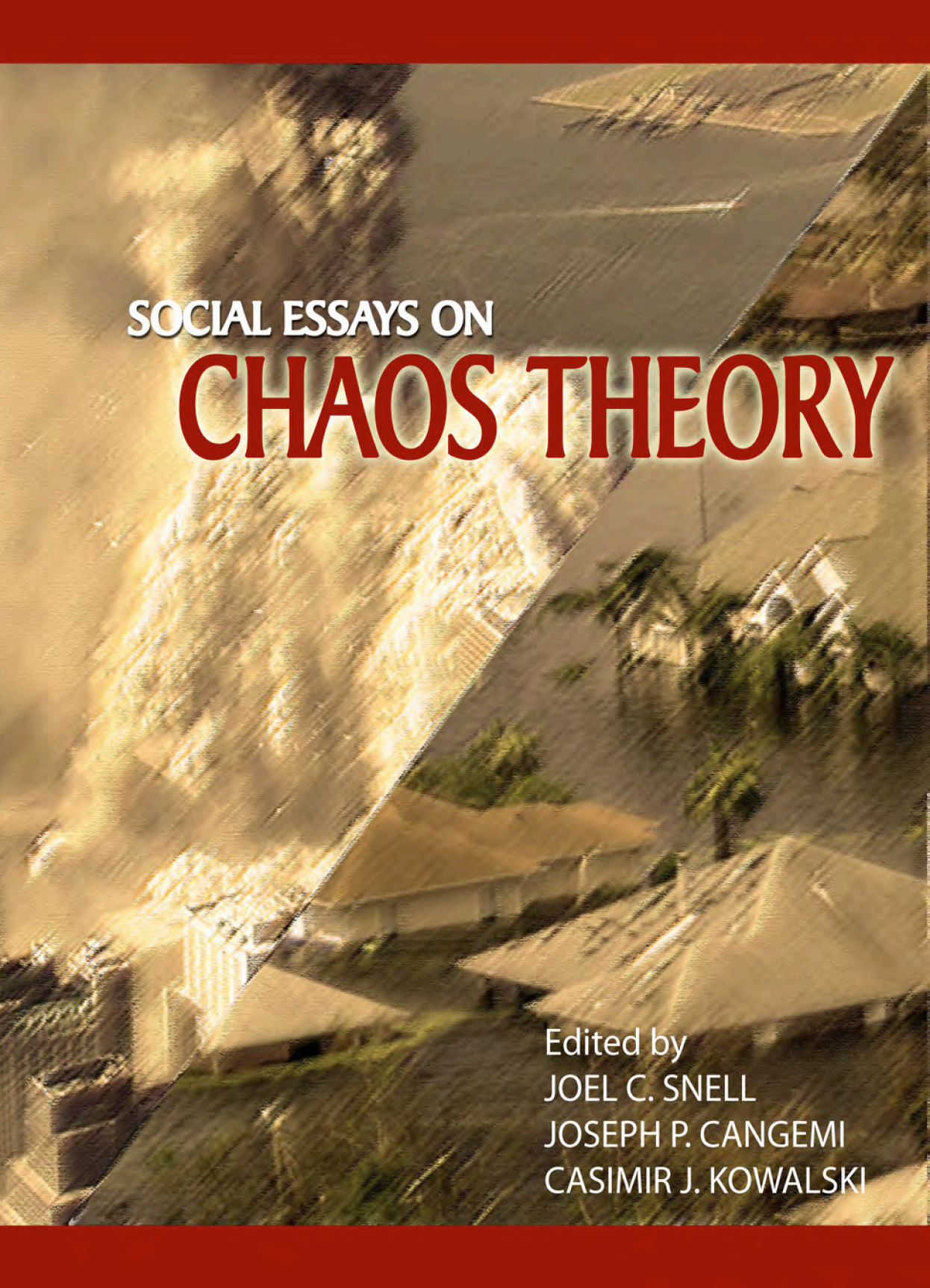
SOCIAL ESSAYS ON
CHAOS THEORY
Edited by
JOEL C. SNELL
JOSEPH P. CANGEMI
CASIMIR J. KOWALSKI

Social Essays on Chaos Theory

Joel C. Snell
Kirkwood College
Cedar Rapids, Iowa

Joseph P. Cangemi
Western Kentucky University
Bowling Green, Kentucky

Casimir J. Kowalski
South Carolina State University
Orangeburg, South Carolina

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To Our Spouses, Children, Family, Friends, and Colleagues

FOREWORD

During my professional working experience I served as a Captain in the U.S. Air Force, but I returned to civilian life after six years to manage the Safety Program and Occupational Safety and Health Act compliance for a major chemical production complex; later, I was a Human Resource Manager at an electronics manufacturing plant, and then I went on to Kennedy Space Center to take a position as Senior Internal Auditor. During course work for my Master's Degree in Management of Technology at the University of Miami, I was introduced to the chaos theory. I was fascinated at the paradox that there was some "order in chaos". My work experience included a great deal of planning, and I must admit some of the best-laid plans did not always produce the intended reality. Random factors caused unplanned results. A Prussian Field Marshal, Helmuth von Multke said, "No plan survives contact with the enemy." That is the reason, unlike Napoleon, he gave his subordinate officers the liberty to make on-the-spot battle decisions. However, we still find very many instances where luck played a huge part in the outcome.

The authors of this new book on chaos theory attempt to describe how it might work and its applications to the macro, mid-range, and micro theories of human behavior.

As they note, the meaning model, conflict model, and equilibrium model all are imbedded in the fields of social sciences and in business. Additionally, they maintain that chaos theory does not stand alone. It complements the three major theories.

Chaos theory's major feature is to try to explain unintended consequences that emerge continually in life. Further, in spite of the outward disarray of reality, order appears to be at the base of the movement of life. Therefore it seems we can accept Albert Einstein's observation that, "God does not play dice with the universe."

The authors suggest that although the book is not long, it is best to read it over a period of time rather than in one sitting.

I hope that this book becomes of value to you in your future endeavors.

R. John Povilaitis
Senior Internal Auditor
United Space Alliance
Cape Canaveral, Florida

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ORIGINS OF CHAOS THEORY

Joel C. Snell

Mitchell Feigenbaum is not a household name. He was a consultant to the Los Alamos National Laboratory. He was known to think deeply and abstractly. Often, he would pace through the night. At the time, in 1974, he was on his way stumbling and tumbling intellectually onto chaos theory. He is considered the founder. The number 4.669, a scaling factor, underscored a universality of math functions.

At the time, chaos theory was outside the paradigm of classical science. If anything, the general chaos ignored by math, biology, chemistry and physics gave rise to chaos theory. It is the study of disorder and the order that is within it, around it, and below it. The "it" has no name, and "it" has fascinated mystics for generations.

In the early '60s, Edward Lorenz discovered that returning to a sequence of numbers and starting in the middle of a printout would gradually cause enormous effects on simulated computer wind patterns. Further, one tiny fractional change would create enormously different outcomes. Thus, there was a metaphor. One tiny butterfly flapping its wings could cause life threatening weather storms thousands of miles away. "It" is called the "butterfly effect" (www.mhd.com/grae/chabs/ html*)*.

James Gleick traced the beginnings of chaos theory in his *Chaos: Making A New Science* (1987). We discover through the author that reality is observed and categorized through non-linear science, geometry of nature, strange attractors and related.

By 1977, Louis Halle was describing chaos theory to social scientists. One of the authors of this book (Joel Snell) reviewed Halle's book *Out Of Chaos* (1977).

According to Halle, the bottom of things is chaos (or it appears to be), and then there is an ascending level of randomness, indeterminacy, and uncertainty. All of this builds to…order. Halle also suggested, given the proper distance, both society and the individual have meaning.

Halle was most impressed with individuals who contributed to the micro-triggers; they have a new viable idea, invention, sonnet, or theory. Additionally, they do this in spite of all the confusion (chaos) going on around them.

He concludes with the meshing and interfacing of mysticism and science. In other words, chaos gives rise to a grander scheme of order.

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EXPLAINING CHAOS THEORY

Joel C. Snell

Introduction

In this book of essays, we want to clarify some issues relative to chaos (and complementary theories: Catastrophic Chaos and Topological Chaos).

Chaos Theory (Order Within Disorder)

Chaos Theory describes reality that appears to the observer to be messy, disorderly, and complicated. Behavior is described in terms of fractals, phase portraits, attractors, and bifurcations. However, beneath and from above, this order appears to have an order to it. In common parlance, life goes on.

Catastrophic Chaos Theory (Revolutionary Change)

This theory attempts to explain how at certain strategic times explosive behavior (revolutions, riots, and dramatic social change) occur. A catastrophic fold explains behavior. Thus, a constraint or an imbalance in the lives of humans festers and antagonizes to the point that revolutionary or major reformist change occurs. There appears to be a "tipping point".

Topological Chaos Theory (Evolutionary Change)

How is it that gradual, evolutionary change occurs to the point where, both within ourselves and external to ourselves, we may modify our attitudes and actions? Or we may experience dramatic evolutionary change in subtle day-to-day thought and action. A Mobius band is used as an illustration.

Observations

1. As much as the writers are interested in this area and want these theories to prosper in academia and in the wider world, we do not believe that this is the final word on human behavior. Ideally, science is ongoing and self-corrective. This also applies to the theories that we have discussed.

2. Additionally these theories may contest as well as complement the three major theories found in the social sciences and related fields: the equilibrium model, the conflict model, and the meaning model. We believe that these models or theories are still very helpful and will continue under various labels in numerous fields. We do not believe that these new theories will replace the established models.

3. We will raise questions about the prevailing order either beyond or beneath social disarray that is assumed in *Chaos Theory*. There may be, at times, below disorder is disorder; or the disorder may really be order of another dimension not knowable to the senses of all, or most, of us. This area is outside our experience. It is a theological question. In the natural and social world a vacuum appears to be quickly filled with some other phenomena of change. Thus, order appears to prevail.

4. We do not want to assume that the illusive order we are discussing is always desirable. We will allude to observations by Joseph Cangemi relative to some Third World countries. If the order is desirable, who perceives this as valuable? Who benefits? There are some outwardly appearing "orderly" countries, in which people do not want to dwell. The outward "order" comes at a price of numerous liberties. Outwardly, there are countries with *seemingly* few "social problems" because, whatever the unacceptable behavior deemed so by the ruling elite may not be defined as a social problem because the offenders are eliminated, incarcerated, or deported. Further, the press is muzzled and the problems are not discussed in daily public discourse in the countries just described.

5. *Chaos Theory* has been linked to such terms as bionomics (a form of laissez-faire capitalism) or the new Marxism, post modernism, feminism, the new socialism (a form of capitalism) or numerous other topics. We do not want to make those links. However, we are

not opposed to others doing so. In the larger scheme of things, social thought intertwines, intermixes, synthesizes, destroys, resurrects and rearranges new components of past ideas. We want the reader to know we believe that *Chaos Theory* and its derivatives have practical and useful applications, but the further linkage we also will leave to the others.

Conclusion

Chaos Theory is another explanation of how humans create social order. One of the theories, *chaos,* explains the overall process of how behavior emerges and changes; *Catastrophic Theory* describes rapid change and *Topological Theory* portrays gradual change. The rest of the article deals with caveats by the authors relative to these theories and their relationship to other social thought.

THE NEW SCIENCE: CHAOS THEORY, CATASTROPHIC THEORY, AND TOPOLOGICAL THEORY

Joel C. Snell, Joseph P. Cangemi, Claire Noble, Kay Payne, and Casimir Kowalski

Postmodern theory suggests human behavior is more sporadic, less orderly, and less rational than previously thought. It complements, but does not replace modernistic theories based on equilibrium, meaning, and conflict. Postmodern theories include Chaos, Topological and Catastrophic theories. *Chaos* deals with the outwardly appearing non-orderly behavior and change of humans that essentially has an order not directly observed. *Topological Theory* deals with gradual human change, and *Catastrophic Theory* deals with rapid social change. The article purports to explain these theories.

The authors will attempt to explain three relatively "new" theories. They will borrow heavily from Dragan Milovanovic's *Postmodern Criminology: Mapping the Terrain* (1996).

Background

Many of the social sciences have honored behavioral models easy to quantify (Keil & Elliot, 1996). Applying hard numbers to behavior has been questioned by many academics that believe that "relationships are more important than counting things" (substance over relations) (Emirbayer, 1997).

One of the most popular theories is systems theory (Cangemi & Payne, 1999). It is an equilibrium model found in sociology, political science, economics, communications and related fields. The model sees stability and balance over time but has trouble documenting ambiguity.

Thus, *Chaos Theory* emerged roughly twenty years ago. As Wilson (1998) noted "…the theory was born in the 1970's, gathers momentum in the 1980's and was enveloped in controversy by the mid-1990's. The issues of contention are almost as tangled as the systems the theorist hoped to unravel…many have not heard of it."

Hall (1991) suggested *Chaos Theory* is related to the science of disorder. Brown (1995) indicated it is the study of irregularity. Kellert (1993) noted it is the study of the unpredictable. Referring to the systems theory, Wheatley (1992) implied it is the study of chaos of disequilibria that allows for change.

Thus, the field is about relationships that are ambiguous and perhaps not familiar to many.

Milovanovic

According to Milovanovic (1996), "when there is some thing in the equilibrium model or functionalist model that one cannot count, it is considered "noise" or extraneous. However, little unnoticed and uncounted behavior can, over time, bring chaos to a system; and balance must be

restored. In other words, there is order in disorder. Three theories (Chaos, Catastrophic, and Topological) attempt to look at that which may be overlooked by the equilibrium model. Parenthetically, these observations also may apply to the conflict and interactionist theories known by sociologists, but called by other names in other fields. However, it is important here to remain with the equilibrium model because it is so well known to so many, especially in the academic community.

Chaos Theory

Chaos Theory attempts to explain how disorder (chaos) at the micro level gives rise to order and change at the macro level. Order in the equilibrium model is sometimes labeled the order of relationships or structure, and the change in relationships over time is called function.

Terms

The following is a brief explanation.

- Relationships or *behavior* not easily measured (or non-linear) are called a *fractal* (a chaotic unit of behavior).
- *Fractals* are likely to be *non-linear*.
- *Non-linear* behavior at times "settles down" so that it can be measured. This momentary stop is called a *phase portrait*.
- A *phase portrait* comes together and settles down because of *attractors*.
- *Attractors* direct behavior to a region where it is observed, monitored and ultimately measured. *Cyclic* attractors create or encounter limitations to form boundaries. *Torus* attractors cause drag so there is stoppage or they slow down behavior until it stops. *Strange* attractors enhance dynamism or facilitate energy so that behavior can start up or move on. This start/stop movement is called *iteration*. When movement begins, there appears to be *bifurcation* or splintering, which is a slight or profound change in direction.
- *Bifurcation* initially creates new fractals of behavior.

Illustration

The equilibrium model would portray the following example:

Numerous people are in cars and are driving from work to home on an interstate. The traffic appears to move slowly and fairly orderly. The flow of cars starts and stops and goes from origin to destination. There may be an auto accident on the interstate and an individual in one of the cars has a cell phone and calls the police. They show up and circle the autos involved in the accident. Other cars generally form a line around the accident and move on. The model deals with tension management, integration of the parts, ability to change, and the function of the interstate to complete its task of getting cars from one place to another. The whole is greater than the sum of the parts; one aspect of behavior triggers change in all other aspects.

The Chaos model would portray the following:

Numerous people are traveling in cars from 50 to 75 miles an hour. Most are just a few seconds from death and/or dismemberment. Cars zoom in and out and are bumper to bumper. Some are in their cars praying, others are listening to the radio very loudly, and still others are listening to relaxation tapes. Some have road rage and others have road anxiety (Snell, 1997). Still, others fully enjoy or are not agitated by the traffic. One car has a flat tire and swerves in front of another. That car explodes into the first car and soon seven other cars become involved in the accident. Fire breaks out in one of the cars. One person is dead and three others are severely injured. Cars continue to zoom in and out, and near-collisions occur. Life goes on.

When we get up close, cars are really acting imperfectly or erratically. Cars do not form perfect lines nor are they equidistant from each other as the equilibrium model connotes. When movement of one car drives along imperfectly and we take a picture of it (or measure it), it is

called a *phase portrait*. *Attractors* cause the movement, changes, stops, and starts of the individual cars within the traffic rush. This erratic behavior is called a *fractal*. It is non-linear or erratic. When a car makes lane changes or related behavior it is a *bifurcation* or splintering.

So of what practical value is this relative to learning about human behavior? In the illustration above, we may fly in a helicopter and be able to tape the behavior of each individual car that comes onto the interstate from a certain entry/exit for a period of two minutes. It may be that we can now, with a series of cameras watch, as an example, 15 cars moving from their origin to a 10-mile destination. We may notice that each one, *up close,* is somewhat erratic. One of the cars is so chaotic that it pulls off to the side of the road. Three others will drive uneventfully and leave at an exit seven miles from where they came onto the interstate. One car drives bumper to bumper with another, as a truck swerves beside the two. Another wants to turn, but at the last minute is in the wrong lane and must go out of its way to get back to the destination it originally wanted. All get to their destinations.

So what have we learned?

We have been able to measure individuals as the group process (all driving the interstate) continues on. In equilibrium theory, we usually do not get that close to the behavior of the individuals. Those 15 car drivers, for the two minutes we were taping them, not only caused their own behavior, but also helped cause the behavior of others. We also see each individual is not equal in his/her impact on the others. What we see is messy. We can now see, however, we may save lives if we have more signs for a crucial lane change, without which may cause numerous individual deaths even though the equilibrium of the system functions quite well. We may also see there may be behavior we cannot control or predict because of erratic driving. Chaos Theory gives us clues about problems to be encountered in the future.

The movements and stops of the cars is due to *attractors,* and the above should fall into place. Incidentally, a *U.S. News & World Report* (Wilson, 1998) article on the decline of crime suggested numerous individual, as well as group, events that appear to have no direct relationship to each other helps to account for the decline of crime. *This would approximate Chaos Theory*.

Catastrophic Theory

This theory attempts to explain rapid and explosive change. The *activist-directed* Catastrophic Theory attempts to explain *why* there is explosive change. In other words, we are talking about forms of erratic, yet micro-revolutionary or activist-directed reform behavior. Why is it that *push* sometimes goes to *shove* and then to explosive change?

The theory stated is as follows:

Stability can eventually give rise to agitation. Agitation gives rise to flight or fight. Flight becomes fight if an individual explodes over a catastrophic fold. Catastrophic fold then subsides to stability.

Imagine the cars, which have been zooming to various places, going from origin to destination, come upon a large wave in the highway. The wave occurs in one lane, but not the other. The uphill two-way lane has a huge wave or fold and the other is level. There is no other way home. The wave is really the sinking of one lane due to soil erosion. Travelers begin to push and shove to get to the good lane that is traversable. There is a risk to go on in the bad lane even though the bad spot is less than a car's length in size. As the traffic backs up, those near the bad lane must either take a chance and leap over the wave (or sunken lane) or continue to remain idle. People continue to honk, individuals get out of their cars, shouting gives rise to fist fights and someone calls the police from a cell phone. A helicopter with the police arrives at the scene and re-establishes order. The one lane is closed for repair and the other remains open as the traffic is directed in such a way all can get through the area and move on to their destinations. Emergency money for the state's infrastructure is directed at making this area a four-lane highway.

What have we observed? It was not the whole system, but individuals festering around the wave or buckle in the highway that caused the violence that gave rise to change. The highway had been deteriorating for years, but the wave or buckle in the road became the "straw that broke the camel's back"; and change, rapid change, came about.

Samuelson (1998) suggested that an accumulation of tiny events gave rise to the changes in the crime rate. He noted: the lesson is that small changes feed on themselves, cause people (and institutions) to behave differently and then crystallize into huge shifts.

Catastrophic Theory best explains his statement about the messy behavior of individuals rather than the institutions causing rapid explosive change. Systems theory has some difficulty with explaining how changes occur and yet equilibrium still remains. Catastrophic Theory may help explain rapid and explosive change.

Topological Theory

Topological Theory tries to explain how subtle thought and action intertwine and gradually change people's attitudes and behavior. A Mobius band is a strip of paper that has been twisted once and then reconnected with glue. Imagine an ant is placed on the band, and then scurries along to get away from predators. As it runs along the band, it goes from the outside of the band to the inside, because of the twist. This activity is not necessarily understandable to the ant, but to the outside observer the twist makes a smooth transition from inside to outside. This transition is the relationship between thought and action and how both gradually change over time. Inside thoughts can become outside action and action triggers thought. It is done when the ant in our metaphor crosses the bar that holds the twisted strip together. Crossing the bar means there is a spark of creativity, understanding, or making sense of the wider world and defining it. It deals with the gradual change of the internal and the external.

Thus, interaction is continuous. Continuous behavior creates bar crossing. Bar crossing creates outside action, which translates to inside thought. Inside thought creates new interactions. Gradual change has occurred.

Illustration

To use the metaphor of drivers and highway again, assume cars are driving along the highway and their drivers are determined to reach their destinations. They are traveling, however, with a negative attitude about driving. As they travel there is a very slight incline in the road, so gradual and so gentle the car always appears not to slip off the highway. As the car continues it actually crosses the bar and inside becomes outside, but the driver is unaware of the change, and feels this trip on this highway has been a positive experience. It was a good trip.

What can we observe from this theory?

At times, attitudes and changes in behavior can be gradual. It is so very gradual that when the change occurs, it is hardly noticed. Where Catastrophic Theory illustrates explosive rapid change in attitude and in behavior, Topological Theory describes gradual change. As an example, an editorial in *U.S. News & World Report* (Zuckerman, 1993) stated 73% of Americans believed crime to be a major problem in the country. That same year a new Democrat, Bill Clinton, was conservative on crime and yet was not perceived as a racist. This change, years in the making, found even more minorities in high crime areas wanted more police and more conservative policies toward offenders. In other words, numerous moderate and progressive Democrats, Republicans, and Independents "crossed the bar". On the other hand, when funding was available they still wanted early intervention to deal with some of the initial causes of crime, but the first priority was more police and incarcerations.

Topological Theory is perhaps the theory to be most complementary, if not indigenous, to Tnteractionist Theory. Portions of the theory may be seen as the dispenser and supportive of the social construction approach.

Explanation

It may be the three micro theories indicated above may complement the three major theories of the social sciences. The equilibrium model (functionalism) may be represented by Chaos Theory. Catastrophic Theory could assist critical or conflict theory. Topological Theory could support interactionism. (However, Milovanovic (1996) or any of the other sources listed above suggest this.)

Additionally, by necessity to us, the terms modeling and theory are used synonymously and are used as the same nomenclature as Milovanovic. We understand them to be different. Milovanovic hints these three theories may become quantifiable.

The three theories discussed in this article may/may not be associated with postmodernism, deconstructionism, feminist theory, or critical criminology. We believe these three theories may complement but not replace the current macro theories now used in the social sciences. We do not believe these micro theories will replace systems theories or other major theories now prominent in the social sciences. Last, this derivation from quantum physics will probably be most useful at the level of discovery and hypothesis building, but not at the level of verification.

Conclusion

This has been a discussion of three theories that have been described as post modern. Chaos Theory tries to describe phenomena at the micro level that are messy and disorderly but in a paradoxical way give rise to order. Catastrophic Theory attempts to describe explosive and rapid change. Topological Theory attempts to explain gradual and slow change.

Dr. Joseph Cangemi (one of the authors) is a well-traveled, worldwide corporate consultant and journeys in numerous third-world countries. One of the things he noted is that disorder appears to be order to the culture's elite. Visible macro disorder, where very few things and relationships work, drives the majority of the population into passivity and squalor. Thus, the elite remain in control because they know or are familiar with the real order within the disorder. For the elite, the social system is workable, efficient, and rewarding. This observation still supports Chaos Theory.

Dr. Kay E. Payne (another of the authors) suggests that religious conversion or change in religious perception has provided a gradual change in interaction with others. This would support Topological Theory.

This has been an interpretation and simplification of Dragan Milovanovic's *Postmodern Criminology: Mapping the Terrain* (1996). It was originally published in *Justice Quarterly.*

The authors added possible applications to the major fields of sociology, psychology, political sciences, criminal justice, and economics.

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Chaos Theory, Catastrophic Theory And Topological Theory: Examples And Perspectives

Joel C. Snell, Joseph P. Cangemi, Claire Noble, Kay Payne, and Casimir J. Kowalski

Chaos Theory is another complementary explanation to systems theory. Chaos can also be explained in terms of power. A tiny elite can benefit from what outwardly appears to be disarray. An example of catastrophic theory is when the psychological contract between workers and company are strained to the point of a strike. Negotiations can settle the expanse between the two and a new synthesis emerges. Topological Theory is best explained in subtle attitude change of individuals and groups. Although the change is gradual, over time, a new paradigm emerges that can be profound. The article offers readers a wider perspective on all three theories.

Chaos Theory

Chaos Theory describes the underlying order in systems which appear chaotic. This suggests the systems order themselves from another level rather than intrinsically. Shults (1992) compared natural systems of Chaos Theory to Christ as Logos, which can then be viewed as an ordering principle for Christians. When applying Chaos Theory to administration, management, and public policy, it provides a new large-scale way of thinking upon which we can base inquiries. Chaos from a modern administration perspective "means too much happening too quickly all at once, and seemingly out of control and incomprehensible" (Overman, 1996). Peters (1987) developed the concept of "thriving on chaos" as a principle for modern managers. Rather than using dissonance reduction as a model, Chaos Theory suggests tolerance of ambiguity. Paul (1995) suggested models of conflict management from Japan and Hawaii illustrate problem-solving methods more tolerant of ambiguity than Euro-American models.

Understanding the underlying order occurring at a different level enables managers to understand systems in motion. Changing structures and relationships in organizational systems appear to be the rule rather than the exception for organizations preparing for the twenty-first century. Briggs and Peat (1989) explained all sorts of natural phenomena such as changing weather patterns, heart arrhythmia, and the congested movement of traffic in South American and European countries by using Chaos Theory.

The theory might be described as a complex, dynamic pattern of order out of seemingly chaotic behaviors (Prigogine & Stengers, 1984). Waldrop (1994) claimed these systems appeared so complex and dynamic that the small human mind could not grasp the order, so it sees it as disorder. Wheatley (1992) claimed most managers concerned themselves with structures rather than processes, concluding that most organizations could dissipate structures and reconfigure them at higher levels of complexity than previously thought, in order to better deal with the new environment. Managed and guided from information from outside the organization, dynamic organizations rely not on controlled inflexible information systems, but rather on the constantly

evolving results of the organization. Even the language of Chaos Theory differs from previous old Systems theories.

Systems Theory language uses terms like input, process, output, and impact as linear elements of the system. Chaos Theory uses terms like order and chaos to describe images of the system. Systems Theory language describes equilibrium or homeostasis of systems with stability over time. Chaos Theory appears far from equilibrium, packed with energy that flows from outside the organization. Systems Theory uses terms such as feedback and control…words that dampen deviance. Chaos Theory uses bifurcations or moments of choice in a systems evolution. Systems Theory language reflects forward movement and planning communication which amplifies diversity. Chaos Theory reflects irreducibility, suggesting that knowing a system is not necessarily knowing its parts. Systems Theory recognizes holism, as the whole is equal to the parts, while Chaos Theory refers to periodicity as a time period between fluctuations of chaos and order (Overman, 1996).

Chaos Theory – Another Perspective

Another perspective on Chaos Theory becomes evident and is observable when one visits some of the major cities in the world, particularly some of the major cities in developing or undeveloped countries. As one of the authors of this article explains (Cangemi et al., 1999), "Having resided outside the United Sates for more than a half dozen years and traveling to more than 40 countries in the last 30 years, living first hand within an environment encapsulated by apparent chaos is indeed a stymieing experience – stifling as well. But a closer look and deeper analysis of what is actually occurring will be surprising, if not shocking, to the *un*anointed, unwary observer."

Upon observation, in any one of a dozen cities or urban centers in Latin America, for example, chaos seems apparent everywhere. Drivers often *stay* on the wrong side of the road – deliberately pass on hills, do not stop for red lights, park in ways that are truly obstructing – besides obstructing traffic; stores often open and close when they wish, owners often take holidays when they desire, prices are often volatile, directions are often inaccurate (if not outright wrong), maps can be erroneous, offices of important individuals are often not where they are supposed to be; and, if they are, the occupants who are supposed to be in them somehow never seem to be there. One is sent from office to office, from one direction to another, with people being shuffled around like cards, getting little accomplished and usually giving up with perhaps a sigh under their breath, "Es come debe ser," ("This is the way it's supposed to be.") or "Es lo que quiere Dios." ("This is God's will.").

Most people in these circumstances simply give up. Their complaints and ideas get nowhere – go nowhere. They learn to suffer in silence, to go without and, in the end, they do nothing. All this chaos, all this movement, all the running around, all the "He's/she's not in today." "You're in the wrong office." "We don't do this anymore." "Come back later." "You're too late." "We don't have any." "We can't do anything about that."…only serve to dishearten the vast majority of the people who end up doing nothing – and, unfortunately, even often thinking nothing. Not much gets done.

This is the way it is supposed to be. This is the way it was designed to be. To some significant degree, this was planned; or, if not planned initially, over time it developed to function exactly as the chaotic system functions today. There is little or no effort to move the chaotic system out of its current chaotic state. Keeping it the way it is, resisting restructuring, or fighting change, is no doubt a conscious decision. When one digs beneath the surface of all this chaos and confusion, then one may see, learn, and perceive all of this as quite desirable with respect to a very small fraction of the population who hold the power and authority in each particular society where the chaos exists. Therefore, it permits them incredible latitude, unimaginable liberties, unchallenged rights and privileges, unquestioned authority, an opportunity on a scale unattainable

to the vast majority of citizens, and the availability and utilization of the country's assets and resources.

They never need to deal with the chaos of airports, immigration, customs, police, inspectors, etc. They are whisked through without their bags ever likely to be opened. They often have access to and even control the very personnel others rarely get to see; many times they are relatives. They know the system because they own the system. They know the combination to the system; they have the network to get what they want when they want it. There is no chaos for them. They know where the order is and know how to use it. Resisting change is in this group's best interest. This privileged group may comprise less than one-tenth to one-quarter of one percent of the society in a developing or underdeveloped country. Such chaos keeps the population at bay, usually ignorant, allowing this thimbleful of people virtually total control of a society and its resources. In one of the underdeveloped countries currently more than 50% of its millions of citizens are still basically illiterate. Only a few people control this society, and they virtually own everything significant. The chaos experienced by the masses keeps them at bay – impedes the development of leaders who can challenge the system and change the chaos. Many times, should a competitor or a leader arise from the masses who might be clever enough to use the system for his or own advancement, he or she might be tolerated for only a while. In a recent case of just such an occurrence in an underdeveloped nation controlled by a few – very few – an up and coming successful business leader was advised to leave the country. He decided to defy the "*in"* group (the ruling class) and stay, and he continued to use the system for his own benefit quite successfully – unusual in this society –and, out of the chaos, came an allegation and indictment accusing him of embezzling the state out of millions of dollars. The interloper currently is in jail serving a multi-year sentence for "embezzlement".

He was able to use the chaos to his advantage. The advantaged few warned him and, apparently, decided to teach him and others, who perhaps were thinking of following in his footsteps, a crucial lesson. In short, chaos in these societies is, in one way or another, undoubtedly going to be continued. It is desirable for those who control, for those who have authority within the chaos.

If one analyzes carefully and cuts through the layers and labyrinth of obstacles and dead ends, one would find order indeed exists. For example, the senior author of this article (Joseph Cangemi) developed some serious passport problems while crossing the border between Colombia and Venezuela (at the border cities of Cucuta, Colombia, and San Antonio, Venezuela). An important stamp was missing from the passport, which was discovered too late to correct. Military personnel, searching all vehicles, came to the taxi in which he was riding to the airport in San Antonio (a few miles from the Colombian border) and asked to see his passport. After examining his documents he was ordered out of the taxi at gunpoint, ordered to go back to Colombia, but instead found a hotel at the border and looked for help. None could be found. He waited three days in the hotel, seeking assistance until he could call a "friend" of the governor of the state in which San Antonio was located, who then called the governor, who got hold of the military and within a short period of time an aide was sent to the hotel to retrieve his passport. Later the aide returned and whisked him in a private car directly to the San Antonio airport. The military had already been apprised of the situation, knew who he was, ushered him aboard a plane, returned to him his passport and bade him farewell. His passport problems were taken care of immediately by the lieutenant governor of the state where he was residing with no problem.

Certainly chaos was encountered, yet,, within this chaos, there was order, order known only by a select few to be used when essential, when called upon. Order within chaos does exist and is known and utilized and open only to a few; the few who remain in control year after year after year while their cities become more congested and less controllable, their systems more antiquated while their populations languish for more adequate roads and housing, better nutrition, and improved life changes. Try to change all of this and observe what often happens: the military is called out of their barracks, tanks begin to roll, houses are searched, people are exiled – or

disappear, or "death squads" take matters into their own hands. So, chaos is the way it is, the way it is supposed to be, for the masses in these societies (Cangemi & Kowalski, 1983).

Catastrophic Theory

When two entities, separated by symbolic artifacts such as labels (management and employees) and separated by space (management offices, employees on the line) and possibly even separated by time (day and night shifts), communicating with one another often becomes entangled with elements of what is unknown. Consequently, individuals in organizations rely on expectations of reality, certainty, and simple causality. Payne, Kohler, Cangemi, and Fuqua (1999) described these expectations as an unwritten psychological contract on the part of an employee toward his or her new company, and also in the unwritten expectations of the organization regarding the behavior of the employee. Robinson, Kraatz, and Rousseau (1994) believed violation of these expectations eroded the relationship and the belief system of the reciprocal obligations in organizations when one party perceived the other had violated their agreement.

Violations of these expectations by the employer may not only affect what the employee believes the organization owes him or her, but it also may affect what the employee believes he or she owes the organization. When an organization violates these unwritten agreements the employee views the organization as no longer sharing (or maybe never did share) a common set of values and mutual expectations. When this happens communication breaks down, understanding fails, and frustration increases (Sims, 1992). Violations weaken the bond, and the violated party feels abused and loses faith in the benefits of staying in the relationship (Rousseau, 1989).

Catastrophic Theory is observed in the process of the destruction of the psychological contract. For example, the psychological contract is evident on the part of an employee when the employee believes the company or organization will treat him or her with fairness, equality, opportunity, and human dignity. The employee believes that the employer will provide the appropriate equipment and tools with which to work, will provide necessary and appropriate communications and will provide opportunities to learn and to advance. The psychological contract on the part of the employer often involves the belief the employee will give a fair day's work for a fair day's pay, will come to work each day (on time), and will contribute to the empowerment and success of the company.

Observations of many organizations over the last thirty years by Payne, Kohler, Cangemi and Fuqua (2000) have showed the following:

Many organizations often start off respecting and fulfilling the psychological contract toward their employees. However, it has been noted over time, many organizations "slip" in their responsibilities in fulfilling their obligations regarding the psychological contract. For example, over time, they make greater demands on employees, often through increasing work schedules. Many organizations often force employees to work 7-days-a-week – for months at a time – "burning out" employees and causing them to resent the organization and its leadership. The organization sometimes goes from an 8-hour-day to a 12-hour-day shift schedule *permanently*, showing little concern for the employee's health, fatigue or time allowed with his or her family. Also, the organization often "takes back" benefits it gave in the beginning, fails to keep up with legitimate benefits, or freezes raises for two or three consecutive years while top management enjoys bonuses and benefits as can be read about in the *Wall Street Journal.* Put all of this together with lack of training in people skills for front line and departmental managers, and *we have the foundation for catastrophe in the making.*

The employees begin to feel, with the first evidence the psychological contract is being violated, a bit of betrayal on the part of the company. As more and more evidence is demonstrated the company is more interested in profits and *its* needs than employees' needs, alienation between the two parties sets in. A mounting sense of irritation and frustration usually

develops among employees, then the frustration hardens into anger, which all too often ends up in eruption. Employees that do not have a union start following an organizer, stop work, vote for a union, bring the union on board, and often explode…*strike*! During the strike the two parties negotiate. After the negotiations are over and the situation is restored to order, stability returns to the work environment. Both the leadership of the organization and the employees get on with the process of working together again, and life goes on in a rather predictable way.

The following models depict the process of Catastrophic Theory: Models I, II, III. Model IV depicts a return to stability.

Employees' Needs Organization's Needs

MODEL I

The Path to Catastrophe

Explanation: The perception of both employees and their leaders: overlap depicts each is concerned initially with satisfying the other's needs - especially psychological needs. This produces a positive work climate and promotes harmony.

Employee's Needs Organization's Needs

MODEL II

The Path to Catastrophe

Explanation: Over time the organization becomes less interested with the needs of employees, placing the organization's needs foremost. Minimal overlap depicts the organization's declining interest in employees' needs.

Explosion!!!

Employee's Needs Organization's Needs

MODEL III

The Path to Catastrophe

Explanation: Employees perceive the organization is not interested in them or their needs, as they were initially. The organization continues to make more and more demands of employees; employees resist. The organization becomes more demanding and the two entities become alienated to the point of significant frustration, which turns to anger - which all too often leads to hostility, then to an explosion of sorts: a union, if one does not exist, fisticuffs, a walkout, a strike, etc. Note the lack of overlap between the two entities.

Employees' Needs Organization's Needs

MODEL IV

Return to Stability

Explanation: After the explosion, reasonable stability returns, usually the result of negotiations, until conditions deteriorate over time again, bringing about another catastrophe. Note the amount of concern for each other's needs has diminished, as depicted by limited overlap. The situation now is delicate and tenuous. For example, a large southern manufacturing facility, paying the highest salary for employees in this major industry in the world, experienced 151 strikes in 20 years – apart from slow-downs and sit-downs.

With the return to stability, it seems obvious the catastrophe, quite probably, might have been avoided had the leadership been a bit more sensitive and used better judgment.

Topological Theory

Topological Theory may be seen in the effect of self-analysis, self -reflection, self-examination and the result they can have on human behavior. An examination of one's paradigms, when measured against solid logic, or scientific data, often weakens the hold they have on the individual and his or her resultant behaviors. A logical and/or scientific analysis of one's thoughts can lead to what Ellis (1996) described as a strong refuting – strong disputing – of one's thoughts, ideas, and para-digms with the result being a modification in the thinking and observed behavior of the individual. As a person gathers more data regarding his or her paradigms, from outside the "self", it may lead to modification of thought with subsequent changed or modified behavior. An example of this process might include religious paradigms and behaviors. Religion relates to the manifestation of devotion to an acknowledged ultimate reality or deity often accompanied by scrupulously and conscientiously held beliefs or observances.

As an example of Topological Theory, an individual may learn from childhood that all religions are basically the same: God loves everyone and everyone will consequently go to Heaven. Such a religious paradigm might regard God as a *softie*, a friend, pretty easy-going about sin. As a person gathers more data about God, through a source outside of him or herself, often through religious scriptures or fellowship with others of the same faith, he or she might learn God not only loves everyone, but demands perfection. Reconciling the apparent contradiction between God as love and God as judge may generate enormous dissonance. As one engages in self-reflection, self-examination, and self-analysis he or she might discover imperfection in the self. Then an individual might begin to wonder how he or she might appease this God who demands

perfection from one who is incapable of providing this "so-called" perfection. In gathering data from a variety of religions one might conclude obedience to God involves following His laws in efforts to please Him.

So, an individual tries behaving rightly, but upon self-reflection, self-analysis and self-examination, again finds he or she falls short. Angst and guilt creep in with further self-reflection, self-analysis, and self-examination, as one recognizes the chasm between God and self. However, when one relies on something outside the self to achieve this perfection on his or her behalf, such as the death of Christ (the Logos) for all of Christendom, who led the perfect life (we are taught), on our behalf to accomplish the bridging of the gap between God and self, a person has a paradigm shift and subsequent behavior changes as well. Angst and guilt disappear with this renewal, this perceived reconciliation with God.

Such a paradigm shift occurred in the life of an acquaintance of the authors of this book. After years of self-reflection, self-examination, and self-analysis she could not figure out how to achieve a close relationship with God. She experienced low self-confidence, low self-esteem, irritability, strained relationships and a "me-first" attitude. She made efforts to control everyone around her, trying to mold them and herself into what she thought they all should be. Then, after reaching despair, and giving up trying to do it herself, she had an "aha!" experience, a paradigm shift, a change in thinking. She perceived reconciliation with God through the actions of God *Himself*, through Christ. Once this occurred she experienced behavior-changing attitudes. Toward others she recognized an unassuming resonance to forgive, a resilience to meanness from others, and this became obvious to those around her in her reactions and communications from her. *Before*, she had been critical; *after*, she became an encourager, *before* she had been jealous, *after* she became joyful for others, *before* she had experienced angst and guilt, *after* she experienced peace. These changes opened up new opportunities for personal advancement and relational closeness, for which she recognizes with gratitude the paradigm shift.

In another example, another acquaintance of the authors experienced religiosity in a different way. He explains, "…often a person learns and comes to believe his or her religion is the only true one that exists. As one grows older and learns more about the world and something about the other religions and discovers there are hundreds and hundreds of religions in the world, the idea of there being only one true religion no longer makes sense to him. He continues to choose the religion of his upbringing because he is comfortable in it, but will, from now on, be comfortable with other religions and people who believe in these religions as well. He feels he will be at home in other houses of worship and will feel at ease in any one of them." To him it makes no sense to hold to only one true religion because he believes it develops prejudice toward those who believe differently. The nightly news frequently reveals how some people kill others because of their strong convictions and prejudices against those who believe differently than they do.

As one zealously adheres to his or her religious beliefs, others, who believe differently, often are recognized as infidels and unbelievers, with whom God will harshly judge. Such advocates may be heard to say, "They will get what's coming to them; they will not go to Heaven." The paradigm shift experienced by the acquaintance of the authors noted it does not have anything to do with this kind of fundamentalist thinking, "…even though I was brought up this way. I'm now going to invite Mustaf and his wife Juda to our house and perhaps I can learn something about the Muslim religion. Then I am going to invite Joseph Levy and his wife Naomi over to enjoy their company and learn something about the Jewish religion. In the immediate future I am going to a Muslim Mosque, and then to a Jewish Synagogue. I intend to respect all sorts of beliefs, which differ from my own. The diversity of beliefs is really exciting, interesting and challenging. I was brought up with a particular religion and I am comfortable in it, the same as others who were brought up to think and worship differently. If I were born to a Jewish or Muslim family I would quite probably today be a Jew or Muslim. All of this seems to be logical,

and all of this makes sense. I will never discriminate again toward anybody on the basis of his or her religious beliefs."

After this type of paradigm shift an individual can experience an appreciation for new thought, consequently providing a new under-standing about a situation or set of events, providing a foundation for different thinking and different behavior which might not have been possible without a paradigm shift. Both examples help to explain Topological Theory.

Conclusion

This article complements *Introducing the New Science: Chaos Theory, Catastrophic Theory and Topological Theory*, (1999). Chaos Theory assumes that there is generally an order in what appears chaotic. The examples are third world countries where outward is chaotic and yet internal order is known and manipulated by the elite. Catastrophic Theory deals with long periods of delay/decay until there is major disruption. An example is the violation of the psychological contract between worker and corporation until there is an explosion of violence and unionization, which then can lead to a new balance. Last, Topological Theory deals with slow incremental changes over time. Thus, a paradigm shift is a gradual process. An example was given of a new religious orientation evolving over time.

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Chaos Theory, Deconstructionism, and Post Modern Theory

Susan Andersen, Joel C. Snell

At times, postmodern theories are clumped together. Unfortunately, there are various forms that are not necessarily connected. Such is the case of chaos theory and deconstructionism. The authors discuss the differences.

Introduction

Chaos Theory dates back to the mid 70's, as does deconstructionism (Snell, 1978). They have some commonalities. Both are postmodern, non-linear, and emphasize the impact the micro level has on the macro and vice-versa.

They also are concerned with the basic tools of humanity: words and numbers. However, after these similarities, all else appears to divide the two.

The authors suggest that partial deconstruction is a useful tool and that Chaos Theory is an excellent compliment to the meaning model, conflict model and equilibrium model of the social sciences.

We believe that Chaos Theory cannot stand-alone and that decon-structionism in its full extent is not useful or helpful.

Chaos Theory

Born in the mid-1970's, Chaos theory is concerned with movement and randomness. Importantly, through a series of attractors, bifurcations, iterations, and related, the world continues. It does so in what appears to be a chaotic movement of events, people, places, and relationships. New phenomena appear to be "wild cards" and come out of nowhere resonate beneath, above, or outside the view of the observer. There appears to be an interconnection between all things. It is quite possible the movement of a butterfly's wings could cause a hurricane in another part of the world.

Thus, even the most robust social science predictive model is subject to vulnerability. Chaos theory humbles both the physical and social sciences. The arts, humanities, theology and related disciplines try to capture or describe this hard to measure elusive trigger. In some ways, this could be the science of the Holy Spirit (Christianity), para (Hinduism), wu (Taoism), suchness (Buddhism), and other major religions (Snell et.al., 2001; Setzer, 1999.). Science calls it "flow."

***So what*?**

That is our point. We believe that Chaos theory helps to explain movement and interconnectedness, but it's fuzzy non-linear quality does not do as well for the observer as the three models discussed above.

Additionally, topological chaos and catastrophic chaos may explain slow and gradual change or rapid change, but we do not want to abandon the social change models now standard (Cyclical Theory and related).

A practical example for business is, if a company finds a "formula" that is legal and is profitable, we do not suggest change, even if the world is constantly changing. However, we would suggest that management find numerous strategies within the formula to deal with the "*butterfly effect*" as previously described.

Deconstructionism

Again founded in the 70's, deconstructionism is postmodern, non-linear, has micro/macro concerns, and is troubled by words and numbers. Partial deconstruction is very helpful. As an example, "race" can be a social construction that may do more harm than help if a person is defined by "one-drop" methodology. In other words, many Caucasians, Africans, and Asians may have other racial heritage, but are really oriented to their appearance and experience. When race is deconstructed in this manner, it can be very helpful.

Deconstruction maintains that society is a construction by a ruling elite that owns the media and related environs and can use language to promote its own agenda. Since it believes there are no absolute values, one must analyze all language and ask who is being served by the person(s) using it?

"Marginal" groups such as women, gays, and racial minorities try to "unmask" the motives of the dominant culture and have thus used deconstruction.

Jacque Derrida, the main founder of deconstruction, utilizes the creative play of language to break down our notions of any absolute meaning. He shows us words can only differ from what they say they are saying. Thus, language is false and can never reveal "truth". Yet humans are symbolic creatures.

This "emphatic moment" should leave us free of the prison of language; we then must reassemble reality to carry on our everyday activity (Setzer, 1999; Pinker, 2003). The very web of existence is woven by words. If we destroy words, our active cerebral cortex will find new words and non-verbal communication to transcend the here and now (Pinker, 2003). Words that can

enslave us can also free us. While deconstructionism is good at pointing out social injustice, it is weak at upholding positive values to live by.

If language is at times arbitrary, it is also capable of connecting us to nature, the universe, and other people through art, prayer, and ceremony (Setzer, 1999).

Chaos and Deconstructionism

Chaos is concerned our words cannot *really* capture a moving elusive reality.

However, the theory does not give up on words or numbers. Both symbolic systems are considered primitive tools to describe what moves, what can and cannot be seen. A primitive tool is still a tool.

Deconstructionists, on the other hand, leave us hanging. There isn't absolute meaning; therefore, we can only act on the basis of "AS IF". Language is the way we construct life as we go along, but it only tells a lie.

Deconstructionism needs a new movement to correct itself. Dismantling social constructions and collective definitions that are not true or are rarely valid would be an excellent contribution to the field. It could also join forces with cognitive psychologies, sociology's symbolic interaction, and general semantics.

Other Postmodern Theories

There are other new age and postmodern theories and speculations that may appear to be related to Chaos Theory. We do not want the association.

We can visualize numerous other non-traditional explanations will want to associate itself with Chaos if it becomes more well known and popular.

We believe *The Tipping Point* (2000) by Malcolm Gladwell is an excellent example of Chaos Theory. However, we can see Chaos may be attached to an established field such as the Chaos of Chaucer, the Chaos of the family, Chaos management, or any other area. They may be valid or not. We don't want any part of it.

In the past, Marx, Freud, Parsons, and other have had their paradigms and vocabulary applied to numerous areas and, for a time, would assure the scholar of a publication.

We believe it may happen with Chaos Theory, but do not want to own it. We may even use some of Chaos ourselves, but will do so with caution.

What others do is their problem or opportunity. We will be happy to remain on the sidelines.

Conclusion

Chaos Theory and deconstructionism have some commonalities. They both are concerned with how words may/may not describe micro elusive changes.

Both came to college campuses by the 70's; both have a following. They differ in that Chaos Theory wants to continue to use words and numbers, and deconstructionism wants to free oneself of them. Intellectually, we may have elusive experiences that may cause change in our life, as well as the experience of others.

Deconstructionism then tells us we lie in retelling our experience to others. Well, yes we do. However, if we give up the tools of language, we have a terrible time getting from one place or experience to another.

Chaos Theory indicates the elusive moment is *almost* indiscernible, but we will carry on with words and numbers. The quest is not giving up on words, but trying to use words that *closest* describe the event.

Inadvertently, Chaos Theory may have been described in the past as a peak experience, an unintended consequence, a micro-trigger event or a related term. Now the noise of the extraneous is being included.

Other postmodern theories may begin to borrow from Chaos Theory because of its novelty and legitimacy. Chaos Theory jargon can help another postmodern theory become acceptable, but we do not wish to be part of that, as stated earlier. Or, we would use the theory with caution.

Partial deconstruction is useful, and Chaos Theory appears to compliment the established theories of equilibrium (structure-functionalism), symbolic interaction (meaning models) and conflict theory. However, like existentialism, so popular and prominent in the 50's and early 60's, it needs another paradigm or model to lean on.

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Chaos Theory and Game Theory

Joel C. Snell

As Hollywood would portray it, John Forbes Nash, the subject of *A Beautiful Mind*, created game theory in a bar. His drinking buddies, as well as fellow math students, were in a local student nightspot. In walk a number of young ladies looking for mates or someone with whom to pass the night. For whatever reason, all the males wanted the same young lady. He surmised this could not happen and that became the genesis of game theory. If we can step aside for a moment, the women were doing the same thing. Further, they may have wanted only one male also but would have to play strategies slightly varied from the males.

Game Theory thus had its beginnings. The strategies vary from the most altruistic to the most selfish. It can be reduced to algebraic form (Thomson, 2001). The theory has spread its wings and infiltrated into math, science, philosophy, and advocacy (Shubik, 1998). The decline of small group research from primary group to game theory and it's cousin, "prisoner's dilemma," were due to the ease of research into the latter rather than the former (Snell, 1988).

In *Businessweek*, March 18, 2001, Peter Coy described and condensed work from Goeree and Holt in *American Economic Review*. Basically, Goeree and Holt found individuals often act irrationally, which would sully the game theory premises. We want to quote Coy. *He states*:

"Holt says the purpose of the paper was to shock theorists into seeing situations where game theory doesn't work. Without insights from behavioral economics and other fields, pure game theory can be a beautiful minefield."

Chaos Theory can help *game theory*. On balance, it would suggest, regardless of the motives of the actors (rational, irrational, non-rational, or other), complications about actions are assumed. Game theory will work up to a point and when that tipping point is reached chaos begins.

For the purpose of this discussion, let's go back to the bar of the famed night when Nash began his theory. Hollywood has it that the most attractive female (in the eyes of the males) gravitated to Nash. Within a few minutes, she was so repulsed by him that she sought out other males. Hollywood stops there, but let us move forward. She probably returned to the other unattached females and through glances and gestures established a territory and proceeded to indirectly pursue another male. Thousands of outcomes may have occurred after that meeting. It is likely that none of the females married any of the math males from the nightspot. Each actor, regardless of sex may probably marry someone on the basis of numerous criteria. Chaos Theory suggests that strategies may still be identifiable, but probably non-rational. In other words, the bigger picture is through the chaos of beginnings and endings, most will marry, reproduce, perhaps divorce, and die. The big picture or micro-level is that mating occurs, along with reproduction, and then the actors pass on into the ages. Thus, through the chaos, order still perseveres.

In the mean time, game theory may catch strategic actions in certain settings and still make the theory viable, but flawed. However, the flaws are not enough to put it on the ash heap of history. This also applies to the meaning model, conflict model, and equilibrium models used in the social methodologies or social sciences.

Thus chaos can complement game theory.

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Chaos Theology

Joel C. Snell

Dr. Sarah Voss writes in the *U-U World* (May/June 2003) there is a strong possibility God can speak mathematically. The idea is very old and traces back to the ancient Pythagoreans. In a sense, God is or dependent on the right relationship between numbers. In her *Mathematical*

Theology: An Interpretation she uses such terms as "sacred geometry," "chaos theology," and "quantum theology." She also states the false dichotomy of math and the spiritual world is now coming to an end.

Mathematical theology is the study of the divine through numbers. It has two theoretical strategies. The first is the use of science and precise math calculations for interpreting God's revelations in nature. The other is through metaphor of the order of God. This is the hope. God speaks through the chaos of spiritual fractures. Voss then discusses the life and work of Georg Cantor. He drew his insight from math, Judaism, and Christianity. His former teacher (and influential mathematician) Leopold Kronecker heavily criticized Cantor's work. Cantor died in a mental hospital in 1918, a broken and bitter man. For those familiar with functionalism or Systems Theory, *the whole is greater than the sum of the parts.* For Cantor, his number theory suggests *the part may have the power of the whole.* In the Cantorian world, incompleteness is a necessary element to the structure of a system. Further, an entity is contradictorily sparse and many. Thus, there is the appearance of chaos.

Cantorian Theory would theologically support multiple paths to salvation, religious pluralism, and religious eclecticism. It may also suggest that God is both the personal and anthroporphic God and the Over-soul of Eastern religions. Thus, anthropantheism is suggested. At any rate, mathematical theology challenges postmodern humanity.

Chaos Theory: Three Social Science Examples

Joel C. Snell

To further clarify Chaos Theory, the authors would like to illustrate three fairly clear-cut examples how the theory can be applied to real-life society today. We shall look at *unintended consequences*, *tipping points*, and *perfect storms.* All are now common names for Chaos Theory applications.

Unintended Consequences

Lets assume that Lee Harvey Oswald acted alone and assassinated President John F. Kennedy. We have also learned since those days years ago President Johnson thought Castro had Kennedy killed and therefore had numerous agencies of the government and private sector "cover up" any possibility that anyone else was involved.

Shortly after Kennedy's death, numerous actions were taken to suggest that Oswald did the job alone. LBJ attempted to conduct such activities for a noble reason. He feared that there would be a third world war if Castro were attached to the murder. Numerous anecdotes can be summoned to suggest the Commission on the Assassination and other related activities were less than candid and open.

Without wanting to, the assassination investigation did just the opposite of what was intended. Although a war was avoided (an extremely important facet) few believed the report. Many flaws were noted and a vacuum was left for conspiracy theorists. Thus, the report and the

activities of the government shortly after the assassination *encouraged* the majority of the population to believe that more than one person was involved in the killing.

Chaos Theory is rich with various plans put asunder by other remote events. Thus, it is a possible that the flapping of the wings of a butterfly may cause a storm thousands of miles away.

Tipping Points

For years, Conservatives argued welfare essentially caused more welfare. Further, this wing of American political spectrum generally overlooked the success stories within the welfare system and the environment that flavored individuals to choose to go on welfare. Liberals, on the other hand, appeared to be oblivious to a growing number of welfare recipients and the moral calculus made by a number of women that the welfare system was a better choice than going to work, school, or related activities.

Along came President Bill Clinton, whom people of color and Liberals trusted. At times, Clinton was referred to as the Black president. In the mean time, numerous other events began to evolve that suggested the welfare system was not working. This included a number of women who pooled their children in one apartment in Chicago and left their kids in squalor and neglect. Further, PBS ran a series in which welfare fathers were interviewed and described fatherhood as a very infrequent and casual activity. Other news sources quickly followed with similar stories. Clinton had run on changing the system and when the election of 1996 came he signed a welfare reform bill. Instantly numerous states changed their systems so that recipients could only have 2 to 5 years to get off the welfare rolls.

Further, once prosperous and somewhat generous middle class started losing annual income in adjusted income from about 1967 to date. Many blue-collar families lived in neighborhoods where welfare neighbors lived a much less stressful life than the working poor, blue collar, and middle income.

There was a Conservative ascendancy with globalization and the success of Proposition 13 in California in the late 1970's. Crime was also rising in neighborhoods that no longer had active involved fathers. The family was changing all across the western world, and Americans believed welfare contributed to divorce. Although Blacks are proportionally greater in number and over represented relative to welfare and crime, whites commit most of the crime and are more populated among welfare recipients. However, closet defacto racism had once again become popular, so the change in welfare was a popular one. Further, sex roles had changed and many women worked. Additionally, birth control and family planning was no longer considered sinful. This also contributed to change.

Chaos Theory calls this "crossing the bar." Events build until there is gradual change over time. It is evolutionary rather than revolutionary. Attitudes and behaviors change. Once a new equilibrium occurs, there is reduction in the conflict between feuding parties.

The Perfect Storm

There are strategic times in history few of the generation in that time period forget. 9/11 is one of those cases. By the fact, a number like 9/11 can be given without explanation is a powerful indicator of its importance. It caused rapid and instant change. Let's review some of the elements that gave 9/11 its impact to cause a perfect storm.

1. America is a country that has not been truly attacked in over a 100 years. Where numerous other countries endure military coups or attacks from world wars, America has seen much of war from a distance.
2. The United States is the most powerful country in the world since the end of the cold war.
3. The States is highly technological so an event can quickly be telecast to the rest of the world.

4. Technology, if located strategically, can record powerful events in real time. Further, once the event has been recorded, it can be replayed over and over.
5. Cable news can now providednews coverage, 24/7 365 days a year. There is now a cottage industry of opinion makers who can instantly fill time with discussion and description of third historic event. Assistants can retrieve additional information from search engines and network files to help fill time.
6. Additionally, other experts can quickly come on shows from direct or remote sites to comment or encourage citizen opinion of the event.
7. Both local and international rites of passage and other monuments of grief can be displayed and discussed.
8. National polls and local ones with demographic and psychographic breakdowns can be administered and reported to international audiences.
9. Legislation is quickly passed that shifts the public attention from other issues to war and security.
10. Social change, unthinkable just a few hours before the attack on the Pentagon and the Twin Towers, is now not only probable, it is probable.

In terms of Chaos Theory, all the events taken together at the right time and place can make social change possible. Using chaos terminology, this is crossing the catastrophic fold. A major malfunction or disruption festers shortly and explodes into major social change. Thus, we end with three examples of how Chaos Theory has practical explanations for both ordinary and extraordinary events, and can caused both rapid and casual change.

We believe Chaos Theory will have numerous explanations and the meaning model, conflict model, and equilibrium model so very popular and necessary in social science today.

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II. Macro-Level Society

Chaos Theory and Society

Joel C. Snell, Joseph P. Cangemi

Society and Social Problems
Joel C. Snell, Joseph P. Cangemi

Chaos Theory and Society

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Introduction

In earlier articles we have described Chaos Theory and various topics relative to human behavior. Chaos Theory describes how, *outwardly,* behavior is sporadic and in disarray, and yet things get done. There appears to be an order beneath, beyond, or just outside of human perception. Theories: Catastrophic Theory and Topological Theory explain rapid and gradual change.

We would now like to apply the above to society. It may appear a conundrum, but we would like to try relating Chaos Theory to the original Systems Theory popularized by many, but originating from Talbot Parsons in his *The Social System* (1950). In other words, systems or structure-functionalism, describes society in the most concrete, orderly way relative to other theories. Systems Theory has some difficulty explaining dissonance in a society. Thus, by describing this orderly paradigm with Chaos Theory, perhaps we can relate both Systems Theory and Chaos Theory. Parsons' view of society was that there were "system prerequisites" to the survival of a society. They are: goal attainment, goal adaptation, tension management, and integration.

Goal Attainment

Goal attainment means a society is able to produce goods and services to socially and economically survive and create social institutions to successfully create the conditions to insure socioeconomic activity prospers.

However, goal attainment is even more comprehensive. If things get done, the larger question is: Do families reproduce? Do schools adequately teach citizenry to be able to "get things done"?

Goal attainment looks at the instrumental functions of a society. All the institutions that directly or indirectly contribute to the productive function of the society, *so that it can survive*, are part of goal attainment.

Chaos Theory would suggest all the systems prerequisites are helpful social constructions in that they try to explain a messy world. Goal attainment is vast, as if there is a large tent over society and these four functions work their will. However, it is the authors' opinion the system prerequisites are very helpful, if overly rational and concrete. Another way of saying this is that Systems Theory rationalizes the disarray, as Chaos Theory clarifies it.

Goal Adaptation

Almost every society needs to change and, in the industrial and global information society, change is a constant. Goal adaptation seeks to explain the necessary change so that society can prosper. As of this writing, Japan, once the wonder of the world, is struggling to get out of debt. Relative to issues too complicated to discuss in this short article, Japan is having numerous difficulties changing. Systems Theory can chronicle various overt changes, but Chaos Theory can elucidate the flurry of activity that both promotes and resists change and all the activity that relates to the area, however tangential. Further, pattern maintenance is part of goal adaptation.

Tension Management

This euphemistic term attempts to explain riots, revolutions, crime, anomie and depression, class and racial struggle. Tension management includes all institutions that promote the

expressive dimension of social stability. Systems Theory is on balance, inherently order oriented. Thus, the claims of various outsiders to a system and working families are reduced, if nullified, in authoritarian systems. Tension management can include everything from prisons, psychiatric institutions (and medications), entertainment of all kinds and related activity. Systems Theory monitors overall stability, and Chaos Theory helps underline the messy activity of democracy and social movements of any ideology.

Integration

This area means that for a society to survive, all the parts of society (a social construction) must know what the other parts are doing. In early hunting and gathering societies, this task is highly adaptable and rather simplistic. As we now live in the *knowledge society*, high tech/electronic societies are increasingly vulnerable. The linkage in and among communications systems provides more conveniences and yet is more facile to sabotage, or to the vagaries of weather and dissident groups. As this communications continues from grass roots to electronic interaction, Systems Theory best explains overt activity. Chaos Theory helps to understand the incredible angst and disarray when communications break down. As this is being written, concerns about computer viruses illustrate both Systems Theory and Chaos Theory. Systems Theory can monitor the measurable distress, and Chaos can qualify the grassroots struggle of nations coming to terms with a computer glitch that has profound implications.

Pattern Maintenance

This is the last component. It deals with the ongoing reproduction of new members and the refurbishing of the social institutions. Systems Theory accounts for orderly change. Chaos Theory deals with the fits and starts of this change.

Conclusion

This has been a discussion of a revisit to Systems Theory and how Chaos Theory may compliment the former. Talbot Parsons' system prerequisites was discussed and used as a vehicle to explain the interplay between Systems Theory and Chaos Theory.

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Society and Social Problems

Joel C. Snell and Joseph P. Cangemi

Introduction

This chapter will present a paradigm to clarify that social problems appear to have an evolutionary path of definitions, strategies, and outcomes. Whatever the source, social problems emerge in both short term and sporadic ways and long term and institutional ways. Regardless of the source, configuration, strategies or outcomes, social problems do appear to have a common evolutionary characteristic of having a struggle over the *definition* of what is considered a problem, a *strategy or strategies* for some resolution or resistance to change, and a potential consensus about the *outcome* or resolution (if there is one). Further, this is an application of Chaos Theory, because it attempts to deal with disarray. It provides observations about social conflict, but not necessarily order or the origins of the social problem.

Paradigm

The authors of this chapter would like to make sense of all this by providing a paradigm that may clarify and render an easier observation of what is called a social problem. How there might be a consensus about a strategy or strategies to resolve the problem or let it be, and how elite and masses feel about the outcome. Further, we want to do this for both procedural democracies as well as authoritarian and totalitarian countries.

Democratic Bias

We believe that *social problems* textbooks do assume that the readers are American and that a procedural democratic model is provided. As an example, if one reads Kornblum and Julian (1998), the authors discuss the assumptions about a social problem on pages 14-16. Most have a democratic bias, and they should because most of the readers will live in a democratic society. In other words, in authoritarian and totalitarian states, numerous social problems do not exist because ideology and theology of the nation does not allow for their recognition. AIDS may be killing large numbers of people, but if ideology does not permit discussion of this issue, official reports will not include it. Or, if problems do exist, it is because of outside forces and these individuals creating these problems must be terminated or imprisoned. Thus, a problem is quickly resolved. This can apply to numerous other problems. Therefore, we want to make clear that the paradigm will include many societies including democratic and authoritarian nations.

This democratic thesis is also in Sullivan (1997). The author, on page 27, discusses three reasons why social problems should be discussed in an international context. None of the reasons take into account that a country will not acknowledge that the problem even exists if it makes ideology or theology vulnerable. The Heiner (1999) reader on social problems assumes, for the most part, a democratic bias. Thus, there are examples of social problems in authoritarian countries, but the strategies to "solve" these problems are democratic ones. Soroka and Bryjak (1999) do take into account where ideology and crime within an authoritarian country conflict. But in the main, there are democratic premises about "resolutions". This *as is* should be a given to the readership. We just want to maintain that social problems emerge around the world and we want to acknowledge it in our paradigm.

Other Paradigms

The area that we venture into is not new. Others have tried to simplify the process of social problem/strategy/outcome. Soroka and Bryjak (1999) suggested that social problems be perceived as tri-level phenomena. Kornblum and Julian (1998) provide a natural history of a cyclical model of a social condition becoming a social problem, giving rise to dissent and to the final stage of institutional legitimacy. This same natural history is in Horton, Leslie and Larson (1991). Sullivan (1997) provided a model from policy formation to closure. He also makes an insightful comment on "solving" problems that a significant majority do not want solved or do not want to pay for the "resolution." Mooney, Knox and Schacht (1997) suggested understanding a problem is the best non-model which includes a confluence of the three major sociological theories of conflict, functionalism, and interactionism.

Coleman and Cressey (1990) suggest a non-model of interpreting the claims that an issue is a social problem. Jones, Gallagher and McFalls (1998) suggested seeing a social problem as a synthesis and intermixture of objective and subjective dimensions. Curran and Renzetti (1993) suggested social problems are policy analysis of two dual paradigms: conflict and functionalism. Farley (1992) indicated a non-model of order and conflict not being incompatible. Feagin (1986) offered five propositions of critical-conflict sociology, the first of defining the problem in critical-conflict premises to the fifth, which is the downward drift to grass roots resolution.

Snell-Cangemi Paradigm

The authors would like to suggest a parsimonious paradigm. Its practical value is that practitioners, citizens, and academicians should be able to point to this table and indicate that this

is where the social problem is located at this time in its evolutionary path. At this point, the conflicting parties are given some clarity in the heated discussion of the problem. In other words, where are we in the evolution of this? In the quagmire or chaos of numerous voices, is there a path to indicate that there may be an outcome or a resolution? Or, if we discover that resolution is not possible, where are we if we should revisit it in a couple of years? The paradigm takes into account violent strategies, as well as peaceful ones; it also deals with democratic and other than democratic societies.

We understand that certain intelligentsia on the Right and what is left of the Left see that procedural democracies are really clever manipulations of the elite (however defined). Further, we understand that democracy and non-democracy, or other than democracy, is fraught with problems of definition. Other than for this scenario, which focuses on definition, strategy, and outcome, we understand the immense complexities of the definitions of democracy, republic, authoritarian state, and totalitarian society and we will let others argue about these differences and the validity of the terms just listed.

Further, the paradigm does not assume that one social problem exists in a vacuum, but is tied to many others. Additionally, we do not assume that any of the parties will like the outcome. It is possible that the resolution may have the latent function of making things worse than they already were. Nor does it assume any of the etiology of any one theory or theories. We assume that somehow and in some way (Chaos Theory), certain parties (elite, intelligentsia, or masses) or some other configuration when aroused seek a resolution or resolutions. We also assume that a resolution can give rise to other social problems or the initial debate can return in a restoration movement. If anything*, this is Chaos Theory*.

What the paradigm promises is clarity and simplicity in seeing the path of a problem, but not answers to any particular problem. Hopefully, when conflicting parties are in the midst of battle, cooler heads can say by pointing to the paradigm: *This is where we are*. The paradigm cannot tell the parties: *This is what we should do next*. We believe the value of this is that, many times, emotions are so heated that even knowing or having an idea about the present state of the social problems leaves conflicted parties a little less bewildered and less angry. Thus, we have *the paradigm.*

Snell-Cangemi Social Problems Paradigm

	GOAL	STRATEGY	OUTCOME
Agree	A	B	C
Disagree	D	E	F

ABC	Consensus Scenario	Present
DBC	Definition Scenario	Present
AEF	Strategies/Outcome Scenario	Present
ABF	Outcome Scenario	Present
DBF	Futurist Scenario	Future
AEF	Historic Scenario	Past
DEF	Struggle Scenario	Present

As one can see there are at least two options in the definition phase. We agree or we disagree. How do we determine those definitions? Polls, focus groups, assessment of interest groups and legislatures, or the wishes of a dictator or ruling elite are part of this process. It is more likely that we will disagree. However, agreement for whatever reason is probable or possible at strategic times in history. The definition is also called the goal. It may be that practitioners will begin to see the goal is really goals and thus each possible subset within the definition or goal has to be sectioned (or bifurcated) into another table and given a priority. We do not have the time in this short article to dwell further into this area. However, the subsets may help give clarity to defining the problems.

All of the above remarks apply to strategy, outcome, or resolution. We also want to note that there are unusual periods in history when there is near unanimity relative to a social problem, however unlikely that seems. Additionally, we want to note that if there is a resolution, it may quite likely give rise to other problems in other areas of society. Reality appears to be chaotic with an underlying order. All of this, however, we leave others to argue.

Scenarios

A. Consensus Scenario
Scenario 1: agree/agree/agree
(A-B-C)

Definition: This is probably the best of all worlds and the worst. In the utopian version, the totality of the definition finds few that dissent with the goal, strategy, or outcome.

Example: A natural disaster. One may argue about safety precautions, but on the whole, the phenomena are so overwhelming there is general agreement in all three areas. On the other hand, for some other social problems, it could be that large majorities of the population perceive a problem, recognize a strategy or strategies, and have a vision of an outcome or resolution; but a powerful force at the top opposes even the recognition the social problem exists in dictatorial societies. In procedural democracies, it is possible that powerful lobbies or the elite can, through numerous manipulations, give the appearance nothing can be done or is not worth doing, or something was done when, in fact, little has changed. One should read this for democratic societies as something most agree upon. It is to the benefit of most parties and the outcome or resolution is thought to be acceptable. This is a likely scenario, and is considered to be a social problem.

B. Definition Scenario
Scenario 2: disagree/agree/agree
(D-B-C)

Definition: Now we approach something like everyday reality. In procedural democracies we disagree that there is a problem. However, if there is a strategic moment in time when a confluence of events occurs, it is possible (if not probable) that we can move to a strategy or strategies, and we think that the outcome is desirable.

Example: In the case of Health Care, we may disagree about universal versus fee paid medicine, but we will probably find that in terms of strategy, we want board certified medical practitioners to perform the tasks and we want the public to be “healthy” because of the procedures of the practitioners. In non-democracies, the elite may disagree about who shall have medical coverage, but the official ideology indicates that talented medical practitioners cover all. This is a likely scenario.

C. Strategies/Outcome Scenario
Scenario 3: agree/disagree/disagree

(A-E-F)

Definition: Here again is a likely scenario in a procedural democracy. We agree there is street crime and we want citizens to feel safe in their homes and public places; however, we disagree about what to do with the offenders (strategy) and what will be the likely outcome.

Example: There appears to be some consensus about incarceration, but what to do about drug users (not major dealers), and what is the outcome is not "settled". It may be that it becomes so costly to incarcerate non-violent offenders (we will leave that definition for another time) that there becomes some resolution about strategy and outcome. There is also the question of those who are so very old or so very physically ill that they appear relatively less likely to commit another crime. In non-democracies, policies come from the top and changes are announced as if an adjustment was necessary to an already workable system. In the meantime, there is yet to be an agreement on strategy or outcome.

D. Outcome Scenario
Scenario 4: agree/agree/disagree
(A-B-F)

Definition: This is a very likely scenario. We thought we had the problem clearly defined and thought the strategy would work, and it did not. However, we are divided about the outcome.

Example: This could apply to early drug awareness programs. We thought it would save so many from the despair of hard drugs and alcohol. It appears it has not worked as well as we wanted, or the outcome is arguable. However, we understand numerous pathologies are linked with alcohol and other recreational drugs, and the restrictions of alcohol and other drugs are subject to debate. In a non-democracy, the initial solution is revised but rarely completely rescinded if it violates ideology or theology. In some countries, alcoholism and drug abuse do not exist because those with a problem are exported.

E. Futurist Scenario
Scenario 5: disagree/agree/disagree
(D-B-F)

Definition: This is not unusual. We disagree there is a problem, and we do not like or guess the outcome, because we do not agree there is a problem in the first place. All we do know is we may share a democratic strategy in its resolution.

Example: This scenario is for the future. It is a social problem that is not even a social condition (a problem waiting for the limelight of attention). We are not worried about it now in democracies or non-democracies. An example may be an everyday activity that is considered normal until a future activist defines it, by giving it a name. Some become "conscious of kind" or aware that they are or think they are a victimized group, and scenario 5 transforms into another scenario.

F. Historic Scenario
Scenario 6: agree/disagree/agree
(A-E-F*)*

Definition: This is very likely. We agree on the problem and we liked the outcome, but we muddled and/or struggled through the strategy.

Example: This may be history. It is a settled social problem and we can revisit it in documentaries and textbooks. A good example may be the slavery of African-Americans. There is still a minority who support slavery, but the overwhelming majority reject it. We fought a civil war over it and it now appears to be gone. Social problems textbooks refer to it in the past tense.

A settled social problem in non-democracies, they celebrate it in their history books only if it honors theology and ideology.

G. Struggle Scenario
Scenario 7: disagree/disagree/disagree
(D-E-F*)*

Definition: This is a likely scenario. All compromise, negotiation, and democratic strategies break down.

Example: Thus, some form of war emerges. Regardless of the label or form, violence is now acceptable. This means suffering, dismemberment, and killing is now thought to be the choice of last resort. It may be done reluctantly or with celebration, but it is still carried out. It is a likely scenario that is sometimes called civil war, insurgency, rebellion, and related. This example applies equally to democratic and non-democratic societies.

Observations

We believe that the Snell-Cangemi Social Problems Paradigm takes into account the following:

1. The three major theories found in most social science disciplines dealing with conflict, equilibrium, and meaning,
2. Past, present and future,
3. Peace and war scenarios,
4. Democratic and other than democratic societies,
5. Chaotic variations among peaceful disagreements.

Conclusion

We have presented a paradigm that looks at options based on definition, strategy, and outcome with seven scenarios or alternatives. Two of the scenarios deal with contemporary consensus and struggle, two involve the past and the future, and the other three are variations around the three stages of variation, strategy, and outcome in the present. The paradigm is useful for providing clarity about the evolution and possible resolution of a social problem. It is part of chaos theory, because it does not assume linearity, origin, or outcome in an orderly way.

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III. Mid-Range Society

Chaos Theory and Management

Joel C. Snell and Joseph P. Cangemi

Introduction

In previous articles, the authors described some of the basic components of Chaos Theory. Briefly, Chaos Theory attempts to explain human behavior as appearing chaotic, disorganized, and undirected. It has numerous components, but the premise is: beyond, beneath, or above the fray, there is an underlying order. We also stated sometimes disorder is to be found and that intervention is necessary. We suggested order might be natural, social, or even cosmic, but we do not want to sully the theory with extra baggage this early in the evolution of the academic trajectory of social thought. Further, we also tried to distance chaos theory with other emerging phenomena like post modernism and the like. Additionally, we described two other secondary theories. Topological Theory attempts to account for gradual change and Catastrophic Theory may help illustrate rapid change.

Management

In this article we would like to apply the theory to management. We would like to use a relative established model to introduce Chaos Theory. However, we do not necessarily endorse the model. We use it as a vehicle to discuss Chaos Theory. The management model is the Blake-Mouton Managerial Grid (Blake and Mouton, 1985). It is a model based on two criteria, the instrumental axis is concerned with production and the expressive axis relates to morale. Thus, a highly effective organization is both productive and has employees relatively happy with their work.

Grid: 9/9

The model uses the upper positive quartile of a Cartesian plane. The numbers supposedly have ratio qualities and the span of numbers is 1 through 9. A 1/1 organization in common parlance is a very poorly run enterprise, and a 9/9 is an ideal or near ideal formal association.

How does Chaos Theory apply to a 9/9 *Team Management* organization? First, the organization is not micromanaged. Employees and middle management are given goals, but the workers in part determine the process. In this instance, chaos of sorts is assumed. Second, upper

management is continually monitoring both internal production and external markets. Finally, chaos is assumed in that even the best run systems can be destroyed or atrophied if the management team fails to change appropriately in an ever-changing world.

Thus, trend line projections *what work now* will work in the future, regardless of the task, is a wrong assumption for Chaos Theory. Wild cards and other unpredictable events may even destroy the organization. Additionally, the market may change so dramatically that even the best-run business, farm, or other formal association can no longer survive. Thus the assumed unseen order that *giveth* can also *taketh away* from even the best-reasoned endeavors.

Grid: 1/1

In this situation, entitled *Impoverish Management*, the reader may wonder how the organization stays alive. In terms of chaos, temporary life of systems may be based on an order interrupted by human intervention. The system may be a company headed by a marginal member of a prominent family that uses the company or agency as a way to distribute the federal or state largess to local constituents. However, if the unseen order works its will, the organization will quickly die, once the favored status is lost.

Grid: 9/1

Called the *Authority-Obedience*, this model is probably an historic model that is still prevalent today. If an organization does not have a social charter or collective bargaining, and training of new workers is relatively short, this model prospers. Employees may come from an area where other work opportunities are sparse, and imperfect competition prevails. The CEO is a bully and can continue this behavior because there are no other attractive alternatives available to workers. If workers do complain, the local police may come in to stop the protest. Chaos suggests that if the unseen order is to prevail, a competing firm with better work conditions can succeed.

However, human intervention may squash the market mechanism, or order is based on submission. Many parts of the world lives in poverty and under military governments. We tried to avoid the appendages described at the beginning, because we do not want to assume this order is benevolent. It may be, but not in this existence. We will leave that debate to others.

Grid: 1/9

In reverse fashion, *Country Club* management can survive in a market where prosperity is so great management can afford to treat its workers in a leisurely fashion; or the company has so much of the marketplace for so many years the employees are treated royally. Chaos Theory suggests this organization, although ideal, is subject to the vagaries of order. The personnel department, at one time a joy to work for, can become the department that ends the careers of numerous talented and well-meaning people who played by the rules only to be punished for doing so. In other words, it is now cheaper to out-source jobs to organizations that are run by bully (9/1) CEOs. Profits are greater, and the investors are happier. Soon, there is a collapse in cascading order of numerous organizations dying and pushing wages downward. The order appears to support contract work, low wages, and no benefits.

Grid: 5/5

Called *Organization Management,* both production and morale are “adequate”. Chaos Theory suggests this organization is as vulnerable to change as are other management strategies. For whatever reason, such as market location, type of competition, or source of funding, this organization survives.

Chaos Theory Revisited

It would appear that the winners in the scheme of things of which some type of order is assumed, the 9/1 and 9/9 appear to be the most adaptable. If a worker has a choice, she or he

would want to work in a 9/9 organization. They become loyal to it and seek out remedies beneficial to the organization if problems arise. 9/1 does not engender loyalty because it does not have to. Workers are treated poorly and turnover is great, because the prevailing system is profitable. Working with the government, new competition is quickly or quietly undermined. Churches, schools, and other voluntary organizations are recruited to help socialize workers to endure or enjoy the harsh working conditions.

Chaos Theory's major contribution may be the type of management, in various forms, of capitalism. As this is being written, command socialism and democratic socialism are thought to be dying because the system cannot compete in a global order where capital can move almost anywhere and labor cannot. There is a new socialism emerging based entirely on income policies and a private economy. Many democratic countries are also social democracies. Thus, there is a mixed economy with a vital private sector and a public sector to provide a safety net. Whatever the order beneath chaos, adaptable ever-changing organizations appear to be those that survive. The next question is one that deals with capitalism. Does capitalism naturally deconstruct into competitive organizations continuously? Or does it naturally evolve into oligarchies and monopolies? We will leave that argument and other related ones to others. Chaos attempts to explain the disarray that appears within and among competition of various organizations.

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Chaos Theory and the Stock Market

Joel C. Snell and Saul Mekies

Williams' book *Trading Chaos* suggests the market will follow up and down fractals that appear to form a wave or cycle in business. Whatever happens between fractals is the Elliot Wave theory (trading-stocks.com/fractals). This discussion is of little use to consumers and others not conversant with Chaos Theory.

Therefore, in common parlance, random shocks occur in the market and give the appearance that the market is a scary, disorderly place. Thus, it is chaotic. However, over time, the market appears to have an order to it that forms waves over decades.

Some believe this originates from Fibonacci's series of numbers (tradingstocks.netfirms.com/elliot-wave) of five distinct upside and distinct downside movements. The eight cycles are given titles. The movements last decades.

Chatterjee (2000) hypothesizes an orderly pendulum-like wave should be replaced with shocks. Although there appears to be a long-range order to the market, outward continuity is a misnomer and a math generated series is also inappropriate. The key is residuals or random shocks. Further, the residual is so random, trying to describe and quantify that, which causes it, appears daunting.

Holleman (2001) suggests that sociological, political, and psychological, as well as economic, features best describe a 50-60 year cycle of punctuated equilibrium. The "great eight" stages are triggered by wars, technological innovation, monetary contraction, speculation and excess, ending with liquidation.

Meadows and Donelly (1998) observe economic waves that trigger chaotic shocks follow an outwardly appearing order that also ignites or correlates with the political climate. That a long wave is observable by computer monitored wages and production values. In the end, counter-cyclic measures make the most sense in the long wave and the least sense to the political classes.

Colvin (2000) sees any kind of wave theory as folly, because practitioners reify or anthropomorphize events, believing that history exactly repeats itself.

Insana (2002) makes a practical case of what to do with the disorder inherent in the outwardly appearing orderly waves. History appears to repeat it self in an inexact fashion.

Investors become time-centric and an order beneath the chaotic buying suggests that consciousness is blurred and distorted by bubbles and economic mania. The main feature of the market is "experts" begin to deny the business cycle. Non-cognitive factors blur the perception of the market. When experts and investors will no longer listen to signals of chaos and crashes, the cycle reasserts itself. The *business cycle* is supreme. Production nearly always lags behind consumption; excess emerges. The stock market falls. Chaos reasserts itself.

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IV. Micro-Level Society

Chaos Theory and the Individual

Joel C. Snell

Chaos Theory and the Individual

Joel C. Snell

Introduction

In previous articles, the authors have described Chaos Theory and its application to numerous topics. Chaos Theory essentially states that behavior appears messy and in disarray when in fact, outside the naked eye, behavior and surrounding reality appears to have an order. Secondary theories of Catastrophic and Topological Theory suggest the messy reality the perceiver believes to see can be abrupt or gradual in terms of change.

Chaos Theory has been applied (by the authors) to real world examples, social problems, formal associations, and society. In this article, the authors choose to apply it to the individual. At the end of this article, in a number of ways, we will have applied chaos to micro/midrange/macro

topics. We also would like to suggest this is only the beginning. We expect that numerous refinements and reflections will clarify the theory in the years to come.

At the individual level, we use as a hypothetical model Erik Erikson's *Childhood and Society* (1963). We do not say that this is the *only* developmental model, rather again we are using a relatively known, if partly flawed, model to demonstrate the impact of Chaos Theory on individual development. Erikson's model is a typical addition to numerous textbook editions of psychology and sociology. The model suggests there are a number of stages each individual must resolve to live his/her life. Most authors caution that these are universal themes subject to Occidental cultures. Additionally, Erikson does indicate the downside of these stages. We do want to caution that these stages do not automatically suggest a suburban model of lifestyle. Nor does it assume child rearing ends as early as one surmises. It is not unusual for adult children to come back home to live again because they have been downsized from their job. Further, war, pestilence and all the age-old maladies can impact on this model and that is the focus of our paper - *chaos*.

Trust vs. Mistrust

Chaos Theory would suggest that on balance, most children will somehow get the trust needed, but it will be flawed; and that genetics, the physical attractiveness and disposition of the child, the number of children in the household, the location of the child among siblings, the age and social class of the parents, the use of the extended family, the quality time issue and numerous other variables will sully this model.

Autonomy vs. Shame & Doubt

Most children will probably learn to try new skills, but may be troubled by sexual abuse, religious zealotry of parents or overindulgence. Further, the subculture in which the child "prospers" may be troubled by the usual social pathologies encountered in third world countries such as severe nutrition, poverty, and possible incest. Chaos Theory can compliment this area.

Initiative vs. Guilt

Children over the world will learn play, questioning and imagination. This can be troubled by the numerous parental, sibling and other variables that flaw human beings. It may take anti-depressants, tranquilizers, and cognitive therapy to compensate or revisit this stage to move on to the next stage. Chaos suggests that even "perfect" parenting can be compromised by genetics and neighborhood variables.

Industry vs. Inferiority

It is at this time productivity takes a leap upward, unless accompanied by the larger world the child can enter when he/she encounters school. Chaos suggests that the "hidden curriculum" (those variables at school that can damage an individual) come into play. However, most become resilient and industrious. Resilience is less likely in poor neighborhoods.

Identity vs. Role Confusion

Ideally, the individual comes to know who they are, but Chaos Theory would suggest constant change of the global information society would facilitate role confusion. Tribal societies may encourage "I am who?" to the ever fluctuating "Who am I?" Ever moving societies create temptations and doubts as well as opportunities that can facilitate role confusion. Additionally, the electronic media brings about the early and easy location of all kinds of behavior that can appear to youngsters as equally legitimate. And yet, as Chaos Theory would suggest, most individuals discover who they are and stay within certain boundaries that Harry Stack Sullivan identified as "me" and "not me".

Intimacy vs. Isolation

Can one learn to trust? Chaos Theory would suggest the ever changing/fluctuating observable reality will strongly encourage an order to self by relating emotionally to significant others.

Generativity vs. Stagnation

If there is an order to the emergence of *self*, generativity may endure because individuals are exposed to a messy reality that demands an order to *self* to survive.

Integrity vs. Despair

Can self-respect transcend remorse? Chaos Theory would suggest most people could search for a higher power for past untoward activity, atone for general remorse, and (with mellowing) finally forgive themselves. In other words, Chaos Theory would suggest even in the most turbulent world, the individual struggles for order in the self.

Conclusion

This has been a discussion of Chaos Theory and the individual as postulated by Erik Erikson. The authors raised questions relative to how the "neat" model listed above is compromised by the reality of a constantly changing world filled with abuse, war, poverty, injustice, and numerous other family and neighborhood variables. We suggest some may never completely get out of one stage or may skip a stage and then revisit it through therapy.

In the wider scheme of things, humans construct reality and models to better understand it. However, the stages listed above can be thought of as hypothetical models or Weberian "ideal types". They are useful for inquiry, but may not endure verification as neatly as one would want over time.

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V. Measuring Chaos

Utilizing Chaos Theory and Statistics: A Commentary

Joel C. Snell and Mitchell Marsh

Chaos Theory? Meta-Cognitive Analysis: an Alternative to Literature Reviews and Meta-Analysis for the Sciences and the Arts

Joel C. Snell and Mitchell Marsh

Utilizing Chaos Theory and Statistics: A Commentary

Joel C. Snell and Mitchell Marsh

Introduction

Earlier publications (Snell et. al. 1999; Cangemi et. al., 1999) suggested that Chaos Theory is the science of disorder, and that many models now useful and acceptable attempt to put order to social life and society (the equilibrium model, the struggle model, and the meaning model). In secondary fashion, statistics attempts quantitatively to provide order to numbers generated by these order models. Thus, elementary statistics provides the researcher with answers to such questions as: "What is going on in the middle of the numbers that have been aggregated and ranked? How do numbers disperse from the middle? Do one or more groups' numbers significantly differ by chance from another set of numbers of another group? Do some variables' numbers better 'explain' variance of another variable when ordered in multiple regression?"

Discussion

Is Chaos Theory amenable to these statistics? We suggest that the field is so new that our best guess is *probably not*. However, we do want to suggest some statistics that may be of value.

Descriptive Statistics

We would like to suggest "streaming descriptors" might be helpful. Like the streaming video of the Internet, "streaming descriptors" provide short-term descriptions that disorder encourages. Thus, fractals bifurcate and, after the work of the fractal in relationship to attractors form a phase portrait, a snapshot can be taken by placing a numbered integer on the phase portrait before a new iteration takes place. The "settling down" is the phase portrait. Numbers are generated by a value system implicit in the research design. If anything, the streaming descriptors may indicate volatility. Thus, at times, movements in and among the fractals generate more nominal numbers than at other times.

Chi-Square

Chi-square may be useful in establishing if movement in one phase portrait is significantly greater than at another time. Chi-square is useful because as a goodness of fit, it is nominal and the most cautious form of comparison.

Conclusion

The science of disorder may not be amenable to research statistics that try to bring order to non-linear/non-orderly behavior. However, if any statistics are useful, we suggest that the streaming descriptors and chi-square may be of value.

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Chaos Theory?
Meta-cognitive Analysis: An Alternative to Literature Reviews and Meta-Analysis for the Sciences and the Arts

Joel C. Snell and Mitchell Marsh

Introduction

The authors will introduce a new method of analysis that combines qualitative and quantitative methods to help researchers analyze data when they do not have national random samples.

Review

Glass noted in his "Meta-analysis at 25" that he could not believe the success that his statistical method had, and the number of entries on the Internet that use Meta-analysis (Glass.ed.asu.edu/gene/papers/meta25. html). His original idea was to question Eysinck's literature review on psychotherapy. Glass found inner peace with therapy while Eysinck indicated the whole talk therapy issue a fraud or a placebo. Glass reviewed the same studies and others and aggregated the numbers in the direction of successful outcomes and those that found no difference. To control for bias, due to larger numbers in some samples as opposed to others, he was able to homogenize the data by using measures of central tendency over variance. Thus means were compared with the two groups and were divided by the means of the standard deviations or, in academic jargon, he randomized the data and used a "t" or "f" test (depending on the number of studies.)

The whole procedure was an incredible success. As most researchers know, purposive samples are often drawn because the researcher cannot afford to sample the entire nation.

Corporations and political parties can do so, but individual researchers do not have that kind of money. Thus, samples are drawn from available samples (purposive sampling) and are not random. Non-random samples are used both in experimental and control samples with matching demographics and a goodness of fit test used to ascertain if there is a difference at the .05 level of confidence. Another strategy uses a large purposive sample and cross sectional design of analyzing the "with-in difference" between two demographics or psychographics. Both assume "as if" there is a large randomized national population. A third strategy is to draw a random sample from a school, city, or target area and assume "as if" it is a large randomized national sample. All the examples listed above are flawed, but very useful.

Glass takes this a step further by aggregating *all* studies and uses significance testing for differences or lack thereof. In other words, he quantified literature reviews. To individuals with little monies, one can contact the reference librarian and get, over time, a number of studies on a particular topic, quantify them, run a significance test, and publish the findings. In 25 years, Glass notes how much the strategy has been used.

Further incarnations by others have used statistical manipulations to further randomize the data, and some have stratified it by using only the best studies and those with the most transparent findings that can be manipulated (Ibid.). Thus, where original studies had double-digit samples, Meta-analysis could provide thousands of individuals. Further, various controls, different stimuli, various measures of outcomes were leveled into a single set of numbers to analyze by a "t" test. Last, all studies that may have had nominal or ordinal qualities were treated as interval or ratio data and hard number theory were assumed. Meta-analysis gave individual researchers with little or no grant money a chance to compete with large research institutions.

Glass defended his method with exuberance, but did admit that Meta-analysis was not as robust as a large national random sample. He indicated, "Moreover, the typical Meta-analysis virtually never meets the condition of probabilistic sampling of a population." (Ibid.) To make this clearer to some, in a national presidential election Meta-analysis would take all the candidates primary wins and losses, aggregate and randomize them and predict the winner. On the other hand, the two major political parties would have a large random sample that would keep interviewing and continuously sample up to Election Day. In other words, Meta-analysis is now a legitimate tool in research analysis but is not superior or equivalent to a national random sample.

There are numerous criticism of Meta-analysis that deal with the lack of randomness, the leveling of research procedures, and related issues. This is where we would like to introduce a new research strategy that may be applicable to the hard sciences, soft sciences and the arts. Our position prior to this presentation is that randomized samples take precedence over Meta-analysis and if the researcher wants to use Meta-analysis, we support that alternative. However, if the academician is uneasy with Meta-analysis, we suggest a less robust but more defensible method. We call it Meta-cognitive analysis. It is another strategy that quantifies literature reviews.

Methodology

Meta-cognitive analysis recognizes that, in the literature review on a particular topic, 1. Numerous samples of varying randomness will be used, 2. Various research designs will be maintained, 3. Different statistical tests will be used, 4. Outcomes will be reported differently. However, the results will be cognitively assessed as in content analysis.

In our procedure, we first look to see if there is any particular bias or prejudice. If so, we stratify and leave them out. Second, if a study is methodologically flawed but some how gets published, we do not include the study. Third, some studies have no difference in their findings and are published in less prestigious journals; we most surely want to report those findings.

Thus, step 1 is to use that which are, to the best of our knowledge, legitimate, defensible studies. Step 2, we look cognitively at the outcomes, rather than in Meta-analysis the numbers. Thus, if there are differences we place them in one cell (the upper left hand) of a 2 x 2 table. Step 3, if no differences are discovered they are placed in the upper right hand corner. In step 4, all the studies from literature review are added and divided by two.

As examples, if there are 40 studies, the bottom left hand cell will have 20 and the bottom right will have 20. The bottom 2 cells represent chance (based on simple probability, not sequential probability.)

Let's take a placebo study. An antidepressant that is given to one group with similar demographics and psychographics and a placebo is given to a like group. The first upper two cells indicate when antidepressants are used; 30 studies indicate the medication works "better" than the placebo. In the upper right hand corner, 10 studies indicate that there were no differences between the antidepressant and the placebo. The bottom two cells contain half of the total. Thus, 20 goes in the bottom left hand and 20 go in the bottom right hand. Do not use percentages or relative numbers. If any cell has less than 5, we will use Fischer's correction, as we are going to use the Chi-square test of significance.

Chi-square is essentially a nominal test. Thus, nuances and discretion afforded by more robust, hard number oriented analysis used in Meta-analysis is lost. On the other hand, the leveling and homogenizing data are suspect to some researchers who question it. Meta analysis is not a salient issue in our method.

In our example, when we are comparing the efficacy of a particular antidepressant, we calculate by using a Chi-square formula found in any elementary statistics books. It is: *X2= sum (observed-expected) squared/expected*.

In this instance, the antidepressant is "better" than the placebo. How much "better" and to how many people? We don't claim to know. That is the genius of this strategy. It is a quantifiable process with strongly qualitative aspects. It is a very humbling procedure and can use numbers in

a qualitative interpretation of a literature review. Further, we are not opposed to using strictly soft numbers and reporting that 30 studies found a difference in the direction of the antidepressant and 10 found no difference.

The Arts and Humanities

Let's now move to the arts and humanities, using the same 40 cases indicated above.

Let's assume that 30 scholars see the beginning of the civil war (on balance) as an economic struggle between the agrarian south and the industrial north. On the other hand, 10 scholars see the Civil War as a struggle on balance over the issue of slavery. We then conduct the same identical test, 30 in the upper left hand as an economic struggle and 10 in the upper right hand as slavery issue. The bottoms 2 squares both have 20 each. We then calculate Chi-square. Historians will be the first to note the Civil War was about something else or there is a mix of issues. We agree. That is why a qualitative analysis or literature review must come first. Further, Chi-square can provide a 3 x 2 table for other or mixed results. However, unlike Meta-analysis, the nuances of history are described previous to the significance testing and it is done in a qualitative way through the use of words rather than numbers.

For the arts, a particular piece of poetry, art, or literature is first reviewed in terms of shadings and nuances of various experts or jury referees. Their findings are described in qualitative ways. All the virtues of the arts are on display. The panel judges the interplay of idiosyncrasies that make one piece of art qualitatively different and perhaps superior. And, not all panel members are equal. Chi-square can take that into account, but cannot do so without a doubling of the weight of a particular panel member. This weighting is very subjective, but permissible.

Thus, a panel reviews a new poem; 30 members find it (on balance) a great work of art, the other 10 find it not very favorable. The researcher or researchers can make that qualitative judgment combined with a quantitative analysis. This procedure can also be used for popular culture.

The Physical Sciences

The hard physical sciences may need this the least, but it is still usable. In the literature review a particular topic is analyzed. A hard physical science researcher without the benefit of a lab and considerable money to run it may find Meta-cognitive analysis useful by aggregating the literature review in terms of differences versus no difference. Thus, the researcher may find a publishable article and a new insight into physical phenomena.

Summary and Conclusion

The authors have reviewed three previous strategies to assess viability of a finding in the natural world. The first is a literature review, the second is Meta-analysis, and the third is to draw a random national sample and test an hypothesis. We suggest a fourth strategy. We call it Meta-cognitive analysis. It may be equivalent to literature review and Meta-analysis, but inferior to random sampling/hypothesis testing. Our strategy is to quantify literature reviews in a more humble, but more defensible way. We collapse literature reviews into difference versus no differences, or favorable/other than favorable responses. We then test this relative to chance with a Chi-square test and assume "as if" we have a random national sample.

Meta-cognitive analysis may apply to the arts and humanities, social sciences, and the hard physical sciences. Thus, it is applicable to Chaos Theory. In terms of findings, the strategy levels the playing field for those without large grant money and research teams to gather original data and test hypothesis. We believe our strategy is less robust than original sampling, but may be equivalent to literature reviews and Meta-analysis in terms of defining a problem and is superior to Meta-analysis in that we do not level strategies, numbers, and classifications and related.

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VI. Chaos Theory – Final Observations/Conclusion

Joel C. Snell and Joseph P. Cangemi

About The Authors

Chaos Theory – Conclusion

Joel C. Snell and Joseph P. Cangemi

Chaos Theory

Chaos Theory, as stated previously, is new to the social sciences, but is really much older when viewed from the hard sciences. Chaos Theory came to the social sciences in the 1970s, but not much was known about it until recently. Unfortunately, it is still rather new to many academics and practitioners in the social sciences.

Chaos Theory is the study of disorder and disarray. It means that, to the naked eye, much of the world looks disorderly, but that beneath this chaos is an order; most things do get accomplished. There is also a creative destruction of places and spaces that have outlived their usefulness in this order – difficult to uncover initially. Old and new become blurred. Some insights are rediscovered to be useful hundreds of years later. Two competing fields may discover that they are really studying the same thing, but are using different nomenclature.

Catastrophic Chaos Theory

Chaos Theory deals with tipping points and how individuals reach a space or place where marked changes are called for. The catastrophic fold is the term that can ignite what appears to be revolutionary change.

Topological Chaos Theory

Topological Theory deals with a Mobius band that acts as a metaphor to mean that change is evolutionary, slow, and cautious. Over time, individuals, groups and cultures change very subtly to the point we know things are changing, but not as rapidly as we might think. Thus, order emerges out of disorder.

Conclusion

The social sciences have been dominated by functionalism or systems theory (an equilibrium model), symbolic interactionism (a meaning model), and conflict or critical theory (a

struggle model). Although these three main theories have been extremely useful and continue to be so, we believe that they can be complemented by the Chaos Theories. Although they can probably be cross-linked and intertwined, we suggest that Chaos Theory is more likely to complement systems or functionalist theory, Catastrophic supporting Conflict Theory, and Topological Theory enhancing meaning theories. The authors want not only to crossbreed the theories but also to encourage research, analysis, and further inquiry into the reality we believe that we live in.

Final Observations of Chaos Theory

1. Chaos Theory is a rather new addition to the social sciences. If it holds up and makes wider application to the social sciences, the theory would suggest that research paradigms and theory itself is more descriptive than predictive. A chaotic micro-trigger can have larger influences on human behavior than once thought. Deterministic models were generally thought of as more suggestive than hard line prediction. If chaos theory does not hold up, then hard line ratio number prediction will survive. It may be, in the future, if Chaos Theory continues to prove valid and helpful, triangulation of research strategies will be the best way to pursue the knowledge of human behavior.

2. This would also suggest correlation is generally a better word to use than causation, when it comes to human behavior.

3. Further, less robust measures are more nominal in orientation, as an example chi-square rather than robust ratio oriented multiple regressions may be used. Or, even better, given there is a large enough sample, the authors may want to present their findings in both multiple regression and in multi-tabular Chi-square tables. Thus, Chaos Theory is assumed with the less robust Chi-square. However, the authors of various new studies will give the readers a combination of presentations that will include the randomness of Chaos Theory. Chi-square may be less strong, but is comprehensive enough compared to multiple regressions. The less discrete measure is more likely to involve erratic activity of multiple micro-triggers. Path analysis may become suspect.

4. Chaos Theory is not directly related to post-modernism. The science of the Holy Spirit, Suchness, or Wu is still not a hard science, because no one knows when the next micro-trigger will emerge or, in Topological Chaos, how the entire model gradually changes. It is probably post-modern, but it is not necessarily new age. If Chaos Theory continues to prosper, many other “questionable” and “other” theories may emerge that really do not have any direct relationship to chaos Theory. However, they may claim a relationship.

5. Words like unintended consequences, wild cards, perfect storms, surprises, upsets, conundrums, magic moments, puzzles and related may or may not denote Chaos Theory. However, the words may suggest that chaos is at work.

6. Although chaos has at least three sub-models (Chaos/Topological Chaos/Catastrophic Chaos) this does not mean that other social change models are not useful and valid.

7. Chaos Theory will also have to look at multiple stimuli. It is very likely that micro-triggers will give rise to numerous other triggers, that gives rise to millions of other triggers, so that ongoing change is everlasting. Most linear deterministic models take snapshots or longitudinal snapshots of reality. We would suggest the metaphor of some computer videos of stuttering, streaming and shifting pictures that are even more longitudinal than snapshots,

but not quite that of a "moving" motion picture. However, that is the ultimate goal of Chaos Theory. It is the capturing of movement in real time.

8. Chaos is suggested by some as one of the great discoveries of the 20th century that is in the same league with the likes of Quantum Theory and Theory of Relativity. For the social sciences, we suggest the theory is more sublimentary and will complement but not replace the three major theories of equilibrium, conflict and meaning.

9. Chaos Theory will demand all the social sciences may want to rethink the word "science". In other words, *social methodologies* may replace the term *social sciences*, because chaos reminds the observer of the softness of predictions and interpretations.

10. Chaos Theory will, hopefully, become common knowledge to students who take courses in the social sciences in the years ahead. This little book of essays is to reinforce the idea chaos should be with us for a long, long time.

About the Authors

Joel Charles Snell

Joel Charles Snell is a professor of social sciences at Kirkwood College in Cedar Rapids, Iowa, since 1990. He has a B.A. in Sociology (Psychology) from the Municipal University of Omaha, M.A. in Sociology (Psychology) from the University of Nebraska at Omaha, and Ph.D. Studies in Sociology (Counseling Psychology) from South Dakota State University. He has taught many courses including General Sociology, Criminology, Social Problems, Medical Sociology, Juvenile Delinquency, Concepts in Social Sciences, Liberal Arts Orientation, Sociology of Aging, Sociological Imagination, and Anytime/Anywhere Distance Learning courses. He also taught at the University of Omaha, and ten years at Dana College.

Professor Snell is a Research Fellow with the Arlington Institute in Washington, D.C., since 1991. The institute is a "think tank" that deals with alternative future scenarios. The CEO is John L. Peterson, the former Military Strategist for the 1988 presidential candidate Michael Dukakis and former Vice President of the United States Al Gore.

Professor Snell has been a member of the Editorial Board or a Reviewer for the following publications: *The Annals of American Academy of Political and Social Sciences*, *Psychology- A Journal of Human Behavior*, *Journal of Criminal Justice Education*, *Southeastern Political Review*, and *Focus: Social Science Journal*.

Professor Snell is the author and co-author of over 500 articles. He is co-author of nearly one million dollars in research and institutional grants from the Department of Education, the National Endowment for the Humanities, the U.S. Army Corps of Engineers, Law Enforcement Assistant Agencies, and the U.S. Department of Labor and Options of Brown University.

As a Sociologist Futurist for the U.S. Army Corps of Engineers in 1975, Urban Studies Branch in Omaha, Nebraska, Professor Snell was involved in transportation analysis, recreation

cost/benefit analysis, soil analysis, social ecological studies, social geography, and technical writing. Professor Snell wrote the first man-to-land analysis for the entire corps. While a research consultant LEAA Criminal Justice Studies for the Department of Criminal Justice in 1975, at the University of Omaha in Omaha, Nebraska, Professor Snell wrote or co-wrote articles, monographs, and technical reports pertaining to criminal justice along with Dr. Vince Webb, Dr. Dennis Hoffman, Dr. Sam Walker and Dr. Bill Wakefield.

Joseph Peter Cangemi

Dr. Joseph Peter Cangemi attended the State University of New York at Oswego for his undergraduate preparation (recipient of the *Distinguished Alumnus Award*, 1983), then went on to receive a Master's Degree from Syracuse University and a doctorate from Indiana University. In 1996 he received an honorary doctorate (LLD) from William Woods University in Fulton, Missouri and in 2001, sponsored by the Russian Academy of Sciences, he was awarded a DHC (*Doctorate Honoris Causa*), an honorary doctorate from Moscow State University of Humanities in Moscow, Russia.

He is author or co-author of 16 books and monographs, over 300 papers and published articles, and presently serves as executive editor of *Psychology and Education – An Interdisciplinary Journal.* He was editor of *Journal of Human Behavior and Learning* and *Organization Development Journal* from 1983 to 1988. Dr. Cangemi has been a member of the Psychology Department at Western Kentucky University since 1968. In 1979, 1991 and 1999 he received the *Excellence in Productive Teaching Award* and in 1987 the *Excellence in Research/Creativity Award* from the University's College of Education and Behavioral Sciences. In 1983 he was presented Western Kentucky University's *Distinguished Public Service Award*. He was the featured personality in 1989 in *Organization Development Journal*, and in 1992 was highlighted with Lech Walesa, Polish Solidarity Leader, Nobel Prize Winner, and past President of Poland, on the cover of the journal *Education*.

In 1999 and again in 2000 he was Western Kentucky University's nominee for the Carnegie Foundation's Professor of the Year national award. He holds Diplomate status in counseling from a number of professional organizations.

Casimir J. Kowalski

Dr. Casimir "Cash" Kowalski was born in Poland and spent his formative years in Germany. He immigrated with his family to the United States. After attending grade and high school in Syracuse, New York, he went on the obtain a Bachelor of Science in Education in 1965 from SUNY Oswego, which honored him in 1984with its *Distinguished Alumnus Award*. In 1972 he earned a Master's Degree in Guidance and Counseling and in 1973 and Ed. S. degree in Student Personnel Services from Western Kentucky University, Bowling Green, Kentucky. In 1975 he received and Ed. D. degree in Higher Education Leadership from Indiana University, Bloomington, Indiana.

Dr. Kowalski has consulted with a number of organizations on such topics as adult education, leadership development, teaching effectiveness, student retention and fund raising. He has generated millions of dollars for the institutions with which he has been affiliated through creative fund-raising projects and grants. In 1987 he was invited by the Organization Development Institute to present a paper on participative leadership at the Seventh World Congress in Moscow, USSR. The following year he was visiting professor to Lanzhou University in China, where he lectured to students, faculty and government officials on participative management and higher education issues. In 1989 he was invited to Poland by the Polish Academy of Sciences where he conferred with Solidarity Leader and past President of Poland, Lech Walesa, on problems of leadership in the Polish economy.

Dr Kowalski has developed and successfully implemented techniques to strengthen institutions through organizational development, strategic planning and fundraising. In 1991 he was awarded the Outstanding Civilian Service Medal by the U.S. Army. In 1992, 1993, and 1994

he was invited to Ghana, Africa by the U.S. Agency for International Development (USAID) to consult on strategic planning with the presidents and faculty leaders of the University of Ghana at Legon and the University of Cape Coast. In 1994, he traveled, by invitation, to the University of Suceava, Romania and the University of Istanbul, Turkey to establish linkages with Ohio State University for faculty and student exchanges. He visited Universities in France, the Netherlands, Japan and Russia in 1993 and 1994 to establish additional partnerships with the College of Business, The Ohio State University.

Proficient in several languages, Dr. Kowalski is author/co-author of six books and co-editor of two books on topics of leadership and organizational behavior, and reform of teacher education in South Carolina.

Chaos Theory - Article and Book Reviews

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Reviewed by: Snell, J.C. (1978). *The Annals of the American Academy of Political and Social Sciences*, May, Vol. 437.

Chaos Theory: Catastrophic Theory - A Book Review by Joel Snell
Gladwell, M. (2000). *The tipping point.* Boston: Little Brown and Company.

Chaos Theory: Topological Theory – A Book Review by Joel Snell
Derber, C. (2002). *The wilding of America: Greed, violence, and the American dream.* New York: Worth Publishers, 2nd Edition.

Chaos Theory: A Book Review – A Book Review by Joel Snell
Caldini, R. (1993). *The Psychology of the influence of persuasion*. New York: William Morrow, revised edition.

Chaos Theory: Topological Change
Lemonick, M.D. (2002). How everything works. *TIME*, May 20, p.67.

Wolfram's New Rules
Levy, S. (2002). Great minds, great ideas. *Newsweek*, May 21, pp. 56-59
Arndt, M. (2002), Simple science, *Businessweek,* May 27, pp. 92-94.

Chaos Theory and Spirituality: Topological Change
Setzer, S. (1999). Whitman, transcendentalism and the American dream: alliance with nature's government through language. *Modern Science and Vedic Science*, Volume 9, #1. www.mum.edu/lit_dept/whitman. pdf.

Chaos Theory: Catastrophic Theory Book Review by Joel Snell
Peterson, J. (1997). *Out of the blue.* Danielle, Arlington, Virginia: La Porte Book Publishers.

Chaos Theory: Topological Theory
Omerod, P. (1998*). Butterfly economics: A new general theory of social and economic behavior*. New York: Pantheon Books.

Margaret Wheatley's *Leadership and the new science* and Beyond…
Malik, Pravir www.aurosoorya.com/newscience.html

Strongest, S. (2003). Synch: the emerging science of spontaneous order. A review in *Newsweek*, March 17, 2003, p. 49.

Chaos Theory: Topological Theory A Book Review
Putney, G.J., & Snel, J.C.(1965). *Normal neurosis*. New York: Harper and Row.

A Book Review
Ritzer, G. (2004). *The Globalization of Nothing*. Thousand Oaks: Pine Forge Press.

A Review
Tolson, J. (2004) A word's eventual journey. *US News & World Report*, 2/2: p. 51.

A Review
Surowiecki, J. (2004). *The Wisdom of Crowds: Why the Many are Smarter than the Few and How Collective Wisdom Shapes Business, Economies, Societies, and Nations*. New York: Doubleday.
The book was originally reviewed by: Morrow, L. (2004). Triumph of the masses. *TIME*, May 24, p. 78.

Chaos Theory: A Book Review
Gladwell, M. (2005). *Blink: The power of thinking without thinking*. New York: Little Brown and Company.

Iron Law of Failure – A Book Review by Joel Snell
Omerod, P. (2006). *Why most things fail*. New York: Pantheon.

Halle, L.J. (1977). *Out of chaos*. Boston: Houghton Mifflin, VI, p. 657.

Reviewed by: Snell, J.C. (1978). *The Annals of the American Academy of Political and Social Sciences,* May, Vol. 437.

This work is a book about almost everything. It appears to be Halle's final summing-up. Mixing sober "realities" with witticism and early analogies, Halle attempts to describe and summarize the world as we think it is in the last of the twentieth century. Unbelievably, like Goethe in his time, almost all topics are covered including religion, physics, chemistry, music, art, and a hundred other topics. However, he constructs his argument logically in this monstrous mass of material. Starting with the physical realm from the very small to the very big, and, noting with humility, what might lie beyond each, he builds from micro-entities of life to the emergence of the "mind" and "civilization". Concluding with what the mind has created and its implications, he asks, "Where are we going?" The immediate future appears to him to dim, but from the ashes there may rise a new order and a vision recognizing the interdependence of all of life.

According to the author, at what seems to be the bottom of things is chaos and each ascending level builds upon it, in its own erratic way. Randomness, indeterminacy, uncertainty and its numerous extensions keep building and building to a contradiction. Order. As most organicists would note of any discipline, there is a transcendent, usually unseen phenomena, that the whole is larger than the sum of the parts. At this point, Halle suggests that, given the proper distance, not only society, but also an individual's life has meaning.

The author is particularly impressed with the mind of the genius that is creating a new sonnet or theory when the streets are filled with war, vice, and anarchy. Again, mind rises above

chaos. Critics may argue that Halle has started with teleological or evolutionary, deistic assumptions and made the facts to fit the theory. On the other hand, the author is quick to note his assumption, state his case, and present a masterwork in non-dogmatic terms.

As he notes toward the end of the work, a mystic (of most any persuasion) feels there is a flow, a "whole", a "way", and an essence. Though man has "mind", and therefore tension, at another level of consciousness and vision, one can see beyond the chaos to a grander scheme. It is like being on a mountaintop and feeling only casual replies from some chaos now only dimly viewed in the valley below. This is a book for many and all seasons.

Chaos Theory: Catastrophic Theory

A Book Review

Gladwell, M. (2000). *The Tipping Point.* Boston: Little Brown and Company.

Introduction

This is an excellent book featuring Catastrophic Theory, where a small change in confluence with other stimuli summates to a major significant change. It was one of a number of perspectives that comprise Chaos Theory. However, this new addition to the social science literature explains in social terms how a *tipping point* surfaces.

The foundation of Catastrophic Theory is that a tipping point, critical mass, or new threshold is reached almost overnight by a series of events that may not be newsworthy, but silently build to a crescendo where change occurs. As an example, crime plummeted when Wilson's "broken window theory" became popular and citizens of "The Big Apple" became annoyed or terrified with crime on an everyday basis. Mayor Guilliani used the broken window theory (those small flaws in the environment) by cracking down on graffiti. After that, a series of steps to make arrest easier helped crime to plummet.

In *Chaos Theory*, Snell, Cangemi, and others (see earlier) described the phenomena with physical science premises followed by social science examples. This book goes one step further by describing the social triggers that bring about social change. The three rules of tipping point are the law of the few, the stickiness factor, and the power of context.

The Law of the Few

There are just a few individuals who create change and they can connect with others with about five or six degrees of separation. These individuals have the sociological and psychological acumen to effect change. They are:

"Connectors" are folks who know most people who can create change. Their Rolodex is filled with the change leaders and all the people they know who can fill the ranks for social change. From a few, one can draw upon the thousands. Connectors can help cause a social virus of epidemic proportions that facilitate the necessary change. If you want things done you go to these special opinion leaders.

"Mavens" are the edge people that start new trends. They know the "buzz" and can facilitate change, but they cannot create or sell change to others. Mavens are obsessed with the "new" in the social environment.

"Persuaders" are the ones who sell social change. The most charismatic get in the media, and change begins with a diffusion process to the rest of the population.

Thus, if you want social change, the *connectors* get you to the *mavens* who distribute ideas to the *persuaders* who in turn market it to the rest of the population.

All of this would support Pareto's optimum ratio that 20% account for about 80% of everything. Or Michel's "iron law of oligarchy" that, in the end, a few direct and persuade the many.

The Stickiness Factor

How is it that some ideas have more adhesion to form cohesion among the leaders? Part of the social glue of an idea begins with the discussion above relative to the few who persuade the many. The author draws from the direct marketers who know in a very short time what works to sell a product or service.

First is the messenger (the salesperson listed and discussed above). Second is the ad that creates a feeling that isolated individuals are part of the message. Third, there must be an easy entry to get from the message to the product or service (which in this instance are ideas). Last, is the repetition necessary so that the many can hear from the few? Thus, change occurs.

The Power of Context

An earth-shaking event ignites the change. All of the above discussed is boiling under and is ready to surface, then a President is killed, or two airplanes deliberately ram and destroy prominent buildings in New York City, or a whole fleet of ships is destroyed in a surprise attack in the harbor called Pearl.

In reverse fashion, a hapless subway rider shoots four young men who are trying to mug him on the New York City subway. Say the name Bernie Goetz and even twenty years later eyes will light up. He is the guy who temporarily went to jail while his assailants appeared to go free…at least those that survived.

Although personalities and demographics are salient, context starts the epidemic of change. The power of the environment is demonstrated in the Zimbardo study where nice students quickly turn into brutal people, given the right environment. However, this is not deterministic. There is a continuum of internal and external triggers of personality and environment in terms of whom becomes the most brutal.

From this discussion, the environmental and personal triggers give rise to the quality of the power of numbers.

Sociologists describe the primary group as a very small group that is no more than 15 and usually the number is smaller. They are the ones that share secrets and bonds in life. Secrets are traded and intimacies abound. Peer pressure is immense.

Psychologically, individuals can only handle about six or seven categories in short-term memory. Sociologically, between 10 and 15 members is all the room there is in one's primary group. On the macro-level, 150 is tops. Beyond that, few have that much in common. As noted earlier, 20% account for about 80% of almost anything.

After that there is overload. To repeat: seven categories, 20%/80%, 15 people in primary group and 150 in work groups. From all this comes social change. These numbers are the environmental triggers on our character and our ability to effect change.

How do numbers impact our choices and our character to create change? It is through a diffusion of ideas that go through a series of epidemic curves, starting slowly, tipping, rising sharply, and becoming mainstream (institutionalization).

Rumors and influence are the seeds of tipping. This applies to shoes, suicide, smoking, and a whole host of other human activities. Thus, chaos as witnessed by Catastrophic Theory is presented in this excellent book about tipping and social change.

Chaos Theory: Topological Theory
A Book Review

Derber, C. (2002). *The Wilding of America: Greed, violence, and the American Dream.* New York: Worth Publishers.

"Wilding" originally meant that gangs of (usually) males would collectively attack (at random) an individual for money, sex or humiliation. In this book, it is a metaphor for anti-social degenerate individualism.

The IK culture is known among anthropologists as the most evil, mean-spirited culture of the remaining tribal societies today. What they do to others as well as what harm they bring within the group is beyond description. The author contends that this is where the USA is headed today.

The book is an application of Topological Theory today as indicated by Snell, Cangemi et al. In physical science terms, Topological Theory is like a Mobius band that is twisted once and connected to form a double eight circle. An ant is placed on the band and it scurries forward going from the outside of the band to the inside without ever making a jump. The band is slow and continuous like social thought that slowly evolves from one value perhaps to its opposite. Thus, once materialistic, but generous, Americans have gradually withdrawn from public life in pursuit of their own loneliness rather than fight the evils of the night on the street.

Thus, in this historical cycle, many Americans are moving from an optimistic and empathetic society to something like the IK.

What are the components that slowly and in topological ways move us into a meaner society? The author lists many causes; however, he describes *two* Americas of *wilders* and *non-wilders* as a simple metaphor to describe the ascent of wilders.

Although this was written before the attack of the Pentagon and the World Trade Center attacks, the short social solidarity that followed these events appears to have diminished. Again, wilding (the unencumbered, unlimited selfishness) appears to have blossomed. The January 28, 2002 *TIME* magazine cover suggests: "You're on your own, baby- so many choices and no one to trust in today's world."

Derber suggests that Durkheim's description of social isolation and anomie is still pertinent today. This work has a communitarian premise and looks to a society that is social democratic capitalism. Thus, there is a balance between unregulated individualism and unregulated community order.

In topological fashion wilding is a gradual product "of a declining society that is losing its authority to instill respect for social values and obligations". It is also the basis of Robert Merton's *Strain Theory* (all somehow want success, or should want success, but vary in their adaptations where pecuniary or monetary achievement is paramount).

Derber then describes wilding at various levels. His first is popular culture and everyday life. Wilding in this dimension — everyone cheats. Additionally the media encourages it! In the mean time, consumers are continually tempted with things they do not necessarily need and the economy has bifurcated. The top 20% made the most economic gains since the 1970s and the bottom 80% have stagnated. Thus, there has been a credit card mania slipping the bottom group into further debt. Further, lying is necessary to get ahead or to avoid getting "ripped off". It is a survivalist mentality.

Students binge drink, cheat on exams, abuse credit, and watch violent and sexually explicit genre. The folks at the bottom want to violate the law to get their share.

At the economic level, corporations cheat and abuse workers and consumers. They leave employee pensioners penniless. Capital can move almost anywhere and labor cannot. Thus, momentum drives down wages and pushes up profits.

Corporate welfare fosters global sweatshops and environmental degradation. Temping becomes the norm and immigrants keep internal domestic wages low. Workers become cynical and become part of the nickel and dime masses. Robber barons return to Wall Street.

Countervailing forces such as stock analysts and accountants are bought off by huge corporate entities as they become deregulated. Overcapacity is created and volatility is encouraged.

At the social level, crime is cut in half since the mid-1970s, but is higher than any other industrialized democracy. It has drifted to the suburbs, national parks, and in domestic settings.

The family is being shredded. Thirty percent of households are individuals, not families. This is an historic high. It is too easy to get pregnant, to get married, and to get divorced. Marriages, on average, may last 4 years for the first coupling.

Our infrastructure of roads, bridges, schools, and related is in need of repair and replacement. Various statistics are noted.

We have become a nation of prisons.

The author suggests a commutarian ethic to infuse in one or both parties (now propped up by corporate interests). It is based on social democratic capitalism rather than laissez-faire markets.

The author's tone in writing is one in which the spiral could go up, but is likely to go downward. In topological fashion, the events described above may gradually turn trusting empathetic social members into degenerate individuals, who look out only for themselves.
The non-wilders (those kindly souls) withdraw and cocoon. When they venture out, they may be like Putnam's folks who "bowl alone" in the afternoons.

Chaos Theory: A Book Review
Caldini, R. (1993). *The Psychology of Influence of Persuasion*. New York: William Morrow, revised edition.

The world is a chaotic place and humans appear to have a rage for order. At times, humans can think critically and at other times faithfully. When one is a target of mass marketing, the stimuli (media) encourage the person to think with one's glands or non-critically. In other words, this is a form of thinking unknowingly or unconsciously, neither critically nor faithfully. In other words, this is a form of thinking where external and internal triggers create a "click-whir" process of survival behavior. As ethnologists note, this surviving mechanism helps individuals and groups to seek life even if it means following the herd over a cliff. Marketers have learned to short circuit this perception-action and Caldini is there for us to understand the process and fight back. In other words, he becomes the Holden Caulfield of *Catcher in the Rye*. He describes various weapons of influence and how to resist them in this chaotic world.

Like an automatic pilot partly out of kilter, the following are the short circuit chaos reducing, fuzzy logic used by us. They are:

"Reciprocation" — You get a gift in the mail and feel obligated to reciprocate with money. In the industry, the gift is called "slum". It is cheap and inexpensive, but invites guilt from the receiver. The author encourages the reader to accept the gift graciously.

"Commitment and consistency"— In this instance, the marketer gets one to say *yes* to a few non-controversial questions. Then, when the product or service is suggested, one has to go against himself (cognitive dissonance) if one wants to act rationally and orderly in a chaotic world, one feels obligated to say "yes". One has made a commitment. To say "no" one must intervene early in the conversation and tell the marketer what he/she is doing. If one can do that, one has made order out of chaos.

"Social proof" — Chaos abounds, one looks to others for order. What are others doing? One thinks others know what we don't know and in collective confusion, we go along. Laugh tracks, shills in an audience, and comments like the "fastest growing" or bandwagon effect helps us all perhaps to go on a highway to nowhere. The author suggests resisting it by developing one's own internal clock or voice.

"Liking" — It is very hard to say no to someone you like. So? Buy as little as possible. All of us are vulnerable to the physically attractive, individuals who we perceive as being like ourselves, who flatter us, and those who appear cooperative. Liking appears to be an orderly process in a disorderly world.

"Authorities" — Good people are told to do bad things in a chaotic environment. They usually follow authority figures' requests. Authority is given to few individuals by clothing and titles.

"Scarcity" — In a chaotic world, we may go without. So buy now if you don't want to be left behind or left alone. Scarcity also has a deadline. We can lose some freedoms if we don't act now. Perhaps there is only one left and there may be another potential buyer. All of this causes a "brain clouding arousal". To say *no*, the author encourages calm and indicates that overwhelmingly there is usually more.

To reduce chaos, the author calls for arming oneself from the exploiters. Chaos remains, but you can still make choices if you know the strategies of confusion and the superficial order promised from the chaotic world.

Chaos Theory: Topological Change

Lemonick, M.D. (2002). How everything works. *TIME*, May 20, p.67.

Automaton is the name of an alternative way of looking at nature and its uncertainty by using pixels of computer building and design. Stephen Wolfram has produced a 1200 page overview that suggests science has been moving on the wrong track for 300 years. In his *New Kind of Science*, he begins with computer pixels that are black or white and finds that if the computer is left alone to wander it will create most of the shapes within the universe.

The basic premise is that any one pixel is surrounded by different colored pixels, and the rest is up to randomness. From this simplicity, the computer keeps building and building until there are contradictions that form order.

What Wolfram is doing is trying to symbolically represent nature. The closer the symbols become to nature the more seriously science will adhere to it.

The verdict is out because Wolfram presents so many hypotheses to test. Thus, it may be a year or years before a judgment can be made.

Wolfram is a talent. At the age of 20 he had earned a Ph.D. in theoretical physics from Caltech. From there he developed computer software that became *mathematical* and he became a millionaire many times over.

It may take years to test everything stated in his new book, but if some or many of his ideas become sustainable, it would suggest another facet of math that indirectly supports Chaos Theory.

Wolfram's New Rules

Levy, S. (2002). Great minds, great ideas. *Newsweek*, May 21, pp. 56-59.

Computer Experiments called cellular automata can generate complicated and unpredictable patterns beginning with simple rules.

Simple Rules also underlie the vast complexity of the natural world - everything from living organisms to traffic jams to the shape of the universe.

Nature can thus be said to run its course in the same way that a computer runs a program.

Applying that idea can help solve tough problems that have baffled scientists for centuries.

A Review of Wolfram's New rules

Arndt, M. (2002), Simple science. *Businessweek*, May 27, pp. 92-94.

"No doubt his most controversial notion is the radical claim that most of what happens in nature, from the way leaves flutter in the breeze to the thought patterns of our brains, may spring from the same computational processes."

"The weather represents computations as sophisticated as anything in our brains."

Chaos Theory and Spirituality: Topological Change

Setzer, S. (1999). Whitman, transcendentalism and the American dream: alliance with nature's government through language. *Modern Science and Vedic Science*, Volume 9, #1. (**www.mum.edu/lit_dept/** whitman.pdf).

Dr. Setzer* is a contemporary Vedic scholar and in this evaluation of Transcendentalism she provides a current analysis of a movement that traces back to the mid-19th century.

Parenthetically, Chaos Theory suggests that there is an unseen order beneath numerous contradictory events. As a theory it is non-theistic. At best, the word often used is "flow". It is a neutral term and other than theistic in origin. However, we are entering an arena that may be of interest to scholars in both religion and literature, as well as the social sciences.

Western religions are anthropomorphic and mysticism is usually called "concrete mysticism". God is a creature that is beyond understanding. Christian mystics describe difference of matter and theism by "accidents" and "substance". Jews describe the holy other in the *Kabula*, and the Nation of Islam usually describes mysticism through the Sufi's.

Eastern religions see God as an Over soul. The unseen is "Wu" (Taoism), "suchness" (Buddhism), or for the Hindu it is Namarupa or "presence".

As Setzer notes in a lengthy analysis of transcendentalism of the mid-19th century and current Vedic (Hindu) thought is that matter and spirit may be connected. Language is part of matter and can be directly connected to spirit through poetry and perhaps other aesthetic forms. Language can even unify the chaos in society, although deconstructionists would argue against this.

Setzer provides an exhaustive account of culture, religion, society, history and the self in trying to rescue the criticisms of the trans-cendentalists by postmodern literary critics. The authors do not have the time or space to make a complete review of her excellent article, but would ask the readers to make their own assessment. She does describe various levels of consciousness and the connection to language and the language of culture.

Sociology and social psychology's symbolic interaction may Setzer's analysis. The self was borrowed from transcendentalism. The self is composed of the "I" and the "Me". The "I" is the special spark from God (the atman) or spontaneous self. The "Me" is the social portion of the self that is predictable so that the fabric of society can remain intact. There are portions of us that require us to be group creatures so that the machinery of society can continue. How we vary from each other as individuals is the search in the universe of a grain of sand or in the very innermost portion of the "I".

Symbolic interactionists maintain that language creates the mind and the self. Today, that is considered too deterministic, because the self has now been explored in the material sense of brain physiology and the non-material in terms of mysticism and related.

Setzer's entire article in some ways reconnects the self with matter and spirit in spite of the deconstructionists' assumptions that we are creatures with minimal root metaphors and that we must assume that there is a reality, however socially constructed and spurious.

For the purposes of this book, we wander too far. We want to acknowledge the unseen and suggest that it may play a part in the chaotic underpinnings that create macro order. It surely is Chaos Theory.

**Susan Setzer is now Susan Krogh-Ryder*

Chaos Theory: Catastrophic Theory Book Review

Peterson, J. (1997). *Out of the blue.* Danielle, Arlington, Virginia: La Porte Book Publishers.

This book by award winning John L. Peterson is a first class experience in reading about Catastrophic Theory. What Peterson does is examine close to 190 *wild cards* that pop up in the future (unannounced and unwanted). There is even a page for what happened 9/11/01.

Each page has some probable kinds of events like a large blackout, to a computer virus, to possible occurrences where folks learn how to do out-of-body experiences or UFOs become a recognized reality.

Then the author takes each "out of the blue" event and discusses possible social and technical implications and where original sources may be obtained. After that, each event is placed in a number of categories (impact factors) and given a tentative number on the impact on society in encouraging …chaos, although that term is not necessarily used.

The categories are: rate of change, reach, vulnerability, outcome, timing, opposition, power factor, impact index, foresight factor and quality.

The book is an insightful and readable source and can easily be used to discuss numerous impacts in the future. The possible implications include such things as tools, energy, group relations, wellness, and others.

Although this was published in 1997, the reader should look at some of the wild cards discussed and the categories. This includes: terrorism goes biological, human mutation, medical breakthrough, bacteria becomes immune to antibiotics, terrorist attack in the United States, environmental war criminals are prosecuted, the growth of new age philosophies, stock market crash, second nations get nuclear weapons, and related are discussed. It is an excellent book for the Chaos Theory library and is an excellent resource in Catastrophic Theory and its related components.

Chaos Theory: Topological Theory

Omerod, P. (1998). Butterfly economics: A new general theory of social and economic behavior. New York: Pantheon Books.

Butterfly economics means that little things mean a lot economically. No matter how you measure it, human behavior has a random quality to it, and yet, order generally prevails. Omerod applies "Chaos Theory" to voting patterns, marriage, divorce, and even to crime. Conventional economic models remain flawed. Why one technology out competes another is sometimes random and not easily understood. Economics should move slightly away from the hard sciences and move more toward social factors.

Margaret Wheatley's *Leadership and the New Science* and Beyond…

Pravir, Malik www.aurosoorya.com/newscience.html

This is a fairly complete analysis of Margaret Wheatley's *Leadership and the new science.* According to Pravir's analysis of Wheatley, we live in a world that, at times, goes beyond cause and effect. Thus, when social activity occurs, there is a chaotic, yet somewhat orderly, co-evolution of events. One world co-evolves as we interact with it.

Mechanistic paradigms cloud our vision about the wider reality. "It has been found that free systems have been held within boundaries that are well-ordered and predictable. A chaotic system over time becomes orderly".

We live in a "flow;" we may find a way to deal with it, and yet methods become rigid. Thus, if the flow is constantly changing, so too should the strategies; and usually there is a lag. Ultimately, it appears that reality has a personality and intelligence. This causes a "fuzziness" that irritates empiricists.

For organizations, strategic planning should be replaced with "just in time" action. In other words, "strategic thinking" should replace "strategic planning". It is more important to react effortlessly. In an organization it is less important *whom* one *is* than *whom* one *meets*. Rather than having an organizational chart of line and staff, it would be better to have interaction channels.

The most important aspect of an organization is looking for the subtle processes and to try to put words to them so that the process stays ever adaptive. In other words, *what did we do to solve a problem*? *Can we do it again, but in many different ways*?

Strongest, S. (2003). Synch: the emerging science of spontaneous order.
A review in *Newsweek*, March 17, 2003, p. 49.

There appears to be a spontaneous order beneath and far above the disorder that appears to us everyday. The author gives examples of how numerous people, plants and animals generally act "in sync".

The author discusses how women become menstrual together when certain other females come into contact with them. Perspiration appears to be the key. Thus, their bodies adjust to those other females around them.

Other synchronicity appears to be found in traffic patterns, fireflies flashing together and how fish schools can cause the flight away from predators. Other examples appear in neurons, and even fads. Fads deal with social networks and "tipping strategies".

Chaos Theory: Topological Theory
A Book Review
Putney, G.J., & Snell, J.C.(1965). *Normal neurosis*. New York: Harper and Row.

We revisit this social science best seller of many years ago. The original ideas came not only from the authors, but also G.A. "Bob" Young, M.D. One of the authors (jcs), along with an illustrious group would listen and interact with his psychiatric heresies. His position was that growth came from inside and connected with environmental triggers through the mechanism of projection. The group included a talk show host from Kansas City, an Anglican priest, a high school principal, and a cattleman from a western state.

We listened and talked about the issues discussed in this book. Incidentally, the time of these meetings was about the same era as *Girl Interrupted*. The difference is that most would grow and the emphasis was that medication for depression was important, but the other major consideration was how to grow and how to live in everyday society.

What is attractive to the authors about this book is that *Normal Neurosis* describes at the end, the "downward spiral". Most would probably agree with this position but for different reasons and interpretations.

The basic premise is that we chase after the very things that we probably don't want and project onto others that we should want them. Further, we act in ways that are probably not nurturing to others or ourselves. Americans are driven.

The Putneys describe this in ways that are topological, indirect, and evolutionary in content. We drift downward out of search for indirect self-acceptance.

The goal was autonomy. However, we know now that this issue is not enough. We are still citizens of the world and not "unencumbered selves". Thus, we are interconnected and there are certain "habits of the heart" that we should conduct even in the large post modern, global information society.

Without some commutarian ethic, we become a dust heap of social isolates, adrift in a wider world.

A Book Review

Ritzer, G. (2004). *The globalization of nothing*. Thousand Oaks : Pine Forge Press.

Mystic Pizza is a small Ma & Pa pizzeria in Mystic, Connecticut. There is only one in the country. Mystic has a wonderful pizza with secret ingredients. There are three waitresses of whom all the locals know and have an ongoing relationship. In fact, one of the three looks a lot like the movie star Julia Roberts.

The establishment has been in its original site since forever. It has been passed down by generations. The restaurants exterior and interior have changed little over the years, but it is attractive and well maintained. The family restaurant attracts folks from many parts of New England because of the good food and the tradition and lore attached to the food retailer. It takes a while to get the pizza, but it tastes so good and the tipping is quite good for a place of this stature. The Mystic chamber of commerce includes Mystic pizza in its promotions. Pizza Hut is also in Mystic. There are hundreds of such restaurants owned by somebody or a group of some bodies that live faraway. The corporation somewhere standardizes the pizza and they may make some regional changes to suit customers in a particular local. All the "help" wear the same uniform and the turn over is considerable. If you have seen one Pizza Hut, you have seen them all.

That is an overstatement but there is a lot of truth to that remark. It is serves pizzas in a hurry and they taste damn good. The menu is developed in one part of the country; the ingredients are transported from another part of the county from the Pizza Hut factory to the local retailer. Business procedures are standardized. If the site is not profitable, the building is leveled and sold to another retailer. The Chamber of Commerce has a picture of Main Street; Pizza Hut is one of the retailers in the picture. According to Ritzer, Mystic Pizza is something and Pizza Hut is nothing. Nothing is a phenomena that you can touch, see, and feel, but little else.

Welcome to the Nullities. They include that:

1. Central headquarters creates the pizza retailer somewhere else and controls it. The local building is quickly constructed or removed according to profitability (and they look pretty much the same.)

2. The pizza is interchangeable with other Pizza Hut pastries all over the country and beyond.

3. The "help" are wonderful, efficient and forgettable because of restricted conversations and turn over.

4. It is not a service (or product) that one remembers and reflects upon. It just works.

Ritzer does not say that nothing is necessarily bad, rather is a product of his first book, *McDonaldization*. In that he describes the globalization of American services and products that extend all over the world. Although he makes a plug for the anti-McDonald's like the "slow food movement", he recognizes that nothing will continue to gain popularity because it generally works. If you are driving along an interstate and there is a sign advertising a *Ma & Pa* versus a *nothing*, you will probably choose the nothing because you have eaten at them before and food and service is probably safe and affordable. Ritzer's excellent book is a wonderful follow-up to *McDonaldization*. He places in an appendix a heavy-duty discussion of nothing and illustrates his theory in a grand narrative using post-postmodern theory. We will remember Mystic Pizza and it may continue to survive. However, Pizza Hut has deep pockets and can compare profitability with like locations all over the country and world. Thus on going life of Pizza Hut is likely unless it is taken over by somebody else from somewhere who for some reason wants to sell each building. Ritzer should finish with a trilogy. The first two (globalization and nothing) may give rise to *Bowling Alone at Walmart: Nobodies From Nowhere*. This means that globalization and nothing finally give rise to the social fragmentation or blurring of a Nobody in nowhere. It signifies that the individual has so many changes and so many disruptions by nobodies, from non-places, non-things, non-people, and non-services that life becomes overwhelming and individuals retreat from community. This is an excellent example of Chaos Topological Theory.

A Review

Tolson, J. (2004) A word's eventual journey. *US News & World Report*, 2/2: p. 51.

As Tolson's review of Robert Merton's latest and last book *The Travels and Adventures of Serendipity*, we discovered how word usage vary by time and eras of scholarly and popular usage. This is the last Merton book before he passed on last year.

Serendipity is one case of a term that has history and cultural variation throughout the ages. It means a chance discovery and originates with Horace Walpole who used the term in 1754. For many years, the word fell into disuse because of the intellectual temperament of utilitarianism and evangelicalism. Walpole was thought to be a dabbler of trivia.

By the 20's, sciences and social sciences were repeatedly discovering by chance new and insightful research, which was then replicated and validated by scientific protocol. Merton also played a hand in reintroducing this term in American sociology.

With the advent of Chaos Theory, Snell et al. (1999) believe serendipity should remain in the mainstream for a long time. Serendipity is one of the most profound pillars of Chaos Theory and the ongoing discoveries such as the recent insight of the use of fMRI reducing bi-polar depression. Those anti-depressants were inadvertently discovered in treating tuberculosis patients. Serendipity may become synonymous with the first bifurcation discovered in a new study.

At any rate, Merton may have for our country the first and last word on this subject that he "discovered" in his own lifetime.

A Review

Surowiecki, J. (2004). *The wisdom of crowds: Why the many are smarter than the few and how collective wisdom shapes business, economies, societies, and nations.* New York: Doubleday.

The book was originally reviewed by:

Morrow,L. (2004). Triumph of the masses. *TIME*, May 24, p. 78.

Most information at this point in history is that the few guide the many. In "Pareto's ratios" 20% account for 80% of most everything. According to "Michel's Iron Law of Oligarchy" the

few run the public. The most rewarded of a movement are those that win and run the new regime or government. In other words, the few benefit from the action of the many. For LeBon, crowds demonstrate our collective ignorance. Crowds can bring the worst out in us. When Marx describe the masses, they are enlightened when they realize how little power they have not owning the means of production (false consciousness.) Pareto also warned that the masses become lionized only when the talented are shunted and remain at the bottom. If they are able to move up, they can be pacified and no longer will represent the masses (the circulation of the elite). All suggest that *the few* run *the many*. If they do not succeed, they will be replaced by another group of elite, claiming to represent the people.

Surowiecki, an economics and financial writer for *The New Yorker* essentially throws out the above paradigm and suggests that the masses are generally but imperfectly correct. Sociologist may quibble in a salient fashion about the interchange of the terms of collectivities, crowds, masses, mobs, movements and related. All have different meanings. However, the author appears to use these as synonyms for the "many".

He suggests the following to support his thesis.

1. Galton asked a crowd to estimate the weight of a dressed carcass of beef. The valid answer was 1,198 pounds. The crowd privately wrote their answer on stubs of paper and guessed 1,197.

2. He borrows Hayek's "spontaneous order of the masses".

3. He suggests the power of starlings and their collective wisdom of survival by flying in certain formations.

4. He cites the intelligence of a big city pedestrian flow or humans reacting in a traffic jam.

5. He reviews a 1958 experiment where New York City students were asked to meet another student and where they would be when the stranger arrived in town and did not know directly how to find their big city friend. All said that they would go to the information booth of the Grand Central station.

6. Scientists all over the world within a short period and without overall supervision were able to contain the SARS virus in a matter of weeks.

This thesis is quite controversial and if it is survives the usual Hegelian dialect of reviewers and critics will moderate the place of intellectual legends of both the right and the left. If this new paradigm succeeds the few guiding the many may be retranslated into the few may guide the many in only certain circumstances.

The book appears to be a valuable contribution to the literature on institutional change.

Chaos Theory: A Book Review

Gladwell, M. (2005). *Blink: The power of thinking without thinking*. New York: Little Brown and Company, first edition.

This best seller is the 2nd major book by Gladwell, his first was *Tipping Point* described earlier in this book. Some of the material is found in Caldini's *The Psychology of the Influence of Persuasion.* Further, this author draws on the latest findings and skips over the worthy contributions by Freud and Pareto.

Blink comes from the blink of an eye. How is it that we make snap judgments to survive? That many of these decisions are correct even when we get more information? We live with a vast reservoir of the unconscious that comes into play all of the time and favors our perception and consequent action.

One can get an adequate view from many sources, but *www.socialvibes.net* provides a good review. The New Republic's overview is perhaps the most exhaustive. Gladwell also spends a chapter discussing when snap decisions are *wrong*. However, much of his time is spent showing the reader how much research errs because there is too much information, or the information is not salient because it was done in the wrong setting or has the wrong research protocols.

For the purpose of this book, he spends nearly 45 pages (chapter 4) reviewing the theme of his book…Chaos Theory. He introduces us to Chaos Theory by way of a Pentagon war game simulation. We maintain that chaos complements the equilibrium model. He compares the two on equal footing. For him, chaos is a manifestation of the psychological blinking. The two complement each other and are both post modern in the sense that they are not neatly ordered and non-linear. Serendipity and surprise as well as the natural mess that we call life have an order not necessarily seen. As John Povilaitis noted in the forward, military battle plans stop at the point of battle.

The Pentagon had arranged a new high tech, math oriented equilibrium model or systems theory to be constructed to represent the blue team. Systems theory is also called functionalism, structure-functionalism or cell-sociology. Historically, it has also been called organicism and another revision, positive organicism. In this theory, component parts have various arithmetic values and each part triggers another part so that the whole is larger than the sum of the parts. Simply 1+1=3, where 3 represents the large and elusive whole that keeps the system so that it is continuous. The parts know what the other parts are doing, morale is encouraged, as is communication, and boundaries are maintained. Most of us see that 1+1=2; however, the 3 is created by the parts doing their jobs.

The opposing red team was basically arranged by around Chaos Theory assumptions. Certain goals (such as destroying the enemy) occurs because the warriors and their leadership are constantly reminded of the micro-triggers that continually change the plan. That, up to a point, less is more, and that even more information fogs the war. It is non-linear in that when you start at A (because circumstances require it), you go to T and then back to B followed by S and Q.

Blinking means that one is directly geared to the realities of the war and less to numerated information that may or may not be helpful if everything had gone as planned. Chaos notes that in most of the chaotic world, things do not go as planned; if you assume an order, then you let reality tell you.

So, what happened? The blue team with reams of data and communication systems had an elaborate battle plan. The scenario was to occur in the Middle East. The blue team attacked, and high-fives and jubilation emerged as the blue team started eating up new territory. The red team appeared to shamefacedly retreat.

In their retreat they moved to the vulnerable side of the blue team. The red team was using primitive strategies like bicycle riders acting as couriers, and using specific lighting signals to tell planes where to fly and fight. The blue team was oblivious to these non high-tech methods. Further, the red team sent phony messages intended to be intercepted by the blue team. As the blue team turned one way, and felt assured by the frequent conversations intercepted and data analysis, the red team went around the other way and destroyed most of the blue team's ships and fighter planes.

The war was over before it truly began. The red team acted as insurgents and quickly learned that a straightforward meshing with the blue team meant a loss. They then innovated with small but necessary information and ultimately won.

In other words, blinking, Chaos Theory, and other non-linear strategies were pragmatic enough to outwit the data weighing and the analysis of the blue team. Furthermore, the computers

gave the blue team the false confidence to believe they could win the war with knowledge and reason. To use another metaphor, the Titanic was sinkable.

The Pentagon was dumbfounded. Millions, if not billions, were infested in their new system. So, what did they do? They started the war game all over, but it was scripted. The blue team beat the red team in a walk, and the Pentagon declared victory.

Later, as the author notes, American troops attacked Iraq using the same system that had failed before in simulation. Baghdad easily fell, but soon American troops found themselves in a deadly guerilla war. In such wars, insurgents (the red team) have numerous advantages with much less resources.

As this is being written, we do not yet know what will happen in Iraq, but we do support the troops and we also support systems theory and data analysis. With this account, we are suggesting that *all* of the strategies be used in research. We favor triangulation when it comes to research protocols. That means that both the qualitative and quantitative measures be used and reported in research.

Additionally, systems theory, or a variation of it, lost to a variation of quick decisions and chaos theory. That does not mean that in the future quantitative measures cannot be run so quickly that Systems Theory conquers Chaos Theory. It could also be stated that we had two systems theories fighting each other in which the faster more pragmatic one won.

Blinking complements both Chaos Theory and Systems Theory. In this setting, Blinking Theory and Chaos Theory will hopefully complement Systems Theory. However, that discussion must be left to the future.

Iron Law of Failure – A Book Review by Joel Snell

Omerod, P. (2006). *Why most things fail*. New York: Pantheon.

Omerod, who is the author of *Butterfly Economics* illustrates how catastrophic Chaos Theory works in the natural world and in the life and death of most businesses. For short interims, reality appears to stabilize and change appears to be gradual. Then a whole spectrum of species and businesses die. From the ashes of the catastrophe, new businesses and species emerge. The cause of the death of the last business is a tremendous change in the economic system. For species, it is a massive change in the environment that affects the topography and kills plants and animals.

In Economics, one has the illusion with bell curves, ratio numbers, statistical analysis of "stasis." However, equilibrium soon breaks and struggle slaughters most of anything. That which arises is an adaptation to the present, not the next catastrophe.

Companies are blind sided like dodo birds. Only a *few* survive. The large slaughter is somewhat like the *Iron Law of Oligarchy* by Robert Michels. His premise is that in most, if not all things, a few start and then many, and yet only a few survive. If they have enough power they then cook or jimmy the system to create imperfect competition. The few win over the many. However, Omerod's contribution is that he underlines through Chaos Theory how the many fail. Or, how the many do not grow to be giants.

We do not live in an even flowing linear world. We may impose order with words and numbers, but the order is really not seen even though it is there. Chaos appears to triumph, only to give birth to more survival of new businesses. In the end, it is winner takes most. It is somewhat similar to *Pareto's Optimum Ratios*. About 20% get 80% of everything. It takes liberals, social democrats, and neo-socialists to redistribute some of the wealth to the 80%.

Omerod is proud of Coca-Cola when they changed the "classic coke" to "new coke." When that flopped, they quickly changed back to the original formula. Thus Coke survived. On the other hand, LONG TERM CAPITAL MANAGEMENT, a hedge fund, failed. Yet, the

academics running it kept going back to the same premises. It finally bailed and was backed by the government to investors.

Omerod has little faith in long term planning of any sort or redistribution. We still do.

SOCIAL ESSAYS ON

CHAOS THEORY

At times, unintended small changes in one area of society can have tremendous impacts on another part without any of us realizing it. These micro social variables are sometimes called “butterflies” and they suggest that reality is ever more unpredictable and can humble but not diminish the social sciences. Come with us on our exploration of chaos theory and the fluidity of post modern global information society.

Professor JOEL C. SNELL is Professor Emeritus of Kirkwood College and Research Fellow for the Arlington Institute, a Washington D.C. “think tank.” He is author of 10 monographos and over 450 publications. Professor Snell has been on numerous editorial boards and a Fellow in a number of honoraries. Snell is listed in all the WHO’S Who.

DR. JOSEPH P. CANGEMI is Professor of Psychoology at Western Kentucky University and an international consultant in the areas of leadership effectiveness and productive and profitable organizations.

DR. CASIMIR J. KOWALSKI is Professor of Educational Leadership and past Dean, School of Education, South Carolina State University, and former Campus Executive Officer (president), Penn State University, McKeesport.