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Complex Constructions of Complex Crises: A Sociocybernetic View of Multiple Observations

ABSTRACT

The purpose of this paper is to put forward emerging ideas from a social science of complexity (sociocybernetics) that critically challenge the way we think about social constructions and society generally. There are multiple social constructions of the environmental crisis because there are many ways of *observing* crisis. To integrate multiple perspectives, we must account for the observers that construct them. Normal western science is not adequate for this task. Alternatively, a theory of the observer must be premised upon a social science of complexity because disorder, not order, is the dominant feature of human events.

Introduction

Simplicity, linearity, and predictability were once the norm in Western science studies of the environment. Recent developments in complex systems thinking have challenged this approach. Theories of emergence, self-organisation, autopoiesis, and attractors, to name a few, take paradox, unpredictability, non-linearity, and complexity as starting points for understanding the environment. Multiple constructions of the environment and its crises have emerged that confound normal science approaches. Reconciling these multiple constructions within normal science is difficult, if not impossible. The problem herein is a 'problem of reference.' That is, given complexity, what is the foundation of our knowledge of multiple constructions of the environmental crisis?

Normal science is a cautious, analytic approach pre-occupied with understanding social order that leaves little if any room for complex social issues (Kuhn 1970). As described by Kuhn, normal science is a puzzle-solving approach in which it is assumed the puzzle is soluble. Unsolved problems are seen as anomalies. Subsequently, areas of study and theory grow steadily and cautiously, cultivated within a paradigm of theoretical concepts approved by scientists in the pertinent field, including methods and models.

The conservative, closed nature of normal science is not the primary concern of this paper. Most critically, normal science approaches constrain our ability to deal with multiple constructions of environmental crises because it provides only one point of reference: the subject. Segal (2001:133) highlights the essence of the problem. He argues that the subject-object position is only ontological – it will not address itself to how things come about. Reality is taken as objects observed by a subject. So long as the ontology of

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social theory rests upon subject-object as its point of reference, social theories are constrained to describing the object.

An alternative to normal science approaches is required to reconcile multiple constructions of the environmental crisis. The challenge is not to ontologically re-shuffle post-modern conceptions of the 'subject' to accommodate multiple constructions. Rather, the challenge is epistemological: to find an alternative to the 'subject' as our reference for knowledge of multiple constructions. Meeting this challenge requires a critical and radical point of reference. Such a paradigm is emerging within sociocybernetics¹, the study of complex social systems. In this paper Niklas Luhmann's theory of social systems is used to account for multiple constructions of the environmental crisis. Luhmann's theory posits that there are multiple constructions because there are multiple observers, i.e., multiple observing systems. The operative mandate is: observe the observer.

Ecological Integrity: Multiple Constructions of the Environment

The way we construct the environmental crisis is contingent upon how we observe the environment. A look at the evolving conception of ecological integrity illustrates the interconnection. There have been distinct shifts in the way ecological integrity has been conceived (Kay et al 2001). Kay et al define three models of ecological integrity (and propose a fourth). Each model is predicated on a different construction of the environment. The particular distinctions of the models are not as important here as the shifts that take place through the evolutionary process of moving from one model to the next.

In the first model of ecological integrity, the 'wildlife-normative' model, there is a clear division between science, society, and the environment. It was also believed that scientists could prescribe an appropriate balance between human areas and pristine areas (i.e., untouched by humans) based on quantitative measurements. This model portrays a deterministic approach to management of the environment in which crisis is understood as a decline in the percentage of pristine systems. As determinism waned a second model emerged: the 'systemic normative' model. The notion of pristine areas was replaced by complex ecosystems. The divisions among society, experts, and the environment were moderated by ethics. Adaptive management was focussed on states of ecosystem with integrity. Crisis was seen as a failure of management to minimise the threat of human systems to natural systems. In the third model, the 'systemic-humanistic' model, we can see a significant shift away from "expert management" of ecosystems. Adaptive strategies are predicated on preferred states of ecosystem health. This is achieved not by rational science but through the negotiation of goals and objectives in a broader social context. The expert has been replaced by the narrator/facilitator. The environmental crisis centres upon conflict over preferred states, i.e., multiple constructions of preferred states – and crises.

The shift from a positivist conception of a pristine environment has been facilitated by a greater reliance on social processes (e.g., facilitation, consensus) and human values. There has been a corresponding shift from deterministic control to adaptive management, from predictability to unpredictability. These conceptual shifts within constructions of ecological integrity reflect worldviews increasingly conditioned by uncertainty. At a fundamental level accepting uncertainty is part of coming to terms with the ontological

¹ Information is available at the official Sociocybernetics website at <http://www.unizar.es/sociocybernetics>. Sociocybernetics is a recognised Research Committee of the International Sociological Association.

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constraints of normal science when dealing with complex objects. Among other things, uncertainty sensitised scientists to the influence and role of human values within the scientific process. As a result concepts like participation have been reified as principles of scientific methods. But this only obscures the problem of reference.

Complex Social Systems: Observe the Observer

Social theorists have often pointed to the limitations of normal science approaches in dealing with complex social issues (e.g., Wilkinson 1970; Bernard 1973; Boudon 1984; Price 1997; Turner 1997). Wilkinson (1970), for instance, stated that a theory of social order is hamstrung from the outset because disorder, not order, is the dominant feature of human events. Social science, for the most part, remains a study of social order.

Alternatively, *what if* we choose complexity as a foundation for social science? *If* we follow this line of inquiry, *what* are the implications for social constructions? Effectively, the inquiry into multiple constructions of the environmental crisis shifts from an ontological inquiry of the environmental crisis to an epistemic inquiry about how we have knowledge of the environmental crisis. In other words, the inquiry has become a ‘problem of reference.’ In normal science, the observer is the subject and the observed is the object. A social science premised upon complexity replaces the subject-object view of reality with self-referential observations, i.e., the observer is implied in the observation (Luhmann 1995).

Luhmann (1995) argued that Husserl, in *Fifth Cartesian Meditation*, formulated the problem of reference very clearly. Husserl made it impossible to deny the problem of “intersubjectivity” any longer. Husserl’s phenomenology began with a fundamental unity of self-reference and reference to others. Therefore, Luhmann argued, there can be no “intersubjectivity” on the basis of the subject.

“But the staggering naivete, with which sociologists (Durkheimians, social phenomenologists, action theorists—it makes no difference) have been content with the statement that, after all, there are such things as subjects, intersubjectivity, the social, and socially meaningful action, without anyone seriously questioning this, should not be accepted anymore. The significance of the figure of ‘the subject’ (in the singular) was that it offered a basis for all knowledge and all action without making itself dependent on an analysis of society.” (Luhmann 1995:xli)

Luhmann learned from Husserl that the analysis of society cannot be answered by beginning with a concept of the subject that does not account for self-reference. After Husserl, the ‘problem of reference’ must be posed as the problem of the operative processing of the difference between self-reference and reference to others” (Luhmann 1995:xli), not the ‘subject.’

Luhmann’s general theory of social systems, unlike phenomenology, does not attempt to resolve the paradox and tautology of self-reference. Rather, self-reference is taken as the point of reference for knowledge. There is no subject because there is no external observer: self-referential systems replace the subject as points of reference. That is, self-reference is a basal condition for both constructing and observing the environment. Further, how a self-referential social system constructs the environment is implied in how

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the system constructs the crisis. How this happens may be understood as a shift from first-order observations of the environmental crisis to second-order observations.

Constructions of the environmental crisis have thus far been viewed as first-order observations. That is, an observer (the subject) observing an object. Alternatively, a second-order observation takes a step back from this position. In second-order cybernetics the aim is no longer to construct a theory of observed phenomena but to include the observer in the domain of science (Umpleby 2001:89). This marks a difference between first-order observations of constructions that *describe* the environmental crisis and second-order observation of social constructions recognising that a describer (i.e., the observing system) is implied in the construction. One is no longer seeking to understand objects, but seeking to understand the observing system.

Until recently systems have been considered either closed or open. Closed systems are consistent with mechanical systems: internally defined without any reference to its environment. Environment is used here not as *the* environment, but as the system's environment. In open systems the distinction between systems and environment is a key feature. This informs such concepts as input and output, adaptation, and equilibrium. Complexity theory, including such concepts as self-organisation and emergent properties, are part of open systems thinking. Maturana and Varela's (1980; 1987) development of autopoiesis offered a new paradigm of systems thinking. An autopoietic system still receives input from the environment but has the ability to operate internally in such a way as to continuously re-create the whole, and of the whole to influence the interactions of the parts to that end. Systems may now be conceived as simultaneously open and closed, that is, they are organisationally closed and structurally open.

Luhmann uses autopoiesis, cybernetics, and phenomenology to construct a general theory of society comprised of observing systems. Society constitutes all social systems. All social systems are observing systems. The primary distinction that guides observation is system-environment. It is the system's ability to observe itself as distinct from its environment that makes it self-referential. The system-environment distinction is autopoietically reproduced so long as it remains meaningful. Using this approach means that understanding multiple constructions is constrained neither by a subject-object duality nor by a focus upon order. To reconcile multiple observations one must determine what self-referential distinction guides the observation of an observing system.

We have now landed firmly in the field of sociocybernetics. Sociocybernetics "stresses and gives an epistemological foundation" to a social science of complexity (Geyer and van der Zouwen 1992:95). A closer look at Niklas Luhmann's theory of self-referential social systems lends additional insight to how sociocybernetics informs multiple constructions of the environmental crisis.

Niklas Luhmann's general theory of social systems

Niklas Luhmann's theory of self-referential social systems is premised upon complexity. Because it is not possible at any moment to connect every element with every other element "complexity forces selections either for or by the system because all the possibilities that the world offers cannot be actualised, certainly not simultaneously and not even in time" (Bednarz 1988). Over time, relations among elements are embedded in the accumulation of shared meanings. From this, Luhmann builds upon a logic of operations

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based on communication. This is the basic definition and understanding of a social system based on communication. As explained above, each social system is an organisationally closed observing system. The following accounts for how and why constructions emerge within a social system.

Social systems function to process meaning through selective processes. When we communicate we are always making a selection among other possibilities; communication is always a reduction of complexity. Likewise, meaning is always contingent. The organisation and structure of social systems both guide and constrain human abilities to make sense of our experiential world, our constructions of reality. Communicative selection produces emergent order: it transforms an improbable order into a probable (functional) one.

Multiple observing systems have emerged through a process of societal differentiation. As social interactions increase, new social systems emerge to increase the societal capacity to process information. Today, functional systems (e.g., law, economy, education, religion, community, family, science) process the meaning of society in their own terms, but no system binds another. This is why and how multiple constructions of the environmental crisis are possible within this process of societal evolution. The economic system, for example, is an organisationally closed (autopoietic) system. It only constructs the environmental crisis in terms of to pay/not to pay. Similarly, the law system only constructs the environmental crisis in legal terms, i.e., legal/illegal. In the absence of a single binding representation of society, the constructions of the environmental crisis become fragmented along functional lines.

The function to be performed by any social construction is to reduce complexity, to select from among a number of different possibilities. A meaningful grasp of the world requires a purely momentary grasp of the world (Luhmann 1989:17). The more complex the world turns out to be, the ability to communicate becomes improbable. What people need is a way to structure expectations to make it possible for selections made by one individual to be relevant to another. The construction of a 'crisis' reflects a particular aspect of uncertainty. Crisis means that a situation has reached a critical stage; that there is an impending change (Merriam-Webster Collegiate Dictionary 1993). But we don't necessarily know what this change will bring: crisis symbolises a state of uncertainty.

How does society cope with a future about which nothing certain can be discerned, only what is more or less probable or improbable? Constructions of crises function as part of society's 'immune' system: it enables society to deal with gross uncertainty without collapsing upon itself. Negation is very important in this process. The possibility of being 'wrong' can never be negated. "Negation is a reflexive process. This means, of course, that it can be applied to itself. Everything negated in an act of selection is negated only provisionally because this act can be negated and the initially negated possibilities re-actualised" (Bednarz 1988:6). The generalisation of symbols, such as "the environment" and "the environmental crisis," provides a medium additional to everyday language that increases the societal capacity for dealing with complexity.

Constructions achieve simplification by anticipating what is possible, by stabilising possibility. Truth, love, power, money, are outstanding examples of constructions that have evolved 'successfully.' Stabilising possibility both facilitates communication and acts as a catalyst for communication. Constructions, as generalised symbolic media of

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communication, make it possible to share meaning with different people in different situations, which in turn allows people to come to the same or similar conclusions.

The construction of the environmental crisis enables society to remain constant and to change at the same time. “Structures permit systems to maintain identity while their processes are relieved of point-for-point correspondences to changes in the environment, i.e. systems are not required to react instantaneously to every environmental change” (Bednarz 1990). Truth emerges as a heroic compression of uncertainty. Multiple constructions of the environmental crisis, therefore, are primarily semantic devices: “connections between the complexity of the world on one hand and the socially regulated processes for differentiating and connecting multiple selections on the other” (Luhmann 1979:48).

Conclusion

A sociocybernetic theory of self-referential social systems accounts for multiple constructions because there are multiple ways to observe the environmental crisis. In scientific terms, the theory’s ontological basis of self-referential, observing systems transcends the constraints of a subject-centred worldview. More pragmatically, a theory of multiple observing systems provides a common platform for debate among and across disciplines and practices. More than merely observing multiple constructions of the environmental crisis, Luhmann’s theory provides a theoretical framework that makes reconciliation of multiple constructions possible.

References

Bednarz, John Jr. 1988. “Information and meaning: Philosophical remarks on some cybernetic concepts.” *Humankybernetik* Band 29 - Heft 1 verlag modernes lernen

Bednarz, John Jr. 1990. “System and Time: The Function of Time in Meaning-constituting Systems.” *Kybernetes*

Bernard, Jessie 1973. *The Sociology of Community*. Glenview, Illinois: Scott, Foresman and Company.

Boudon, Raymond 1984. *Theories of Social Change: A Critical Appraisal*. Cambridge: Polity Press.

Published in *Handbook of Cybernetics* (C.V. Negoita, ed.). New York: Marcel Dekker, 1992 , pp. 95-124.

Kay, James K, David Manuel, and Dan Dolderman 2001. Presentation to Post Normal Science Discussion Group, University of Waterloo, Ontario, Canada.

Kuhn, Thomas 1970. *The Structure of Scientific Revolutions*.

Luhmann, Niklas 1979 (originally published in German, 1973). *Trust and Power*. Great Britain: John Wiley & Sons Ltd.

Luhmann, Niklas 1989 (originally published in German, 1986). *Ecological Communication*. Cambridge: Polity Press.

Luhmann, Niklas 1995 (originally published in German, 1984). *Social Systems*. Stanford: Stanford University Press.

Maturana, Humberto and Francisco Varela 1980. *Autopoiesis and Cognition*. Boston: Reidel.

Maturana, Humberto and Francisco Varela 1987. *The Tree of Knowledge: The Biological Roots of Human Understanding*. London: New Science Library, Shambhala.

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Merriam-Webster, Inc. 1993 (10th edition). *Merriam-Webster's Collegiate Dictionary*. Springfield, MA: Merriam-Webster.

Price, Bob 1997. "The myth of postmodern science," in Eve, Raymond A., Sara Horsfall, and Mary E. Lee, *Chaos, Complexity, and Sociology: Myths, Models, and Theories*. Thousand Oaks: Sage Publications.

Segal, Lynn 2001 Second Edition (1986). *The Dream of Reality: Heinz von Foerster's Constructivism*. Norton, NY: Springer-Verlag New York, Inc.

Turner, Frederick 1997. "Foreword: chaos and social science," in Eve, Raymond A., Sara Horsfall, and Mary E. Lee, *Chaos, Complexity, and Sociology: Myths, Models, and Theories*. Thousand Oaks: Sage Publications.

Umpleby, Stuart A. 2001. "What Comes After Second Order Cybernetics?" *Cybernetics and Human Knowing*. 8(3):87-89.

Wilkinson, Kenneth P. 1970. "The community as a social field." *Social Forces*. 48(3):311-322.