion and a little complexity theory. I

Each of us has a ‘window of tolerance’ in which various intensities of emotional arousal can be processed without disrupting the functioning of the system. For some people, high degrees of intensity feel comfortable and allow them to think, behave, and feel with balance and effectiveness. For others, certain emotions (such as anger or sadness) or all emotions, may be quite disruptive to functioning if they are active in even in mild degrees.

Siegel's window of tolerance is another example of the curve. There's a zone of effective functioning between two ways to fail—fire and ice. Tolstoy wrote “Happy families are all alike; every unhappy family is unhappy in its own way.” Within their windows of tolerance, people function effectively at least to some extent. Outside the window, they fail. They either get chaotic



and disorganized or they freeze, shut down, numb out, get rigid and lose contact. In the effective zone, one manages present experience without bogging down in indecision or repetitions of actions that don't meet the present situation successfully. There's a beautiful interpretation of the Buddha's talk on the Four Noble Truths in a book called *The Feeling Buddha* by David Brazier. Brazier talks about the Third Noble Truth very much like a "window of tolerance." This convergence of psychobiology in a completely modern work like *The Developing Mind* and the words of an enlightened being spoken twenty-five hundred years ago is cause for celebration. It's also worthy of a short digression.

Brazier says this:

"The Third Noble Truth is Nirodha. This word means to 'confine.' Nirodha originally meant an earth bank. Ni means 'down'. The image is one of being down behind a sheltering bank of earth or of putting a bank around something so as to both confine and protect it. Here again we are talking about the art of controlling a fire."

(Brazier, David. 2002. *The Feeling Buddha: A Buddhist Psychology of Character*)

And what winds does the Buddha say fans this fire out of control? The outward flow of the mind towards objects is impelled by the dangerous wind of greed, hate and delusion.

Siegel has this to say about Attachment and Emotion Regulation:

"Given the important role of emotions in creating meaning, it is understandable why the biological system that helps organize the self is so crucial in determining our subjective experiences in life. The view that has been proposed earlier, and that is explored further here, is that human emotions constitute the fundamental value system the brain uses to help organize its functioning. The regulation of emotions is thus the essence of self-organization. The communication with and about emotions between parent and infant directly shapes the child's ability to organize the self."

Again, we see a connection. Emotional regulation is exactly what the Third Noble Truth is talking about. Don't be blown out of your window of tolerance! Don't go out of the zone! Stay contained. Stay present! Stay alive and be intelligent! That's the Basic Survival Plan of life. Self-organization maximizes at the peak of the curve. It is the home of the "higher self" as shown by one's ability to handle life's challenges within a zone of calm, flexible, intelligent, fully functional states of mind. It is the self, integrated.

Finally, we can see the long history of this approach in the traditional Chinese value system, going back thousands of years and expressed here in a quote from the Richard Nisbett's wonderful book (Nisbett, R. (2003) *The Geography of Thought: How Asians and Westerners Think Differently... and Why*).

"Chinese social life was interdependent and it was not liberty but harmony that was the watchword—the harmony of humans and nature for the Taoists and the harmony of humans with other humans for the Confucians. Similarly, the Way, and not the discovery of truth, was the goal of philosophy. Thought that gave no guidance to action was fruitless. The world was complicated, events were interrelated, and objects (and people) were connected "not as pieces of pie, but as ropes in a net." The Chinese philosopher would see a family with interrelated members where the Greek saw a collection of persons with attributes that were independent of any connections with others. Complexity and interrelation meant for the Chinese that an attempt to understand the object without appreciation of its context was doomed. Under the best of circumstances, control of outcomes was difficult."



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I want to speculate on a possible interaction between memory and emotion. Again, we can use the curve. There's a zone in which the level of emotion makes an event meaningful and therefore important to store in memory; too little emotion, no reason to remember. Too much emotion and memory can fail in any number of ways: distortion, repression, interruption. There's an emotional window of tolerance for efficient memory.