

REDEFINING NORMAL

The constancy of change is the theme repeated often and variously through the symphony of life. Nothing stays the same, whether change is expressed in the eons of shifting geography, in the momentary serendipities of our days, or in the milliseconds of fluctuating cellular chemistry.

Intrinsic to change is unpredictability. We know, at the cosmic level, that change itself is predictable. But at the level of the details of ordinary life, we have no idea what's going to happen next. Change is non-linear and multi-dimensional.

No one disputes that, yet we live in a world often dominated by linear and uni-dimensional thinking. Many of the ideas that we cling to are completely counterintuitive to what we understand to be the fundamental nature of change. Yet we cling to them nonetheless, as if it were possible to freeze-frame things as we want them or like them or are used to them, and then keep them as they are. Our everyday common sense thinking and behavior is normally more aligned with uncertainty than our wishful thinking, however.

- We listen to stock analysts on the news daily, attempting to say what the markets will do. Yet no two analysts agree, and the markets do whatever they do, surprising everyone, and providing new information for analysts to chew on the following day. We remain cognizant of the risks as we invest.
- We watch the weather channel and look at long-range forecasts, planning accordingly, but even in the face of a predicted five days of warmth and sun, we always take along a jacket, an umbrella and rain gear.
- We take extreme precautions as we watch the path of hurricanes or major storm cells heading anywhere near our general direction, because we understand we won't know until the very last minute where these weather systems will go, regardless of the sophistication of tracking methods.
- We have our cars serviced and check brakes and tires before we begin a long trip, but we wear seat belts and practice caution because we still can't anticipate what other drivers might do, and what unforeseen risks might appear at any turn of the road. We know no amount of preparation can assure a flawless journey.
- We set out on our routines each day, expecting the usual but knowing that, by the end of the day, we will look back and be surprised by information, encounters, situations and events that we never considered as we locked the door behind us in the morning.
- We laugh at our own worrying, even as we continue to worry, because it's common knowledge that people never worry in advance about the thing that

actually happens, regardless of how many worries they conjured up in advance of something.

As a student, originally, of literature and philosophy, I recognized that the paradox of variability and certainty has been a dominant metaphor in human expression, since the beginning of time. People's thinking has always included both. Later, as an amateur student of physics, I began to think that the source of our fascination with this paradox is deeply embedded in the nature of all things, of which we are a part. And recently, I heard a lecture by Dr. Ary Goldberger, an Associate Professor of Medicine at Harvard Medical School who is director of a laboratory for nonlinear dynamics in medicine, which brought the arts, philosophy and physics together in a vision for health that describes "mode-locking" (i.e., predictability) as "pathological" and unpredictability as "robust and adaptable."

A memorable, and easily understandable, example he offered was the human heartbeat. Showing a healthy, normal heartbeat, as depicted on an electrocardiogram tape, he demonstrated that there is no characteristic or preferred time or frequency, but there is an overall pattern that suggests high variability, yet appears dynamic and lively. Showing the heartbeat of a person near death, again on an electrocardiogram tape, he demonstrated a constant, highly regularized, frequency. The difference was like looking at a spectacularly craggy alpine vista, *vs.* looking at a straight road with speed bumps. With associates, Dr. Goldberger had translated the intervals of the healthy and unhealthy heartbeats into musical notes. The "healthy" music was haunting, melodic and soothing. The "unhealthy" music was monotonous, atonal and upsetting.

Dr. Goldberger offered a definition of healthy functioning as "restoring creative playfulness". He offered a definition of disease as "decomplexification". By that, he meant something different from simplification, since he explained the simplicity of self-organizing fractals buried in the complexity of unpredictability. By "decomplexification" he meant the absence of unpredictability, the reduction of non-linear variability to linear certainty, a precursor of illness and death.

He defined the predictability/unpredictability, linear/non-linear paradox in terms of science, which habitually breaks things down into linear questions. For example, we study the heart as a separate organ, without regard to the fact that it exists in an exquisitely complex and delicate interface with all the functions of the body, and is in constant dialogue with other systems as life is continually sustained. From such study, we learn a lot about the heart and how it works, but we don't learn that much about life and how it works. Non-linear study would embrace "chaos," which he described as "the discovery that you could get irregular behavior from systems that are mathematically not random." That is to say, systems that appear predictable contain unpredictability. Life, as an illustration, appears predictable: we are all born, we all live, we all die. And yet within

that predictability are infinite potential occurrences. The heartbeat appears predictable – *lub-dub*, *lub-dub* – yet within the *lub-dubs* are random peaks and valleys of energy.

Dr. Goldberger’s lecture continually comes to my mind, inspiring questions about the way we think about our own mental well-being and that of others. We think in terms of normal and abnormal as predictable and patterned thought content. We define what a “normal” vs. an “abnormal” response would be to life situations. A normal person would think thus and so; an abnormal person would think thus and so. So we consistently try to adjust the abnormal back to more normal thought content.

The implication of Dr. Goldberger’s definition of health would change this. We would see the thought process as a constant variable, producing highly unpredictable peaks and valleys, but operating in a predictable way. That is, thinking itself is not a random system. We are always thinking from birth to death, so it is determined and predictable that we do and will continue to produce thoughts. Yet within that deterministic system is the possibility of highly irregular, unpredictable events. We can think anything and there’s no telling what anyone might think from moment to moment.

For me, this redefines normal and abnormal. It is normal **to** think. It would be abnormal (i.e., one would be dying or dead) when the process of thinking slowed or stopped. Normal and abnormal are designations of the activity of thinking, not of the content of thinking. The content of our thinking, what thoughts we think, is unpredictable. It is ever-changing and ever-changeable. Thus we would not define ourselves and each other even by repeated thought content, but by the ability to continually generate thought content. And this would change the way we address mental well-being profoundly.

Reflect on it. Intuitively, just as we make our specific plans knowing that they probably have little to do with the actual responses we’ll be called upon to make to life, we define ourselves by our habitual thoughts, knowing that if they are unresponsive to life, we can change them. We say we don’t like change and we don’t want to change our minds, and yet we embody change within the very molecules of our being, and we change our minds all day long in order to navigate daily vicissitudes.

Intuitively, we know we all have good days and bad days, crazy thoughts and wise thoughts, high ideals and low temptations. None of us wants to be defined indefinitely by our worst thoughts, or held constantly to our best. We are, by virtue of being alive, defined as the thinkers of our thoughts, as sentient beings. We are, by virtue of being free within our lives, to think at random, in a rich turbulence of ideas and images. We live at peace and in well-being, in Dr. Goldberger’s words, “in the cascading waterfall that is our healthy physiology.”

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