Chapter 12

Observing Public Policy in a Global Context

Alexander Dawoody

Additional information is available at the end of the chapter

http://dx.doi.org/10.5772/45657

1. Introduction

Public policy is a complex, global phenomenon. This means that it exhibits complex and chaotic behaviors that cannot be fully uncovered and understood through the traditional linear observation which promotes concepts such as control, local causality, instrumentalism and breaking the whole into building blocks. This article addresses the inability of the linear model in observing public policy and its global flux and unpredictable nature. The article offers a strategy to apply complexity dimensions in observing of public policy in global context that emphasizes autonomy, network, relationships, flexibility, forecast, and subjectivity. The research design used in this article is qualitative because of the depth of information that words and content analysis can provide in explaining the application strategy of a complexity-based model in observing public policy. The article does not suggest that the current strategy in observing public policy to be abandoned or replaced by a complexity-based model. Rather, the non-linear and unpredictable nature of public policy can benefit much more if examined by incorporating dimensions from the complexity sciences.

The world of public policy, like any other living system, is not static and continually changing, moving through cycles of equilibrium, oscillation, chaos, collapse, emergence, equilibrium-disequilibrium-equilibrium, oscillation, and so on. The cycle of birth and rebirth is continuous in order for public policy as a dynamic system to live within changing conditions in its environment (Smith, 2007). Such transformation is irreversible, non-predictable, determined, and interconnected (Richardson and Goldstein, 2007). Delaying the systemic evolution of public policy through artificial engineering will create catastrophic results (Brown, 1995). This is why studying public policy through complex models is important in order to allow for the participant/observers to examine its natural progression and cyclical dynamics and prevent any attempt artificial engineering that will result in more harm than good (Harrison, 2006).

Systems, including public policy, do not live independently in the world (Harrison, 2006). There is no starting or ending points in the system's web of associations and interconnected networks (Newman, Barabasi and Watts, 2006). Changes within these systems are not predictable and thus it is fruitless trying to anticipate the nature and timing of these changes or planning ahead to dealing with them (Miller and Page, 2007). Rather, these systems are in continuous state of flux, unpredictable, interconnected, and involve mutual causality through negative and positive feedback that trigger multiple internal and external changes within a pattern of association and interconnected relations (Morgan, 2006). Every trigger in the environment will be corresponded with changes within the system's internal dynamics, while such changes result in impacting the environment in return within series of interactions and feedback. Triggers can vary in size and magnitude (Nowak, 2006). Most triggers are small in magnitude yet the resulting changes within the system's internal dynamics can be large (Lorenz, 1996). Hence, Lorenz's famous question "Does the flapping of the butterfly wings in Brazil cause a title wave in Texas?"

Most natural sciences are linear. Social sciences, on the other hand, are complex (Miller and Page, 2007). Yet, the complex nature of social sciences is often misunderstood. This is because we, as human beings, inherit our knowledge linearly and it is difficult transferring it to complex domain (Taleb and Blyth, 2011). Nevertheless, we live in both the linear and non-linear worlds simultaneously. Our linear domain is characterized by predictability and the low degree of interaction among its components. This allows us use mathematical methods to make forecasts (Guastello, 2002). In the complex domain, we are devoid of visible causal links between elements and rely, instead, on interdependence and extremely low predictability (Kauffman, 1993). This is where a complexity-based model can become useful in explaining causality, interdependence, and low predictability.

One of the errors we do when we are in the linear domain is we have an urge to control (Capra, Juarrero, and Uden, 2007). We do this in our daily routine interactions, or in public and economic policies (Harrison, 2006). Although all indicators point to the contrary and results demonstrate the fatality of such behavior, we, nevertheless, persist on maintaining this trait (Buchanan, 2003). In addition to control, we also exhibit another fatal tendency that we inherit from the linear domain, which is the propensity to predict (Brown, 1995). After the financial crisis of 2007-8, for example, many people though that predicting the subprime meltdown would have helped. It would not have, since it was a symptom of the crisis, not its underlying cause (Taleb and Blyth, 2011). Life is not predictable (Barabasi, 2003). No matter how much time we spend on devising models and instruments for predictability, we will never be able to trace chance (Capra, 2004). Because of this, we fear chance and randomness (Juarrero and Rubino). However, when we live in our complex domain and allow for complexity to assist our analyses and observations we can rescue ourselves from control, prediction, and fear of randomness. Therefore, we ought to welcome variation as the source of information. We also ought to observe the system itself and its fragility, not events. And, we ought to apply percolation theory by studying the properties of the terrain rather than single elements (Capra, Juarrero, and Uden, 2007).

By understanding public policy globally and through a complexity lens we can create a new way of thinking about changes in governance and citizen participatory that will enable us better understand the flux nature of our world and its shared-reality construct (Kiel and Elliott, 1997). A complexity-based model can enrich the observing of public policy by helping us better deal with changes without control, predictions, long-term planning and artificial engineering (Harrison, 2006). Perhaps the most fatal and dangerous element we had inherited from the linear domain is our tendency to prevent systemic volatility and persisting on the illusion of maintaining "stability" through artificial engineering (Goldstein, 2007). This type of error, often adapted by policymakers, is the recipe for disaster and often results in catastrophe (Brown, 1995).

2. Research questions

1. Why the need to examine public policy as a global, non-linear science?
2. What are the problems caused in observing public policy according to a linear strategy?
3. What are the benefits gained in applying complexity dimensions to the strategy of observing public policy as a global concept?

2.1. Research design

This research uses qualitative methodology and analysis with the investigator as a participant-observer. The analysis involves tracing concepts that compose evolving themes. The behavior of these themes is utilized through content analysis in order to explain the contrast between two strategies in observing public policy, one according to a linear model and another according to the application of complexity dimensions within a global context. Ethnograph is used to help in identifying emerging concepts. Group A involves observing public policy as a traditional linear model without emphasis on global context and global interconnectedness to policy issues. Group B involves observing the same subject while applying complexity dimensions to observing strategy and within a global interconnected framework. No personal information of participants is collected. For Group A the investigator assigns a syllabi, readings, textbooks, and assignments. Traditional role of an instructor is emphasized to set objectives, structure, and assess outcomes through evaluating performance, participation, presentation styles, and exams. Policy issues are discussed and analyzed within local, regional, and national levels. Selected areas in foreign policy are applied but only from the local/regional/and national perspectives. For Group B, the investigator restrains from a hierarchal and controlled methodology. Instead, he acts as a facilitator who encouraged autonomy, self-assessment, subjectivity, and growth. Assessments are measured collectively as a network through observers' interaction and coordination. No textbooks, schedules, or syllabi are assigned by the instructor. Complexity dimensions are introduced in order to observe the complex and unpredictable nature of the non-linear public policy in global context. Globalization is treated as a fluid and flux environment for policy formulation, implementation, maturation, and challenges. Local, regional, and national elements are linked to a global framework in order to understand the

multiple forces interplay in producing and impacting a policy. Observation is bottom-up through empowering participants to become active global participant-observers. A new state of awareness is encouraged through dynamic participation (Capra, 2004). Attention is shifting from a particular unit (building-block) that stresses locality in the observation process to the overall global network and relationship (Kelso, 1995). As such, the complexity-based model acts as a pedagogical agent in transforming participants from localized individuals to cognizant global participant-observers (Kiel, 1999).

3. Observing public policy in global context

There are various dimensions driven from complexity sciences that can be applied to the strategy of observing public policy in global context. These included the nature of change, relational operations, non-linearity, continuous flux, the paradigm of Taoism, shifting objects to events, Kondratev Cycle, and removing theory from abstract (Dawoody, 2011).

The Nature of Change is when a dynamic systems exhibit temporal behaviors. Change becomes uncertain, unpredictable, emergent, and transcending and the system's parameters with its environment become fused, allowing through ongoing relationships. A typical dynamic system can exhibit a variety of temporal behavior. When the behavioral history of a system is examined, the nature of change becomes the core of its inquiry (Brown, 1996). If a system becomes unstable, it will move first into a period of oscillation, swinging back and forth between two different states. After this oscillation stage the next state is chaos, and it is then the wild gyrations begin (Wheatley, 2006). Such dynamic is global in its context and cannot be understood not operated within a local limitation.

If we look at public policy as a dynamic global system and examine the nature of changes within it we can see these changes requiring oscillation, chaos and the birth of new order on global level that can be manifested within the local particularities. However, often these changes are artificially engineered in form of reforms in order to stop the systemic collapse and prolong its decaying structure beyond its natural time. When observing public policy as it reacts and interacts with its global environment, we need to realize that fluctuations can take place (Kendall, Schaffer, Tidd and Olsen, 1997). Fluctuations are initiated by changes in the environment and lead to corresponding changes within the globally interacting system through positive and negative feedback. Positive feedback translates changes in the global environment to more changes in the system's localized internal dynamics, and fewer changes in the global environment will lead to fewer changes within the localized dynamics of the system. Negative feedback, on the other hand, is when more changes in the global environment lead to fewer changes within the localized dynamics of the system while fewer changes in the global environment lead to more changes within the local dynamics of the system (Morgan, 2006).

This environmental global stochasticity increases the probability of some policies of program local extinction. Policies and programs that evolve on local levels are those who are selected against (Kendall, Schaffer, Tidd and Olsen, 1997). The evolutionary feedback, according to De

Greene, is characterized as non-equilibrium conditioning which leads a global dynamic system toward crossing a critical threshold on a localized level. Beyond this threshold the system becomes structurally and universally unstable, which leads to dissipation for further evolution (1996). The local system's interactions with its global environment is continuous, fused through its parameters that act as sensory receptors to capture changes in the environment and transmit them to the system's internal dynamics for corresponding changes both on local and global levels (Kauffman, 1995). The resulting configuration within the system's internal order is emergent, allowing for new structures, patterns and processes to emerge through self-organization in order to fit best with the changing dynamics in the global environment (Vesterby, 2008). The relationship between the local system and its global environment is as such an active relationship that benefits from feedback and translates into systemic morphology (Ruelle, 1993). Stimuli from the global environment and the local system's response are based on short or long-term transitions and corresponding changes in the system's internal dynamics can be irreducible, unpredictable, and complex.

Relational Operations on global level is when interactions between a dynamic system and its interconnected global environment are relational based on feedback. Kicks that take place in the system's global environment are stimuli, causing internal disheveling within the system's structural order and processes. The self-organization process is the system's response to globalized environmental stimuli. These relational operations are random and irreducible (Dawoody, 2011).

The relationship between a system and its global environment operates on feedback that is either positive or negative (Morgan, 2006). Feedback as stimuli is retransmitted by the global environment and cause random changes in the agent's localized internal processes (Wheatley, 2006). This behavior contains the agent's morphology from static equilibrium to a state of chaos and disorder. Disorder then leads to new structures and practices (Prigogine, 1996). The phase-shifts from equilibrium to disequilibrium to equilibrium are self-organizing and irreducible, and unpredictable (Nicolis and Prigogine, 1989). Understanding public policy through phase-shifts dynamics and relational operations instead enable us capsulate the global picture in change dynamics and have better appreciation of the multilayered dynamics that interplay during their display (Richardson and Goldstein, 2007).

Non-Locality is when the globalization reality has fuzz indeterminacy. Something that occurs in region A can have an effect in region B instantaneously regardless of how far apart these two regions happen to be (Albert, 1999). This notion is known as non-locality or non-local causation. It runs against the traditional local causation in traveling the space between building blocks (Morcol, 1999). No longer are we able to assume that our experiments and observations tell us anything concrete about reality. Whatever reality is out there, it has fuzzy indeterminacy (Evans, 1999). The world is a world of global participatory collusion among local particles in which entities separated by space and possess no mechanism for communicating with one another can exhibit correlations in their behavior (Overman and Loraine, 1996). Structures collapse and evolve because of consistently small reasons that grow larger and become more complex (Brem, 1999).

Continuous Flux is when the nonlocal way of nature is characterized by a continuous flux. A flux system is a dynamic, non-static system. It is always evolving, always changing, and always responding to stimuli from its environment. During such a system one never steps into the same waters twice since these waters are continually moving (Dawoody, 2011).

Public policy is a political process. For a political process to function linearly, incremental measures are taken instead of a comprehensive approach (Lindblom, 1959). Whenever government engages in a comprehensive systemic approach, the result often yields unintended consequences that the linearity-trained decision-makers unable to accept or understand. A Complex approach better understands the flux, interconnected, global, living-in-the moment, and anticipating change than controlling.

Tao is when the flow of opposite energies determines the nature of dynamic system and all trends eventually reverse themselves (Dawoody, 2011). Complexity is an encompassing perspective (Wheatley, 2006). It builds on Western as well as Eastern philosophies. One of those contributors is Taoism. According to this understanding, contradictory elements in the world are actually complimentary elements. The flow of opposite energies determines the nature of a global dynamic system. All trends eventually reverse themselves shaped by the dynamic interplay of yin and yang both on global and local levels, a metaphor referring to the dark and sunny sides of a hill (Capra, 1991). To build on this perspective, public policy can benefit from the understanding that all things are globally relative and all things globally interconnected and matter.

Shifting Objects to Events is when truth is seen not as an attribute inherent in a system but as the meaning we attribute to that system.

We are no longer constrained by a single ontological model. Truth can now be seen not as an attribute inherent in a system or event but as the meaning we attribute to that system's interplay in an interconnected universal/global network (Buchanan, 2003). This kind of ontological liberation is evident in the paradigm shift from linear and local observation to the globalized world of complexty sciences (Evans, 1999; Wheatley, 2006). Complexity and its interconnected universal model free us from the burden that comes from needing to control and remain local rather than to evoke process and relationship on global level within a flux and interconnected dynamic network (Overman and Loraine, 1996). This understanding forces us to examine public policy not through the isolated and localized observation of its building-blocks, but in relationship of these particles with themselves and the global environment of the system as a whole (Johnson, 2002).

Kondratev Cycle is when evolution shows movement from non-equilibrium to equilibrium to equilibrium, and so on. This process is irreversible. Because of the irreversibly of structural change, the specific structures would not be the same and cannot remain local. Features within a cycle can spill over to the next cycle within the interconnected global network. These cycles of non-equilibrium, complexity, instability, and structural change is known as the Kondratev Cycles (De Greene, 1996). This understanding makes public policy an element of evolving global complex system.

Finally, Removing Theory from Abstract is when the purpose of theory becomes making the globe stand still while our backs are turned. Complexity shifts theory to an engaging and participatory forum that will change agents from observers to global citizen participant-observers capable of cycling theory through practical observation (Dawoody, 2011). Complexity enables us to transform theory from an abstract notion to an engaging and participatory international and interconnected forum (Barabasi, 2003). This understanding will enable us learn how chaos really works, and the forces that interplay in shifting a system through continuous cycle of change on global level while manifesting within local particularities (Buchanan, 2003). Out of this chaotic behavior new structures will emerge that can be sustainable since they will better fit with the changing global environment (Strogatz, 2001). This understanding can transform observers from localized blank-slates into autonomous global agents of change within the dynamic and evolving system of public policy.

4. Findings

Data resulted in identifying 97 linear/localized concepts that were utilized by Ethnograph in the content analysis. These linear concepts formed eight linear/localized themes that included control, breaking the whole into parts, one-best-way, prediction and planning, clockwise movement, artificial engineering, instrumentalism, and one-dimensional. By observing the application of these localized/linear themes between in understanding public policy, a contrast was drawn between two strategies in observing of such public: a strict linear and localized strategy that made full use of the linear themes, and a globalized perspective that utilized complexity-dimensions.

In relation to Control, for example, observing public policy as a complex system required empowering members of Group B to be autonomous, self-organizing within groups, self-governing during the observation process, and examining the administrative system as an interconnected web (Dawoody, 2011). The educator's role was to be a facilitator in order to guide the observational trajectory. In serving as a facilitator, the educator became a strange attractor (Gleick, 1988), thereby creating instability within the status quo of the members' observation that eventually led toward the emergence of new form of observation that is complex, in-depth, holistic, and comprehensive (Wheatley, 2006). This new form of observation and the resulting awareness identified internal patterns of adaptation (Juarrero and Rubino, 2008) within the agents through networking and engagement. Participants acted as a network in order to observe public policy as a global complex system (Miller and Page, 2007). The autonomous and empowered members in Group B and while interacting with one other and perceiving their subjective views were encouraged and welcomed, they were able to demonstrate their potentials for generating findings in ways that was not possible in Group A whereby "control" was applied, the instructor acted as a guru (Caplan, 2002), and agents behaved as localized blank-slates in a top-down methodology.

Controlling the systemic order within an autocratically structured dynamics deprived members in Group A from autonomous decision-making process of the affected agents

(Gilbert, 2008). This rigidity had opposed internal changes necessary to deal with environmental changes outside the group (Vesterby, 2008) and rendered the observation process incapable of dealing with emerging conditions (Johnson, 2002). Because of this, the second strategy applied in Group B opposed control (Lewin, 1999) and encouraged the members' autonomy (Gilbert, 2008) and networking (Kelso, 1995). Under this strategy control shifted to influence with agents moving through the processes of observation to acquire awareness of emerging dynamics (Buchanan, 2003).

In relation to Breaking the Whole into Parts, the linear strategy applied in Group A had adapted the methodology of inquiry by breaking a system into parts, studying each part separately, and then composing all parts together in order to understand the whole (Wheatley, 2006). This methodology, however, was ineffective and observers missed the "bigger" picture when they broke it into parts (Dawoody, 2011). In order to understand the function of a system it must be studied as a functional whole (global context), not through isolated and separated local parts (Richardson, 2005). It is the interconnectedness of the various complements of a system while globally interconnected gives us an understanding of how the whole works and functions, not the other way around (Kauffman, 1995). The second strategy applied in Group B had resolved the linear dilemma with agents observing issues in public policy as a global system and within its entirety as series of local/global interactions and process (Barabasi, 2003), connecting both internal and external factors and players (Nowak, 2006), and observing local and global changes that morphed through phase shifts, continuous cycles of structural changes (Miller and Page, 2007), birth and rebirth (Smith, 2007), and equilibrium-disequilibrium-equilibrium (Prigogine and Stengers, 1984).

In relation to One-Best-Way, public policy is often examined according to one-best methodology. One-best-way finds its roots in Scientific Management (Taylor, 2010). This approach was also used in Group A, emphasizing time and motion, division of labor (such as assigning team leaders, moderators, and presenters in groups), breaking the system into localized parts and then analyzing each part independently, managing information and its flow, and emphasizing bureaucratic structures over processes, methods over substance and instrumentalism over human factor (Dawoody, 2011). This approach stood in contrary to common sense. How could a single methodology apply to all areas in public policy that operate within a global dynamic? How could one tool be adequate to be used in all applications? The complexity-based model in Group B offered members a new direction. It was perceived as a perspective that opened up possibilities for consideration of multiple universal perspectives and unexpected orders (Wheatley, 2006). In Group B, there was no one-best-way. Instead, observation emphasized the approach of "it depends", especially when every situation and condition examined within a global context was different and unique that required unique observation and solutions (Lewin, 1999). "It Depends" lacked control, rigidity, top-down, and one-size-fits-all methodology.

The application of complexity dimensions to the observation strategy for Group B had utilized the Agent-Based Model instead of one-best-way approach (Gilbert, 2008). Each

agent in the group was autonomous and interacted with other agents and the environment outside the group through networking. Each agent had the potential of influencing the entire network as well as other associated networks in the environment, benefiting from the "butterfly effect" in which a single event can be dramatically magnified into an exponentially increasing dynamic. Within this transformation, both the agent and the network went through self-reorganization and restructuring in order to cope with the changes in the environment (Goldstein, 1994). Within this model, there was no starting or ending point, top-down relationships, control, or one-size-fits it. Each event that was observed by any agent in the network was the shared experience of the entire network (Newman, Barabasi, and Watts, 2006). Solutions were applied as situation dictated and required by each autonomous agent. Decisions were also made by each agent autonomously and while in cooperation with other agents in the network. These decisions were process-based and responded to changes both internally within the group's global observational dynamics (Hazy, Goldstein and Lichtenstein, 2007).

In relation to Prediction and Planning, in a world of uncertainty we can no longer rely on a naïve confidence that long term results can be accurately predicted (Strogatz, 2000). Instead, the emphasis needs to shift to a much greater flexibility which prepares any current structure to respond to unprecedented changes (Dawoody, 2011). When changes occur in the environment (whether local or global), we need to allow a dynamic system the capacity to change from within to the degree of collapsing its existing order in order to for the new order to emerge (Vesterby, 2008).

Lorenz's butterfly effect teaches us that small changes within the initial conditioning will result in larger changes in the longer trajectory of a dynamic system's morphology (Lorenz, 1996). Since many forces interplay in the system's morphology, attempting to map out its long-term trajectory is fruitless because such a trajectory is always changing due to the constant interplay of internal and external forces (Saunders, 1980). In public policy, Lorenz' formula holds. If it is fruitless trying to predict the weather accurately beyond five days, it is also fruitless trying to predict changes in policy dynamics beyond the foreseeable future. This will also negate the necessity for long-term planning (Juarrero and Rubino, 2008). Instead of prediction and long-term planning, complexity moves us to anticipation and prepares us live in-the-movement (Richardson and Goldstein, 2007). The outcome of this was to accept the unexpected consequences, acknowledge the uncertain outcome of deterministic system, and include patterns of observation in uncovering the processes of change within an interconnected global network (Kelso, 1995).

In relation to Clock-Wise Movement, the linear application in Group A described a phenomenon clock-wise. Time and motion, according to this model were reversible (Hawking, 1998). A phenomenon was reduced to localized parts, functions, and building blocks (Wheatley, 2006). The complexity-based application in Group B, however, did the opposite (Dawoody, 2011). It welcomed pluralistic and multi-dimensional global view of an observed phenomenon (Lewin, 1999). Time and motion, according to the complexity-based model were irreversible. The main prism of such approach was that simple local systems

demonstrated complex global behaviors which were self-organizing (Morcol, 1999). The Arab Spring is an example of such localized systems with complex global behavior.

Self organization is the idea that living systems are capable of self-organize themselves in ways that all their components and processes can jointly produce the same components and processes as autonomous agents (Vesterby, 2008). This concept is also known as autopoiesis (Maturana and Varela, 1991). A key notion of this concept is self-referentiality (Sandri, 2008). The idea of self-reference designates the unity that a dynamic system is for itself, and that unity can be produced through relational operations (Little, 1999).

Autopoiesis and self-referentiality cannot be observed clock-wise. They must be understood within processes of change that are multi-dimensional, multi-layered, multi-directional, and continually morphing in a state of flux within an irreversible trajectory of time and motion. Group B followed this multi-dimensional, multi-layered, and multi-directional trajectory of irreversible movement in time. Group A, however, and by observing public policy clock-wise, had deprived its members seeing the entire encompassing picture of public policy and captured only a glimpse of its trajectory within limited sectional aspect that was both incomplete and inadequate.

In relation to Artificial Engineering, linearity is the science of mapping events along a localized linear line. Causal relations between these events are singular. There is corresponding elements along the line between events and their environments. However, emphases are on gravity, inertia, control, goals, future, and predictability (Wheatley, 2006). The line has both starting and ending points and it is one directional (Dawoody, 2011).

In Group A, members observed linear trajectories adhering to rigid structures for the purpose of setting goals to localized projects (Morgan, 2006). However, when the structural elements in these projects were incapable of dealing with continuous global environmental changes, more modifications (artificial engineering) were induced in order to sustain these projects beyond their natural lives (Saunders, 1980). Emphases in Group B, on the other hand, were on synergy, in-the-moment, self-organization, relationships, patterns of similarities and differences across time and space, mutual causality, awareness, and transformation through emergence (Juarrero and Rubino, 2008; Nicolis and Prigogine, 1989). Instead of a line, there were universal loops in the agents' observations and analyses. Agents in Group B utilized networks and interconnected dialogue with one another (Brown, 1995). Interactions with the global environment were on-going based on continuous relationships that the agents had established within a global network of observers (Johnson, 2002). Changes that took place outside the group acted as "kicks" to generate changes within the group's observational dynamics and internal dialogue. Communications, as such, was based on positive and negative feedback (Morgan, 2006).

Environmental kicks were received by the members in Group B through the group's sensory receptors (personal relationships, professional association, and ICT) which acted as strange attractors in order to prepare the group internally to reshuffle its internal dynamics and change its older to correspond with global changes. If the internal order in

the group was incapable of change, the group's entire structural order had to collapse in order to allow for a new structural order emerge and deal with the new environmental changes (Prigogine and Stengers, 1984). Sustaining the older structures through artificial engineering may had bought the group some time, but it would not prevented its ultimate collapse (Brown, 1995). Group A, instead, had refused the concept of collapse in totality and focused instead of series of modifications to its group dynamics and project goals.

Without the collapse of older structure there will be no birth of a new order. This concept is also referred to as bifurcation (Kuznetsov, 2010), and translated in phase shifts in the order of the system's dynamics (Wheatley, 2006). As the self-organizing order emerges out of the interaction of elements within the system, the system own parameters become unstable and the older order starts to collapse (Brem, 1999). Public policy must be understood according to this perspective in order to safeguard it from costly errors of resisting change or attempting artificial engineering (Richardson and Goldstein, 2007). This is what Group B had understood best and was ready to apply to their project and anticipate the consequences of collapse.

In relation to Instrumentalism, in Group A, the "instruments" used for the study of public policy became the ends of the group's function (Dawoody, 2011). The purpose of the study or the administrative function was no longer considered to be the objects of the performance. Rather, instrumentalism on its own emerged both as means and the ends (Setiya, 2010). This approach created divisions, rifts and conflicts among members that diverted their focus from stated goals toward the secondary issue of "tools." Group B, on the other hand, regarded itself as part of the process. Instruments were interactive parts of observations, not independent of it. The validity of instrumentalism held true as long as it was useful to the observation process. It did not replace the process nor did it become its goal (March and Simon, 1993). Instrumentalism, in Group B, was part of the process evolving toward better observance of global complex changes (Wheatley, 2006). Most importantly, members of the group put themselves within the process of pattern-forming as tools and transformed as well during their observation of the phenomenon.

In relation to One-Dimensionalism, linearism is based on one-dimensional approach toward observing a phenomenon locally (Dawoody, 2011). Within Group A there was no room for subjective views or pluralism of ideas. Possible interpretations outside the group collapsed into one localized linear approach in sake of one-dimensional observation (Simon, 1997). Group B, on the other hand, looked at a dynamic system as a composite of interconnected global relationships (Miller and Page, 2007). What the contrast between Groups A and B had demonstrated is that public policy suffers greatly if observed solely through a strict localized linear approach. The world of policies and governments, according to Little (1999) is unclear, interconnected, complex, often conflicting with top-down systems of accountability that are easily transformed into constraints. As such, this world produces policies that are inherently less responsive, less effective, less local, and less efficient. Any attempt to observe this uncertain world and

its policies through predictable localized lenses will be pure theoretical and lack validity in the real interconnected world. Group B emphasized on welcoming uncertainty and the shade of "gray" into its global observation and shy away from abstract (Wheatley, 2006). Group members learned to shift their attention toward interconnected global process and patterns building, chance, phase shifts, coordination, multiple binders (strange attractors), collapse of older orders and welcoming the emergence of new, random structures and processes both on local and global levels (Harrison, 2006). This type of observation and examination is self-transcending, self-organizing, irreducible, unpredictable, incommensurable (does not have common measures), and evolving (Johnson, 2002).

5. Conclusion

There are clear differences between public policy systems in different cities, counties, states, nations, and regions. In incorporating complexity dimensions to the understanding of public policy on each of these levels, the systemic behavior of these policies can be better understood while operating within its global context. The theme of "think globally, act locally" will then come alive and the complexity of a dynamic system is better observed.

Complexity dimensions can strengthen the traditional observation and examination strategy of public policy by tapping in to areas that the strict localized linear application is incapable of explaining. This is due to the complex nature of public policy itself. In doing so, new models can be developed in order to move our understanding of public policy toward new awareness and enable observers understand the nexus between a system and its complex global environment. Such an observation will also transform us into global participant-observers. To this end, this paper recommends the following as part of a new strategy in observing public policy as a function of a complex global network:

1. Encouraging policymakers, public administrators, researchers, analysts, educators, and academic institutions transform their inherent localized linear observation and methodology to properly adapt dimensions from the complexity sciences.
2. Establishing a symbiotic relationships and engagements between linear and non-linear applications to emerging issues and systemic analysis within a global context.
3. We ought to be comfortable in simultaneously inhabiting both the linear and complex domains and offer complexity analysis and solutions prior to crisis both on local and global levels.
4. We need to train policymakers, public administrators, educators, and members of the community avoid control, predictability, the use of catalyst as cause, explaining systems through events (especially last events), or the low degree of interaction among components in a system.
5. We ought to be comfortable with the absence of visible causal links between elements or masking a high degree of interdependence and extremely low predictability.

6. We need to welcome randomness, uncertainty, and variation as the source for information.
7. We need to allow for volatility to take place in order for the complex system self-organize itself.
8. We need to avoid artificial suppression of volatility as well as artificial engineering of any sort and allow for collapse to occur naturally. This requires us welcoming collapse as a natural consequence in system morphology, instead of massive blowups.
9. We ought to exposing the illusion of stability and allow the system's global booms and busts.
10. We need to welcome conformity with the state of nature of complex global systems, tolerate systems that absorb our localized imperfections rather than seek to change them, and allow uncertainty and low probability risks to be visible.
11. We ought to avoid confusing one local environment for another.

Author details

Alexander Dawoody
Marywood University, USA

6. References

Albert, D. (1994). "Bohm's Alternative to Quantum Mechanics." *Scientific American*, 270(5):58- 67.

Barabasi, A. (2003). *Linked*. NY: Plume.

Brem, R.J. (1999). "The Cassandra Complex." In G. Morcol & L. Dennard (ed), *New Sciences for Public Policy and Policy, Connections and Reflections*, 125-150. Burke, VA: Chatelaine Press.

Brown, T.A. (1996). "Nonlinear Politics." In G. Morcol & L. Dennard (ed), *New Sciences for Public Policy and Policy, Connections and Reflections*, 119-137. Burke, VA: Chatelaine Press.

Brown, C. (1995). *Chaos and Catastrophe Theories*. Thousand Oaks, CA: Sage.

Buchanan, M. (2003). *Nexus*. NY: W.W. Norton and Company.

Caplan, M. (2002). *Do You Need a Guru? Understanding the Student-Teacher Relationship in an Era of False Prophets*. London: Thorsons.

Capra, F., A. Juarrero, and J. Van Uden. (2007). *Reframing Complexity*. Mansfield, MA: ISCE Publishing.

Capra, F. (2004). *The Hidden Connections*. NY: Anchor Books.

Capra, F. (1991). *The Tao of Physics: An Exploration of the Parallels between Modern Physics and Eastern Mysticism*. Boston: Shambhala.

Chorpa, D. (1997). The Return of Merlin. NY: Random House.

Cowie, A. (2004). "Surviving Change: Building Redundancy into the One System that Never has Backups: the Human System." *Operational Dynamics*, Available at:

http://www.operationaldynamics.com/reference/papers/SurvivingChange/sixteengon2.jpg

Dawoody, A. (2011). "Teaching Public Policy as a Nonlinear System." *Journal of US-China Public Administration*, V (8)4: 372-386.

Dennard, L. (1996). "The New Paradigm in Science and Public Policy." *Public Administration Review*, 56(5):495-499.

Elliot, E. & D. Kiel. (1996). *Chaos Theory in the Social Sciences*. Ann Arbor: The University of Michigan Press.

Evans, K. (1999). "Imagining Anticipatory Government." In G. Morcol & L. Dennard (eds.), *New Sciences for Public Policy and Policy: Connections and Reflections*, 195-220.

Burke, VA: Chatelaine Press.

Gilbert, N. (2008). *Agent-Based Model*. Los Angeles: Sage.

Gillespie, M. (1999). *The Aesthetics of Chaos*. Gainesville, FL: University Press of Florida

Gleick, J. (1988). *Chaos: Making a New Science*. NY: Penguin.

Goldstein, J. (1994). *The Unshackled Organization*. Portland, Oregon: Productivity Press.

Guastello, S. (2002). *Managing Emergent Phenomena*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Harrison, N. (2006). *Complexity in World Politics: Concepts and Methods of a New Paradigm*. Albany, NY: State University of New York Press.

Hawking, S. (1998). *A Brief History of Time*. NY: Bantam Books.

Hazy, J., J. Goldstein, and B. Lichtenstein. (2007). *Complex Systems Leadership Theory*. Mansfield, MA: ISCE Publishing.

Johnson, S. (2002). *Emergence*. NY: Touchstone.

Juarrero, A. and C. Rubino. (2008). *Emergence, Complexity, and Self-Organization*. Goodyear, AZ: ISCE Publishing.

Kaplan, D. and L. Glass. (1997). *Understanding Nonlinear Dynamics*. NY: Springer.

Kauffman, S. (1995). *At Home in the Universe*. NY: Oxford University Press.

Kauffman, S. (1993). *The Origin of Order*. NY: Oxford University Press.

Kendall, B., W. Schaffer, C. Tidd, and L. Olsen. (1997). "The Impact of Chaos on Biology: Promising Directions for Research." in C. Grebogi and J. Yorke (ed), *The Impact of Chaos on Science and Society*, 190-218. Tokyo: United Nations University Press.

Kelso, J. (1995). *Dynamic Patterns*. Cambridge, MA: MIT Press.

Kiel, D. and E. Elliott. (1997). *Chaos Theory in the Social Sciences*. Ann Arbor: The University of Michigan Press.

Kiel, D. (1999). "The Science of Complexity and Public policy." In G. Morcol and L. Dennard. (ed), *New Sciences for Public Policy and Policy*, 63-80. Burke, VA: Chatelaine Press.

Kuznetsov, Y. (2010). *Elements of Applied Bifurcation Theory*. NY: Springer.

Lewin, R. (1999). *Complexity: Life at the Edge of Chaos*. Chicago: The University of Chicago Press.

Lindblom, C. (1959.) "The Science of Muddling-Through." *Public Policy Review*, 19(1):79-88.

Little, J. (1999). "Governing the Government." In G. Morcol and L. Dennard (eds.), *New Sciences for Public policy and Policy: Connections and Reflections*. Burke, VA: Chatelaine Press.

Lorenz, E. (1996). *The Essence of Chaos*. Seattle: University of Washington Press.

March, J. and H. Simon. (1993). *Organizations*. Hoboken, NJ: Wiley-Blackwell

Maturana, H.R. and F.J. Varela. (1993). *Autopoiesis and Cognition: The Realization of the Living*. NY: Springer.

Miller, J. and S. Page. (2007). *Complex Adaptive Systems*. Princeton: Princeton University Press.

Morcol, G. (1999). "New Sciences for Public policy and Policy." In G. Morcol and L. Dennard (eds.), *New Sciences for Public Policy and Policy: Connections and Reflections*, 1-62. Burke, VA: Chatelaine Press.

Morgan, G. (2006). *Images of Organization*. Beverly Hills, CA: Sage Publications.

Newman, M., A. Barabasi, and D. Watts. (2006). *The Structure and Dynamics of Networks*. Princeton: Princeton University Press.

Nicolis, G. and I. Prigogine. (1989). *Exploring Complexity*. NY: W.H. Freeman and Company.

Nowak, M. (2006). *Evolutionary Dynamics*. Cambridge, MA: Harvard University Press.

Overman, S. and T. Loraine. (1996). "The New Sciences of Administration: Chaos and Quantum Theory." *Public Policy Review*, 56(5): 487-491.

Prigogine, I. (1996). *The End of Certainty*. NY: The Free Press.

Prigogine, I. and I. Stengers. (1984). *Order out of Chaos*. NY: Bantam Books.

Richardson, K. (2005). *Managing Organizational Complexity*. Greenwich, CT: Information Age Publishing.

Richardson, K. and J. Goldstein. (2007). *Classic Complexity: From the Abstract to the Concrete*. Mansfield, MA: ISCE Publishing.

Ruelle, D. (1993). *Chance and Chaos*. Princeton: Princeton University Press.

Sandri, S. (2008). *Reflectivity in Economics: An Experimental Examination on the Self-Referentiality of Economic Theories*. Physica-Verlag HD.

Saunders, P.T. (1980). *An Introduction to Catastrophe Theory*. NY: Cambridge University Press.

Setiya, K. (2010). *Reasons without Rationalism*. Princeton: Princeton University Press.

Simon, H. (1997). *Administrative Behavior*. NY: Free Press.

Sole, R. and B. Goodwin. (2000). *Signs of Life*. NY: Basic Books.

Smith, L. (2007). *Chaos, a Very Short Introduction*. Oxford: Oxford University Press.

Strogatz, S. (2001). *How Order Emerge from Chaos in SYNC*. NY: THEIA.

Strogatz, S. (2000). *Nonlinear Dynamics and Chaos*. Cambridge, MA: Westview.

Taylor, F. (2010). *The Principles of Scientific Management*. General Books LLC

Taleb, N. and M. Blyth. (2011). "The Black Swan of Cairo." *Foreign Affairs*. V(90)3: 33

Vesterby, V. (2008). *Origins of Self-Organization, Emergence, and Cause*. Goodyear, AZ: ISCE Publishing.

Wheatley, M. (2006). *Leadership and the New Science*. San Francisco: Berrett-Koehler Publishers.

IntechOpen