# ORDER AND DISORDER IN TURBULENT TIMES

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**Keynote Address**
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## PROGRAM CITATION

### "Order and Disorder in Turbulent Times"

"Social work's person-in-environment focus is right, as far as it goes. But the environment in which we function is an incorrigibly more complex universe than our traditional training has allowed us to believe, and we are left with two apparently contradictory things: order and chaos. What laws do we have, what laws can we invent, to explain the organized complexity of our daily existence? How do we locate the simplicities?"

## PREAMBLE

Social workers are storytellers. Permit me to tell you a tale.

Before I taught child and adolescent development in a university ... my chief qualification, being that I had no direct experience in raising children and was, therefore, unencumbered by bias, I worked in a multidisciplinary clinic for children who were in elementary school, in a large public urban school system. As part of that 8-year wonderful professional experience, the staff and I came to know this province's first neonatologist, who virtually single-handedly changed delivery and perinatal management practices. He also did audacious and unpopular things like making social workers, and families, part of his neonatal interventive approach. He facilitated the development of a second neonatal intensive care unit in this city. It was in this unit that my godson was born in 1976, 2 1/2 months early and weighting 3 lbs 4 ozs.... born to the woman that had been the teacher in our Education Clinic.

Chaos, the subject of my speech this evening, became a very personal experience for us. And so, this night, I would like to honor three sets of people who, in microcosm, symbolize the efforts of the many who, then and since, have moved us from disorder to order:

- Dr. David Schiff, who proved one person could make a difference, represented by Professor Margot Herbert, the first perinatal social worker at The University of Alberta Hospitals.

- Paddi Koleyak McFadden, on behalf of parents and teachers, who have sought to improve the quality of life of survivors of dangerous beginnings.

- Cathy Morrison and Kelley Clark, on behalf of North American perinatal social workers, who have had more experiences with grief and joy than the majority of social workers ever experience.... and who brought us together in this room.

Taken together, the energy these strategic allies posses, connected across time, is formidable, and a grand force to counteract entropy.

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**"CHAOS"** — Where Brilliant Dreams are Born. Before the beginning of great brilliance, there must be Chaos. Before a brilliant person begins something great, they must look foolish to the crowd.

**I CHING IMAGE, Image #3**

**Let us be foolish together.**

As social workers, we have tried to be rational, to practice with wisdom instead of with mere practice wisdom. In our increasing search for predictability in an uncertain and turbulent world, in our search for guaranteed outputs and outcomes, we increasingly have adopted both the language and the strategies of management gurus. We have worshipped "total quality management and process re-engineering", solutions, which Margot Gibb-Clark of the Globe and Mail says were "being applied like quickie diets - with about as much lasting effect" (2 January 1993). While there have been, indeed, some successes in the short run, many of these "fads" have foundered because they were based on the assumption that the future would be a linear extension of the past. It is not so and we can't make it so.

Parenthetically, I would add that I am also concerned bout the de-layering, i.e., the disappearance of directors of hospital social work departments. As the co-founder of one out-placement service said, those thrown out are "the guts of the organization — the history, the corporate memory, the conscience and the succession line" (Howes, citing Evans).

As children we learned the dangers of cause and effect (sticking a bobby-pin in an electrical unit will light up your life); we learned its mysteries ("step on a crack, break your mother's back"); in high school we sat through physics classes with teachers who intoned Newton's laws like a mantra ("For every action there is an equal and opposite reaction"), a principle we tried to perfect, after school, in pool halls across North America.

Those of us who went into professions were especially seduced by determinism, because our own success in employing linear cause-and-effect thinking was so self-evident. We'd study, we'd work hard, we'd avoid the major temptations (if not the minor ones) of adolescent and young adult life, we'd graduate and get good jobs — real jobs — just like we always knew we would.

Sure, a few of our pals fell by the wayside, to our great surprise, but the "careless" pregnancy, the suicide, the concussion in the football game, the untimely death of someone's father, the 3 a.m. car accident, were all things that could be explained away, as random events or as due to some heretofore unknown, fatal flaw, in the character of the victim. We dismissed the randomness of these events and kept our cause-and-effect thinking in place, and when we couldn't locate the cause, we blamed God. We did not apprehend that these bits of disorder in our immediate world foretold things to come, so great in number, that we would be forced to consider disorder in the universe as a near and present danger, mystery, and opportunity. It is against this backdrop that we can begin to look at chains of events and of patterns, as social workers are accustomed to doing, but on a much wider screen than ever we imagined, and the projectionists are more likely to be physicists and mathematicians than psychologists and sociologists. Hence, the emerging science of chaos.

Determinism is not dead, nor should it be. It comes highly recommended as a technique for navigating pedestrian crosswalks, where the variables are few. Its usefulness in a dynamical system like social work practice is more limited, because the variables are so numerous, the direction of change is rarely linear, and time (as you know) can be counted in a heartbeat.

What could have been the triumph of determinism deserves a rather smaller celebration. Barry James, citing Augusto Forti, then-Assistant Secretary General of the United Nations/Vienna, states (International Herald Tribune. September 18, 1991), says that Newton and Galileo believed in the absolute supremacy of science and rationalism and left nothing for spirituality.

> "Their ideas have led us to the catastrophe of Marxism and brought us to the end of industrial civilization. Now we know the world is not a marvelous watch but part of an expanding universe. Things are no longer predictable."

Let us now turn to some of the basic concepts of chaos, for its peculiar language may be obscure and, in this instance, The Social Work Dictionary (Barker, 1991) is no help at all. There is no mention of chaos, much less of such terms as butterfly effects, Mandelbrot set, sensitive dependence on initial conditions, or fractals. Later, I will try to explain what implications these may have for your social work practice.

## LESSONS FROM CHAOS THEORY

Chaos is an informal term for a new field of research, sometimes called "non-linear science" or "dynamical systems" (Brennan 1992: 42-43). [It is also a term we use colloquially, as in "My job is total chaos right now".] In the main, chaos theory is being explored by physicists, mathematicians, biologists.... and a handful of social workers (for example, Chauncey A. Alexander, 1988). Ever vigilant for new themes, even the advertising industry has co-opted the word. Witness an advertisement for Four Seasons Hotels in a glossy magazine: ".... from chaos to comfort in mere moments" (City and Country Home).

We seem to have strayed a long way from Poincare's much less trivial observations, defined by him in 1892. Poincare, a French physicist, was the first to blow Newton's laws out of the water by observing that, stretched to three or more bodies, Newton's laws of mechanics failed to hold and that, instead, one got "the potential for non-linearity, for instability — for incipient chaos" (Briggs and Peat, 1989: 41). This is, I believe extremely important for social work practice: How many times do we ever have the luxury of dealing with only two linked variables? How often do we have the absolute necessity of dealing with three or more variables? dozens of variables? Working from a person(s)-in-environment perspective virtually guarantees that social workers must use theoretical models that seek to understand the nature of the world, models which explain the effects of non-linearity and the "breaking up of order into chaos and the more surprising emergence of order from chaos" (Greenberg, 1989). We know now, in fact, what we knew (only) intuitively before: a given input does not necessarily produce a proportional output; we live and work in complicated non-linear systems, and the unexpected is, or ought to be, the expected.

We used to think that, if "one knew all the variables… and one had a large enough computer to handle all these uncertainties, it would be possible to model, or describe in mathematical terms, any system no matter how complex" (Brennan, 1992: 43). Furthermore, we thought that we had "a perfect paradigm of law and order" and that, if we could only collect the proper data (input) we could ensure "a predetermined series of changes" (Cohen & Stewart, 1994: 189). We could string together a series of short-term predictions and, voila, an accumulation of these would become a long-term (accurate) prediction.

It is not appropriate, here, to wander through the history of what happened in the emerging science of chaos, from the time of Poincare's observation, slightly over 100 years ago (a history foreshortened by the fact that few comprehended until 1954 what he'd really said, according to Briggs and Peat).

Both "hard" scientists, and the scientists in social work, have been preoccupied with prediction, manageability, control, and the analysis of parts, thinking that if we could get the pieces down right, we

would understand the whole. We aimed for finding the regular patterns and smoothing-out or ignoring the irregularities, whether we were meteorologists trying to predict the weather, cardiologists trying to control ventricular fibrillation, economists on Black Monday in October, 1987 when the stock market collapsed, biologists trying to understand the cyclic nature of the rabbit population, or social workers attempting to help a dysfunctional family cope with an at-risk newborn. With the help of computers, we were forced to awaken ourselves to the irregularities. As University of California physicist, Bruce West and Ary Goldberger of Harvard Medical School declared in the American Scientist (Briggs & Peat, 1989:14):

> Many biological systems, and many physical ones, are discontinuous, inhomogeneous, and irregular. The variable complicated structure and behavior of living systems seems as likely to be verging on chaos as converging on some regular pattern.

Briggs & Peat (1984:14-15) urge us to construct "a new mirror to hold up to nature: a turbulent mirror", so that we will "see how in the landscape on one side of that mirror ... the ways in which order falls apart into chaos; how on the other side… chaos makes order; and how at the mirror's elusive surface — at the nexus between these worlds… " we can shift attention from a system's quantitative properties to its qualitative ones. This is a long way of saying that we can no longer use our reductionist strategies to study parts in isolation from wholes, that there is a peculiar kind of harmony between order and chaos, and that change is at the heart of both evolution and revolution. Adapted for this audience, one could say that it will matter a great deal to you, as perinatal social workers, working in and with complex dynamical systems, that you take into account the chaos in the whole system of health care. How might you want to accelerate, amplify, or dampen-down the never-ending cycles of order-to-disorder to order? To intervene in a cycle, even minimally, is as big a decision as to let a cycle run its course… but then, of course, you would have to live with the effects of the interventions by, and the bifurcations caused, by others! One can postulate that we have ignored turbulence and chaos, or endured it, thinking somehow if we took it into account, we were encouraging it to stick around. [This is called "denial", in other quarters.] Well, the good news is that, like regularity, chaos has its parameters, too. To go back to the colloquial example, your life may be chaotic and you can't locate your socks, but there are a limited number of places you will look for them: under the bed, in the wash hamper, etc. It is unlikely you would seek or find them in the microwave. That is contained randomness.

**Lessons to be Learned**

There are many things we have learned from staring into and floating through the turbulent mirror. In the interests of time . . . and digestion and Danny Hooper ... I will deal with but one, ce soir.

This is "the butterfly affect", or "the sensitive dependence on initial conditions". Remember Newton's adage that for every action there was an equal and opposite reaction? Wrong. Time was, i.e., until about 25 years ago, that we thought that with the advent of supercomputers we would be able to enter all the variables and "it would be possible to model, or describe in mathematical terms, any system, no matter how complex" (Brennan, 1992:43), and we would be able to forecast/predict weather patterns, for example. That weather was inherently chaotic was demonstrated by MIT meteorologist Edward Lorenz, who discovered "that models of chaotic systems have an exquisitely sensitive dependence on initial conditions and minute but unpredictable variables" (Brennan, ibid). This phenomenon was called Butterfly Effect by Lorenz at a 1970 lecture "when he posed the intriguing question, “Could the delicate motions of a butterfly deep in the Amazon forest spawn a tornado over Texas?" (Brennan, 1992: 43). YES.

Even Czechoslovakian President Vaclav Havel, speaking at the 1992 World Economic Forum in Davos, Switzerland, said:

> You have certainly heard of the "butterfly effect." It is a belief that everything in the world is so mysteriously and comprehensively inter-connected that a slight, seemingly insignificant wave of a butterfly's wing in a single spot on this planet can unleash a typhoon thousands of miles away.

As we say in social work, everything is connected to everything else.

What is being described here is the move from simplicity to complexity, and complexity has its own laws, which we do not understand at all well … yet. But it does help with some things ... it does make me comfortable with rejecting outright the linearity of trickle-down economic theories … and I will never again say, or believe; "What goes up, must come down." and, because I can never know all the sensitive initial conditions, I will not know the probabilities of the interest rates on July 1st when I have to renew my mortgage ... or, until then, what I should wear for the weather conditions. There are, however, consequences of our freedom, especially of our freedom to think. One can find a peculiar comfort in facing chaos, searching for its patterns, and working in partnership fashion with colleagues who are intrigued rather than frightened. There is also a comfort in knowing, as I said at the beginning of this evening, that one person can make a difference, that one can be one of those sensitive initial conditions. Each of you can be a butterfly.

Back to Vaclav Havel (1992):

> The world … has something like a spirit or soul … something more than a mere body of information that can be externally grasped and objectified and mechanically assembled. Yet his does not mean we have no access to it. Figuratively speaking, the human spirit is made from the same material as the spirit of the world. Man is not just an observer, a spectator, an analyst, or a manager of the world. Man is part of the world and his spirit is part of the spirit of the world … only those who are looking for a technical trick … need feel despair. But those who believe, in all modesty (and I hold you among them), in the mysterious power of their own human Being, which mediates between them and the mysterious power of the world's Being, have no reason to despair at all.

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