

# **The Chaos Theory of Careers: Theory, Practice and Process.**

Professor Robert G.L. Pryor  
School of Education, Australian Catholic University

And

Professor Jim E.H. Bright  
School of Education, Australian Catholic University

The Chaos Theory of Careers (CTC) was developed at the turn of the Millenium to address complexity, change and chance in career development. Extant theories of careers had largely ignored these factors or merely acknowledged their presence with scant insight into their operation, organization and opportunities they present. Almost all other theories of career development start from the premise that we can in principle map out all of the systems of influence bearing upon an individual and thus they emphasize predictability and stability. However, the CTC proceeds from the premise that stability and instability are inherent properties of the world and that emerging stable orders must be considered in relation to instability and uncertainty. The CTC employs the idea of Attractors that provide a useful way for the counselor to conceptualise the career-related thoughts and behavior of their clients.

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### **Development of the Chaos Theory of Careers**

The Chaos Theory of Careers (CTC) derived initially from discontent with the types of career development theory that were extant at the end of the twentieth century. Such theories although identifying useful aspects of career development had the deficiencies of being partial in explanation, narrowness in focus as a general rule and were limited in their applicability to both research confirmation and even more importantly, counseling practice. We were seeking a new approach to theory and eventually it came to be appreciated that such an innovation could only occur with a change of paradigm about how science is undertaken, how concepts are formulated, how research is conducted and how theoretical ideas are translated into career counseling.

It was obvious to many writers (e.g. Neault, 2003) that the nature, context and demands of working for the twenty-first century had changed substantively and irrevocably from older paradigms which focused predominantly on an upward trajectory single career for life. Some of the “new realities” for twenty-first century work are:

- Speed of communication
- Reshaping of organizations
- Speed and extent of change
- Need for lifelong learning
- Globalization of both consumer markets and labor markets
- Increasingly contractual nature of work
- Rapidity of technological innovation and its adoption.

Such changes present new challenges to those entering the workforce, those in the workforce and the counselors attempting to assist them. How can we understand such challenges such as uncertainty, change and chance and find ways to negotiate and utilize them effectively. We believe that chaos theory is a possible theoretical framework which can provide a map of this new territory and help us to see where the “counseling dead-ends” might be and where to look for and locate new opportunities for assisting individuals’ career development.

### **An Outline of the Chaos Theory of Careers (CTC)**

Chaos theory has been described as “the third revolution” in twentieth century science – the other two being relativity and quantum mechanics ( ). Peat (2000) charts the movement of most spheres of science in the twentieth century away from hubris and certainty to humility and uncertainty. What twentieth century science discovered is that reality is far more complicated than anybody originally imagined (Green, ).

Chaos theory across many disciplines of not only science but other fields of human endeavor such as economics, politics, aesthetics and religion, emerged as a new approach incorporating complexity, chance, non-linearity and emergence in a systems theory formulation. We took the view that if chaos theory was applicable to all phenomena in the universe then it must be applicable to human behavior and specifically to career development. Chaos theory has been incorporated into various domains of psychology (Butz ).

Fundamentally chaos theory is an attempt to give a scientific account (often in terms of mathematics) of two fundamental principles of nature: self-organisation and change.

Without self-organization there would be no universe ( ) since after the Big Bang all components released would have otherwise simply enfolded back in on one another. Self-organization is the process of building structures that allow life to develop. Change is the process by which such structures survive and evolve. The ultimate result of operation of these two principles through emergence (an interactive effect of the operation of self-organizing and change) is the increasing complexity and diversity of the universe (Morowitz, 2003).

With the emergence of life and subsequently human life, we specifically have the development of complex dynamical systems. A system is simply a combination of specific components which combine to act as a single entity. All of us familiar with many different types of systems – natural (river systems), cultural (political systems), information (the Internet), economic (banks) and physiological (autonomic nervous system) and so on. However in characterizing systems as “complex” and “dynamical” what chaos theory does is draw attention to both the implicit nature of the such systems and the explicit way in which they behave or function. As Lorenz (1993), one of the pioneers of chaos theory, observes the essence of chaotic systems is that they are sensitive to changes in initial conditions. This is the inevitable result of such systems being complex and open to influence from other conditions. As systems become more complex they incorporate more components, develop more connections within the

systems and are exposed at more points to influence from other systems. The development of the Internet can be seen as an example of this process. From being limited to military intelligence exchanges of information it has developed into the foundation of a substantial proportion of human communication. In the process its uses and applications have expanded exponentially in the space of a comparatively short period of time and its complexity has as a result exploded and so too has its vulnerability to abuse by hackers, viruses, spammers, terrorists and so on.

The Chaos Theory of Careers (CTC) conceptualizes each person as a complex dynamical system. All of us are composed of complexity in terms of our minds, bodies, social networks, past history and all the other influences frequently delineated in the textbooks on career development and decision making. Such intrinsic complexity is the context in which we live our lives and develop our careers. One of the great challenges therefore of ongoing career development counseling to help individuals accept the realities of complexity, interconnection and change and to develop ways to use them constructively as individuals strive for meaning, purpose and fulfillment in their lives.

One of the most useful aspects of chaos theory is that it not only is able to incorporate many of the changed realities of modern work, it also provides descriptive accounts of how systems function which suggest exciting new ways to understand people's careers and to suggest new strategies for assisting them. These accounts are called "attractors".

### **Attractors**

Chaos theorists have identified that complex dynamical systems function in characteristic ways. These are called the attractors. Attractors are characteristic trajectories that systems develop as they function as systems interacting with both their internal components and the external environment. Electromagnetism is a common example of “attraction” in which an electrically charged object exerts an influence on another object containing an opposing charge. Attractors can also be understood as feedback mechanism within a system to promote both stability (negative feedback) and change (positive feedback) at the same time.

Chaos theorists have identified four characteristic attractors although only the last one (the strange attractor) is distinctively associated with complex dynamical systems.

1. Point Attractor – the pattern of this attractor is that the system as a whole is drawn to a particular point. Water going down a sink’s plug hole is functioning according this pattern as is a river running to the sea. Death for example, could be considered as life’s goal attractor – despite all our efforts it is the inexorable state to which we are all eventually drawn. In the career counseling context, the goal attractor manifests in clients in various ways such as most forms of obsessive behavior, “tunnel vision” (seeing only one possible career option), preoccupation with a single goal, overconfidence in one’s ability to overcome any career obstacle, fixated thinking and inheriting a career without consideration of any other possibilities.

Counselors too can be dominated by point attractor thinking. For example, they may interact with clients in goal attractor ways by inappropriately foisting decision making paradigms onto clients such as extreme rationality in decision making. The most obvious example, is the counselor assuming the individualist paradigm of most Western countries culture when working with those with more cooperative and communal aspirations of those from many non-European or indigenous backgrounds.

2. Pendulum Attractor – the pattern of a system’s functioning which is dominated by two competing sources of attraction. For example, we are all aware of the effects of gravity - on earth we never fall upwards, it always downwards. However why is it we never get simply sucked into the centre of the earth? The reason is that there is a competing force with gravity – electromagnetism. This force holds the atoms of objects together and is stronger than gravity. As a consequence gravity keeps us on the surface of the earth and electromagnetic keeps us from being drawn through the surface to Earth’s centre. Thus it is our everyday experience of competing attractor influences on us.

However, with the pendulum attractor there are competing sources of attraction which cause systems not simply to cancel each other out but rather to function in a swinging motion from one attraction source to the other. An example of the pendulum attractor that most students of psychology come across in learning theory is the “approach avoidance” conflict in which one option is attractive when far away and becomes less attractive as one approaches it while in turn, this results in another option previously less

attractive becoming more attractive as it is moved away from. In career counseling terms we can identify such a pattern in the functioning of stressed clients who are likely to adopt dichotomous thinking strategies - everything is black or white, perfect or useless, desirable or repulsive, ecstatic or horrific. Such thinking is extreme in content and typically oversimplified in structure. Only two competing influences are contemplated and the only choice option is one at the expense of the other. Work-family role conflict can be understood in these terms. The demands of each role can be competing and sometimes people will see answers exclusively in terms of being a worker or being a parent. Of course both are legitimate choices, however the challenge is to develop more creative and nuanced strategies to explore the possibilities of balance and adaptation and change for each individual seeking to reconcile work and family responsibilities.

3. Torus Attractor - the point and pendulum attractors typically seek to function as systems by simplifying sources of attraction. However the torus attractor acknowledges the reality of multiple sources of attraction within a system. This attractor is characterized by functioning complexly on the one hand and routinely on the other. Individuals dominated by the torus attractor are those who want to organize everything down to the finest details. Their motto is "a place for everything and everything in its place". They like schedules, routines and pigeon holes for ideas and people; they set up systems and have regular places and times to do things. Much of the internal energy in such systems is devoted to resisting change. Such individuals may also be constrained by tradition and conformity to the extent that they relinquish the right and responsibility of individual decision making of any real consequence. For some counseling clients the power of the predictable repeating pattern of the torus attractor results in them making the



same mistakes over and over again such as reverting to addictions or abusive relationships (Briggs & Peat, 1999).

Those functioning in the torus attractor often do so because they are afraid to confront change. As a result their quest for control actually demonstrated their own insecurity and underlying feelings of vulnerability. They try to organize complexity in order to control it and often they accomplish a great deal by adopting this strategy. Organization and persistence can result in substantial achievement and this is why we believe this is the most inveigling of all the attractors. It has the appearance of dealing with the implications of complexity but in reality the torus attractor is an attempt, either conscious or unconscious, to deny them by the illusion of ultimate control and the quest for predictability and certainty.

### **Some Counseling Implications of Closed Thinking Attractors**

These three attractors outlined above represent forms of closed systems thinking. Although they may have particular functional advantages they also have two fundamental weaknesses. These weaknesses are the foci for effective career counseling. The two fundamental problems that closed systems attractors pose are the expectation that all information about a situation can be known and that individuals are able to control both themselves and the consequences of their decisions. Both expectations are beguiling because individuals can usually find examples in their experience of times when one or more of these closed systems attractors was effective in solving a problems.

For example, most of us have had the experience of setting a goal and achieving it (point attractor), of finding a reconciling strategy between two options about which we were ambivalent; of having developed a system to organise information or a task efficiently. As a result of selective attention on one hand and reinforced learning on the other, it is not uncommon for individuals to try to apply one of three attractor strategies to many if not all the subsequent challenges they confront including those associated with career development.

Consequently career counselors will sometimes have clients who can be identified with a history of point attractor thinking and who will seek by focus of attention, sacrificial commitment, personal discipline and sheer will, to deal with complexity and change through goal achievement strategies. Indeed it not uncommon for some counselors to adopt this as their dominant counseling strategy, that is, the goal of the “perfect career”. The two biggest problems with goal setting strategies is that they overestimate what can be controlled and they can involve high levels of ego involvement which some individuals subsequently very difficult to set aside. Of course individuals can and should be encouraged to take responsibility for their actions and reactions. However, there are still many other influences on our career development over which we have little or no control. On occasions these will thwart even the most ardent, sacrificial, single-minded goal setter. For example, the athlete aspirant who because of a niggling injury from a training accident, despite all her efforts never quite achieves success at the highest levels of competition in her chosen sport. Repeatedly trying hard, training more frequently and

focusing more intensely, ultimately only increases her frustration as she realizes the limits of her control and the ultimate inadequacy of point attractor functioning.

Pendulum attractor functioning similarly can be effective on occasions by dealing with complexity using strategies of divided effort and role balancing. However, individuals do not have sufficient control over the effort costs of such approaches nor over the potential changes in the two dominant influences on their functioning, to be always able to ensure satisfactory outcomes. The effects of complexity ultimately intrude on all closed systems thinking approaches to undermine them.

In addition torus attractor functioning endeavors to control complexity by utilizing procedures and efficiency. The problem is that even the most thorough organization and the most comprehensive systems, will never totally control all the potential influences on career development. Numerous popular films deal with this theme such as “Jurassic Park” and “I, Robot” in which despite the best human attempts at the control of complexity still produces unpredictable outcomes with the potential to undermine all our organizational efforts.

The fallacies of all closed systems attractors are:

- All outcomes are predictable
- Life should be fair
- The unexpected should not and will not happen
- The way things have been is the way they will be

- Humans are in control
- The exceptional is an aberration that can be disregarded.

In summary, while the three closed systems attractors represent partially effective ways to negotiate the challenges of career development, their common weakness is their disregard of contingency. Indeed it is the contingent nature of all reality that gave rise to the most distinct aspects of chaos theory in the first place. In particular, chaos theorists identified an additional attractor in which contingency, change, complexity and chance were as important and influential to the attractor's functioning as the structural influences of stability. This attractor became known as the "strange attractor".

4. Strange Attractor – is the functioning of systems in terms of both stability and instability at the same time. For strange attractors stable patterns of movement or functioning are discernible over time, however the repetition of functioning is never exactly the same over time.

## **What Contributions could the Chaos Theory of Careers make to our understanding of career development?**

- **Reconciles Being and Becoming**

Since the time of Plato most explanations of reality have focused predominantly on either structure (being) or process (becoming). However, conceptualizing structural accounts that incorporate processes of change, adaptation and transformation has proved very difficult. Holland's theory of careers provides an obvious example and the endeavors of Person-Fit theorists by reference to intervening variables is far from convincing. Chaos theory's emphasis on complex interactions of multiple variables resulting in emergence of new structures and transformations as phase shifts (sometimes called "tipping points") provides the framework for elucidating how structures may be resilient, adapt, change or transform as part of the way that complex dynamical systems operate.

- **Points to the need for different perspectives**

By acknowledging the limitations of any one perspective for looking at and understanding a situation or phenomena, the Chaos Theory of Careers promotes the need for difficult problems to be approached from different perspectives. The current development and use of metaphor in career development and counseling (Amundson Inkson, 2007) is an acknowledgement of the efficacy of multiple perspective problem solving. What the Chaos Theory of Careers is to provide a theoretical rationale for such an approach in terms of complexity and change.

- **Provides a coherent understanding of chance**

Various writers have indicated the place that chance, serendipity, luck and unpredictability has in career development. However, while in general career development theorists acknowledge the role of chance by adding for example, to lists or diagrams of factors or influences on career development, no existing theory gives a coherent rationale for how chance can be integrated into the general process. Even though “planned happenstance” is sometimes presented as a theory in effect it is a series of research data and practical ideas about how to use chance positively in career decision making. While this is helpful it is not an rationale for including chance into larger formulations of career development.

However, the Chaos Theory of Careers conceptualizes unpredictability as the inevitable consequence of complexity. The more complex a system is in its operation and the more open it is to other complex systems, the greater the likelihood that unpredictable events will occur. This one of the reasons why the weather in most parts of the world is so difficult to predict with certainty for any substantial long-range period. There are simply too many variables interacting in too many different ways for even the best of our computer models to be able to predict confidently what the weather would be like with anything other than a probability estimate. Such limitations are not simply a consequence of our limited instrumentation or the number of observations we have been able to make. Traditional positive science claimed to be able in principle at least to be able to predict all phenomena. Chaos theorists believe this to be inherently incorrect since all knowledge is approximate and incomplete. The consequence of this is that a non-linear (“Butterfly

Effect”) change is therefore a perpetual possibility thereby rendering uncertainty a perpetual and intrinsic quality of human’s knowledge of the universe and even ourselves.

- **Links Science and Spirituality**

In the last 15 years or so there has been renewed interest in the role of spirituality in career development. Individuals have begun to redefine what career success might be and to seek to integrate work into broader sources of values, meanings, life purposes and world views. Constructivist thinkers such as Savickas ( ) have drawn attention to changes in perspective from “living to work” to “working to live” such that work is made subservient to and a contributor to goals of personal meaning and fulfillment. With the idea of the boundedness of the fractal the Chaos Theory of Careers provides a theoretical framework for linking spirituality to employment. The fractal is the picture or description of the functioning of a complex dynamical system. Such systems self-organize by differentiating themselves from other systems, for example, in a small child’s gradual development of a sense of self as independent from the world, her parents, the family dog and eventually all other people. Ultimately in a psychological sense this boundary can be explored by discovering what it is the person is willing or unwilling to do, what they believe good and bad, what they think is valuable or worthless, what they aspire to and what they are indifferent about. These notions are ultimately the spiritual dimension limits of their lives. They influence and often govern the shape of the fractal and therefore the way the whole system operates. A belief in God has the potential to impact greatly on the way the person as a system operates – sometimes constructively and sometimes destructively.

Such a conceptualization also provides an understanding of how conversion and trauma can impact on career development – again arenas largely untouched by most career development theorists. Such changes are manifestations of the phase shift of a system which reaches its tipping point for whatever reason. This too is another form of unpredictability that extant theories of career development have difficulty coming to terms with.

- **Non-linearity as a key to personal change**

The CTC's emphasis on non-linearity is a cause for hope and opportunity for counselors. If small changes have the potential in complex dynamical systems to produce far reaching effects and even phase shifts, then counselors should be encouraged to address even the most intractable of clients problems. By seeking what it is that brings meaning, purpose, joy and worth to their clients they can begin to use this as a foundation for client motivation to change.

- **Moving from prediction to pattern recognition**

Chaos theory's idea of "emergence" reformulates the practice of career counseling away from a focus on analysis and prediction toward pattern identification and insight. The CTC implies that it is foundational for counseling to look for the interconnections in client's life, experience, aspirations and thinking. Such investigation leads to the identification of patterns sometimes referred to as metaphors. (Inkinson, 2004 Amundson .....). these exemplify the characteristic functioning of the person as a complex dynamical system and are key to gaining insight into an individuals' need for stability and potential for change;



- **Humility and limitation as parameters of counseling**

Chaos theory introduces humility and limitation into the counseling context. All parties to involved in counseling have expertise but there are no gurus – neither counselor or counselor. Complexity ultimately befuddles us all. Certitude is a property career counseling does not and will never have. We all have to work within our limitations of knowledge and control. This does not mean that counselors cannot help their clients to make plans, organize resources, implement choices, create opportunities, set and pursue courses of action. However, it does mean that such strategies need to be created and pursued in the constant knowledge of uncertainty and change. Therefore strategies are likely to require regular monitoring, evaluation and possible revision rather than just wound up and let run. Chaos counselors always recognize firstly, that they do not have all the answers that their clients usually want; secondly that they can be mistaken or undermined by the chaotic complexity of reality; thirdly, that all decisions may have unintended consequences; fourthly, that decision making in the context of change, must be continuous and creative (Briggs & Peat, 1999);

- **The limitations of plans and actions**

Formulating, committing to and pursuing goals has often been seen as a major component of career counseling (Greenhaus, Callanan & Godschalk, 2000). Chaos theory suggests that such an approach may be effective in the short term but in the longer term goal setting tends to fail.

In order to sustain formulated goals over a significant period of time requires the linkage of such goals to ideals, purposes, commitment, or sources of meaning and inspiration

beyond the individual (Pryor & Bright, 2004). Without some form of spiritual foundation, goal setting behavior will be unlikely to effect sustained positive change in the thinking and behavior of individuals;

According to the Chaos Theory of Careers (CTC) the essence of career counseling is to:

- a) identify where operative clients' closed system thinking strategies
- b) help clients to realize that such efforts at control, certainty, knowledge and predictability are crucially limited.
- c) assist clients to recognize and utilize the stabilities and surprises of living in the Strange Attractor
- d) Enable people to be able to both perceive the dimensions of complexity and to be able to be to acknowledge and effectively negotiate uncertainty, change and chance in constructive ways to fulfill their deepest aspirations.

- **The need for a broad focus in career counseling**

Chaos theory's emphasis on complexity and connectedness draws counseling attention to the need for a broader contextual understanding of career development issues. Issues of culture, social disadvantage and work-family balance are readily acknowledged, even if not so readily resolved. However, influences such as elder care, the media, transport, technology and past emotional trauma, to name but a few, may also constitute defining characteristics of the person's attractor and may also need to be taken into consideration in career counseling. One of the strategies that career counselors frequently adopt is to explore the most common potential influences on individuals' career development such

as educational history and employment experience. However, a focus that is too narrow and superficial may miss the apparently less significant and less common influence that may be impacting non-linearly on the whole of the rest of the person's functioning. This in turn may be the key to motivating the "stuck" client who otherwise cannot see any further career options worth pursuing (Amundson, 2003).

For too long our scientific framework has led us to simplify, analyze, experiment and predict. As a result often our theories, research and practice in career development has reflected these same approaches. In the process we have learnt much of value but we have also neglected other things at least as vital. The future directions of science in general and career development in particular no longer exclusively lie in the reductionist direction. The reality of complexity and its results we cannot continue to ignore. Increasingly we will have to look at non-linearity of change, at networks as foundations of systems and address the human realities of change, chance and uncertainty. Chaos theory provides a conceptual infrastructure through which we can begin to confront constructively such realities and to point to promising new directions to help and support individuals struggling with these challenges. The Chaos Theory of Careers also suggests new directions for career counselors and suggests new opportunities to negotiate change and chance optimistically and proactively.

