Limiting Complexity

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Prompt

While discussing the variety of submissions for this issue of *Complicity* a topic for this editorial suggested itself. Bill had made the comment:

> The issue I see is how much flexibility does the journal (we editors) wish to allow in the way authors use the word "complexity"? How far do we stray from the work complexity scientists are doing and the vocabulary they are using? As we (Bill & Donna) read and reread, such questions come to mind frequently (Email communication, May 14, 2009)

This prompted some thought. I (Deborah) am very much in favor of using the word "complexity" with great flexibility. For me the term "complexity" is much broader than complexity *science*. I am wholly with Nigel Thrift (1999) who, in his article *The Place of Complexity*, describes complexity as "… a structure of feeling in Euro-American societies which frames the world as complex, irreducible, anti-closural … producing a much greater sense of openness and possibility about the future." (p. 34).

My feeling is that if we (editors) hold authors strictly to the work and concepts of complexity *science* we are, in effect, attempting to colonize complexity, attempting to say *this* is (legitimate) complexity and everything else is *not* (legitimate) complexity. From a complex perspective, defining the limits of complexity in this way could be suicidal for the journal, because it closes rather than opens possibilities for scholarship in a field that is already very small.

I think of the work of the journal, therefore, as being about holding open a space of articulation or experimentation wherein the potential *and the limits* of complexity in education may be explored. Such a space would itself be "complex, irreducible, anti-closural … producing a much greater sense of openness and possibility about the future." (again, Thrift, p. 34).

For me, the value of the notion "complexity" lies in its *openness*. I believe it is not for us (editors) to specify in advance where the potential or the limits of complexity may lie. If such limits exist, they are not stable, static. They must be worked out, again and again, and what better place to do so than in "complex conversation"? If the journal can hold open a space where complex conversations may (be allowed to) take place, who knows what (limits) such complex conversations may open?

In sum, then, I think of "complexity" less as *an idea/thing* (a perfect object with distinct limits which we have to attempt to be true to) and more as a space or opening in which certain potentialities and limits may be worked out (or experimented with) through complex conversations.

Conversation

At this point in my thinking about Bill's query about how much flexibility we (editors) should allow in the way authors use the word "complexity"—how far we should stray from the work complexity scientists are doing and the vocabulary they are using—it seemed to me that an editorial piece on "the limits of complexity" would be appropriate for the July 2009 editorial. After all, in this issue, the word complexity *is* used rather broadly,[1] certainly more so than it has been used in previous issues, and I had in mind an editorial piece which provided some sort of justification for this broad use of the concept. I suggested this topic to Bill and Donna in an email which contained (approximately) the commentary in the "prompt" section, above; to which Bill replied:

> I like the idea of an editorial on the limits of complexity. May I and or Donna write a
> response? (Email communication, May 15, 2009)

And so this conversation was initiated or, at least, re-initiated, as it had already begun.

Bill (June 1, 2009)

Deborah is quite right, of course, in reminding us that any living organism—'tis interesting to conceive of the journal as living, indeed as having a space for feelings [its

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[1] For example Phil Bayliss's response to Karin deGravelles's piece draws upon Deleuze and Kristeva, whose work "traditionally" does not fall "within" the gambit of Complexity Theory "proper." This kind of "transgression" occurs throughout the 2009 July issue.

spirit?]—must needs be open not closed. However, every editor and every journal needs to handle the issue of Gatekeeping: quality, relevance, appropriateness, interest—all in this journal's Review Criteria. Deborah, in a previous editorial (Osberg, Doll & Trueit, 2008), argues (well, as always) for "gatekeepers" to be "gateopeners," ones who invite people (authors/responders) in for conversations. Such is much in keeping with the journal's "mission" statement: "enlarging the space of the possible" (see Davis, Phelps, & Wells, 2004; Osberg, 2009). In its short but vigorous life so far, I believe the journal (under various editors) has done just this. The journal has regular, featured (and refereed) articles, often with invited responses (designed to carry further the conversation started by the article). It also has a Semantic Play section (that we all might learn by the provoking play this section features). There is also a Vignettes section, oriented towards "evocative episodes via either prose, poetry, photograph, or drawing." Again provocative, these episodes are more "artistic" and personal than "academic." Finally, there are special issues devoted to the exploration of particular themes in education which we believe can be enlightened by being looked at from a number of perspectives. A multifocal perspective, if you will. To bring such a perspective to education is a radical departure from the single "method" way we have used for so many centuries (Doll et al., 2005; Meyers, 2003). As William Blake said two centuries ago: "May God us keep from single vision and Newton's sleep" (Letter to Thomas Butts, November, 22, 1802).[2]

Still, gate, open or closed, does imply an enclosure to which it is attached. Inside that enclosure — permeable, expandable I hope — resides the ground holding the roots of the journal's being. Its being, its beginnings, lie with the organization which calls itself Complexity Science and Educational Research (CSER)[3]. When CSER was first proposed as a title for this organization I queried whether calling Complexity a science was warranted. The name has stuck though and is used in a variety of ways, in a variety of fields. The issue of *Educational Philosophy and Theory* (Vol. 40, No.1, 2008) devoted to complexity and education is a fine contemporary summary of the complexity field and its relation to, and usefulness for, education. Melanie Mitchell's book, *Complexity*: *A Guided Tour* (2009), is also a good contemporary look at a field just emerging.

Melanie's book, comes from the Santa Fe Institute's view of complexity, where much of the modeling research is and has been going on. Ellen Goldberg, of the Institute, in her opening address to the first CSER conference, October, 2003, states that "there is no established definition of complexity or complexity science" (quoted in Davis, Phelps & Wells, 2004, p. 2). This statement is as true today as it was five years ago. The field of complexity is emerging, and those of us working in that field ("complexivists"?), realize that while some structure is needed, too tight a structure becomes rigidifying and *rigor mortis* sets in. It may be that a "structure of feeling" is just amorphous and ambiguous enough to be useful for the journal. I associate this structure of feeling with spirit — that vital integrity, undefined, felt which keeps any movement alive; indeed which is its "soul" (as is the soul/spirit of a person).

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[2] Those intrigued by Blake's visions might look at Keynes, 1980 and Damon, 1965.
[3] The CSER website can be found at http://www.complexityandeducation.ualberta.ca/conference.htm

As a field that is emerging, may I say struggling to identify itself, I see a distinction (not sharp but there) between the model makers and the metaphor users. The model makers come from the various institutes (of which the Santa Fe Institute is notable) that work on developing mathematical (and hence "true"?) models of ways chemical, physical, social systems adapt (and even transform themselves in such adapting) to change. These model makers wish to describe (and ultimately predict/control) the "reality" of the world in which we live. As models are necessarily simplifications of this world (Osberg, Biesta, Cilliers, 2008), they must of necessity be imperfect representations. As long as we realize the "map is not the territory" (to use a favorite phrase of Gregory Bateson (1988, p. 30) such maps, redrawn continually as we walk the territory, can be of use. Difficulties occur when we mistake the map (abstract and simplified) for living reality, or when we believe that the dynamics of say the B/Z reaction[4] is directly representational of dynamic activity in the classroom.

Metaphor users, as I view it, utilize particular aspects of complexity science/theory to serve as heuristics for insights into particular local issues/problems. Unlike a model, metaphor does not so much *represent* as it *generates*. A metaphor well used, helps us be creative with (or see differently) that which we are looking at. Such work is at the local level. Here the distinction between that which is complicated (hence can be taken apart/analyzed reductively) and that which is complex (hence cannot be reduced to simples—water being qualitatively different than its chemical components) is paramount.

Viewing education as a process of transformation, which I do, the study of complexity theory, especially as it is being developed by the modelers, the experimentalists, is of heuristic value to me. These modelers/scientists, while looking for a golden ring[5] I do not believe exists, do provide some insights I find useful as I think about issues of curriculum design and instructional "methods" (dare I use this word?). One is what *Thinking in Complexity* (Mainzer, 2007) means; that is, thinking in relational not factual or single idea terms (to return to Deborah's comments). Another is a realization that self-organization (a fascinating concept for teaching) does not just happen but happens under very specific (limited if I may) conditions. Many other insights could be mentioned: the need to develop a new (relational) logic, a questioning of cause-effect relations, the role of perturbation in encouraging learning, developing an epistemology of learning based on, or heavily influenced by, the notion of difference, and so on.

I am intrigued by and even committed to the Limits of Complexity, limits I believe need to be thought of as opening spaces for transformations.

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[4] Belousov–Zhabotinsky reaction or B/Z reaction is "one of a class of reactions that serve as a classical example of non-equilibrium thermodynamics, resulting in the establishment of a nonlinear chemical oscillator" (http://en.wikipedia.org/wiki/Belousov-Zhabotinsky_reaction).

[5] The reference here is to Richard Wagner's operatic Ring Cycle which consists of four operas, Das Rheingold, Die Walkerie, Seigfried, and Götterdämmerung; in the story, the Rheinmaidens guard secret gold, which can be fashioned into a ring powerful enough for its possessor to rule the world provided *he* gives up Love forever.

Donna (June 5, 2009)

My interest in complexity theory has less to do with whether complexity is a scientific or metaphorical representation of the world than how it might change the way we think about "reasoning the logic of things" (Peirce, 1992). Therefore I focus on relations, connections, interactions, especially in discourse. I puzzle over the issue of how I can develop, in my thinking, a view of the world, informed by science, enriched by metaphors, but a view that looks to patterns and dynamically self-organizing relations and how those relations might influence reason in representation.

Complexity *Is*. In response to the question, "What are the limits of complexity?" my response is that one might substitute the question, "What are the limits of God?" In my mind these questions are analogous. The limitations sit with us humans and our asking the question at all has to do with patterns of rational discourse: a perceived need to define. It seems to derive from the "discourse of modernism" (Reiss, 1982). How we see and represent the world and its functioning has been shaped by a skewed sense of reductive reason and humanism (Kauffman, 2008).

I agree with Deborah's idea of the journal providing a "space" or "opening" for working out "potentialities and limits" but I prefer to see that the journal—really, the result of interactions between editors, reviewers and contributors—exists as part of a network, as a node which is a site of further interactions. As such it is also a site of potential relations, connections, interactions. (*Space/opening*, it seems to me, can sometimes be vacuous).

In regard to the matter of how flexible the editors should be with the use of the word complexity, this seems, to me, a wrong-headed question. The question is not whether or not we editors *allow* flexibility. The difference between articles that make claims to complexity science and those that refer to Thrift's sense of a feeling of complexity is significant. Authors who make claims to a connection to complexity science would I think, need to represent complexity then as the scientists do.

Deborah (June 29, 2005)

As I reflect on the words of Bill and Donna, together with my own in the introduction to this editorial, I can't help but notice that these words do not merely *say something* about the concept of complexity (and its limits). These words also *do something* with the concept. My own words use the concept to justify using the journal as a space in which certain potentialities and limits may be worked out (or experimented with) through complex conversations. Bill's words, on the other hand, distinguish (repetitive) models from (generative) metaphors, and in so doing justify the metaphorical use of the scientifically generated and necessarily limited concept(s) of complexity. In contrast, Donna's words suggest that "limits" is a particular kind of human construct which has nothing to do with complexity (or God for that matter) and in so doing prompt us to reconsider the ground from which we question "the limits of complexity" (or anything else). In short, her words ask that we begin again with our doing, being and thinking.

But in putting it like *this*, in articulating our three commentaries in this section as I have here in this *particular* way (instead of any number of other possible ways) I have not only described/repeated/replicated (have I?) what each commentary performs, but added something else: a new performance. In this passage my words suggest that these three commentaries are not simply repetitions or representations of our (editors') thoughts. They are also active. They are *performances with words.* Performances are active/dynamic. With words we have willfully connected various concepts together to make an argument which will move or persuade our readers of one thing or another. Through these connected words we connect with our readers. In this sense, written into the act of representation (the act of cutting off, disconnecting, killing, pinning down, defining) is something far more dynamic, connecting, *and generative*. The (dead/limited/cut-off) content of "bare" words/descriptions/models must always be considered alongside their "poietic"[6] (living/engaging/connected/) performance. Furthermore, any attempt to read the living performance of words is another performance, another creative act: another production of *connections which perform*. It is this performative connectivity that gives life to words.

It turns out, then, that representation—cutting things off, and re-connecting certain things in a particular way with other things—cannot be separated from performance/poiesis. To say this differently, it is necessary to *limit complexity* (order it) to perform something with words. This brings me back to Bill—who states "I am intrigued by and even committed to the Limits of Complexity, limits I believe need to be thought of as openings spaces for transformations." For Bill moving forward requires us to be cognizant of the interactive relationship between limits and possibilities. This relational focus is important also for Donna, who states, "I focus on relations, connections, interactions." It is these very relations, connections, interactions that *limit* complexity—constructing it in certain ways and not others. Discourse is living because it is an act of creation, an act of putting things together *thus*.

What, then, of my original idea to use this editorial to explore "the limits of complexity"? Through actually exploring that idea with Bill and Donna (performing words for each other), we now find ourselves somewhere rather different than we originally intended (yet this place/space /opening/node is *strangely familiar* to all three of us). We are now at a space/place/opening/node where limiting complexity (closing/killing) is enabling complexity (opening/creating). The opening and the closing of possibility are inseparably caught up with each other. And we have a different title for this editorial: "limiting complexity" rather than "the limits of complexity."

We acknowledge that we have necessarily limited complexity (corralled it) in order to say what we have said. And in the saying of what we have said we acknowledge that we have been/are performing something. "Limiting" is a verb; we make the title work/perform, rather than simply describe/say. *The limits of complexity* pretends to represent something, while itself being passive. On the other hand, *limiting complexity* performs something. This concept—limiting complexity—is the articulation

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[6] *Poiesis* is etymologically derived from the ancient Greek term $\pi o\iota\acute{\epsilon}\omega$, which means "to make". This word, the root of our modern "poetry," was first a verb, an action that transforms and continues the world.

point (a "node" in Donna's terms?) of our words/ideas/arguments. It not only brings together everything the three of us have said, but articulates our words by allowing for their movement and connection. *It says/does what we say/do with our words*. With this in mind we invite you to read each of the articles presented in this issue as the performance (limitation/enablement) of complexity that it is.

Performance(s)

In our first feature article of the peer reviewed section of the journal, Xavier Fazio and Tiffany Gallagher gather convincing evidence to argue for the robustness of complexity theory for analyzing professional development collectives. In their response to these authors, Tom Kieren and Eliane Simmt strengthen Fazio and Gallagher's performance by adding a powerful example of teachers' meaning making and how the products of a learning collective co-emerge from the interactions and joint meaning making activities of its members. Our second feature article, by our very own book review editor, Darren Stanley, explores ways in which Ralph Stacey's notion of "complex responsive processes" plays out in the context of knowledge, knowing and understanding. While Stanley argues that Stacey's framework can be used as a powerful analogy for educators interested in "human knowledge and knowing" our respondent to this piece—John St Julien—adds an additional layer of complexity and depth by arguing that what Stanley has begun to uncover is something *far more powerful* than analogy. In the third feature article Karin deGravelles articulates concepts from chaos, complexity and postmodern sensibilities through Cunningham's recursive readings of Whitman to suggest possibilities for postmodern or nonlinear interpretive practices in which the search for meaning generates meaning rather than finding it. Phil Bayliss responds to DeGravelles' by bringing Deleuze and Guattari as well as Kristeva, and some sensibilities from Tibetan Buddhism, First Nations Nutka society and Mongolia to Karin's performance and in so doing he performs something else again. Finally, for this section, Teresa Dobson and Tammy Iftody create an argument for how complexity might inform teaching and engagement with literary art by examining Linklater's animation "Waking Life" from a complexivist perspective and recommending it as a focus for discussion in humanities education. Noel Gough responds to this piece by drawing attention to the limitations of using only a single text for this purpose, arguing instead for an "intertextual approach" that interprets any given text in terms of other texts.

In the *Semantic Play and Possibility* section of this issue, and continuing the theme of generative linking performances, we have two pieces, both collected and edited by Donna Trueit. In the first piece, Marg Sellers brilliantly juxtaposes one of Donna's earlier texts (previously published in this section of the 2006 issue of *Complicity*) and a new text of her own as she plays with Donna's text to see what "spaces of possibilities" this might generate. Following this playful performance, Lorelei Newton plays with various meanings of the concepts of validity and reflexivity to perform an argument for keeping open debate about how to assess quality, rigour, and robustness in research.

We have three *Vignettes* in this issue, all peer reviewed but collected in this section (rather then the main section of the journal) due to their imaginative/speculative, and

metaphoric potency. The first, a piece by Carolyn Mamchur and Linda Apps takes us on "a journey in search of a process." Next we have a piece by Lynn Fels who invites the reader to consider role drama as an embodied learning system. The section closes with a piece by Jerry Ameis, in which chaos theory is a metaphor for both designing research and examining findings.

We have five book reviews in this issue, collected and edited by our book review editor, Darren Stanley and the issue ends with two articles honouring Craig Newell, a well loved friend, participant in, and supporter of *Complicity*, who passed away shortly shortly after the Athens, Georgia Complexity conference in 2008.

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