

Guest Editor's Introduction:

The Politics in Complexity

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The increased visibility of complexity in the social sciences has raised questions about the ability of complexity theories to address political concerns. Many of these concerns are legitimate, particularly where complexity is portrayed as a superior naturalistic metaphysics of “life” which comes complete with a set of metaphors that can be used to legitimate certain social arrangements. In response to an article by Kevin Kelly in which complexity is portrayed in this way, Steve Best and Douglas Kellner (1999) rightly point out some of the shortcomings associated with this use of complexity and remark that this “uncritical approach to political realities and social power” is the “Achilles heel of complexity theory” (p. 155). However, while I have no problem with Best and Kellner’s assessment of *this genre* of complexity research in the social sciences, it is important to be clear that the genre is one that many who use complexity in the social sciences are themselves critical. Nevertheless, the objection raised by Best and Kellner a decade ago is relevant in that in *education* there is *still* very little work that draws on complexity to address education’s political concerns and in this regard complexity’s potential to be critical in an educational context is largely overlooked.

In this issue of JCACS we bring together seven papers which were initially developed for a symposium entitled *Complex Criticality in Educational Research* (presented in the Complexity SIG of AERA in April 2007). The symposium aimed to address the perceived lack of a “political

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focus” in complexity-and-education research in general and, accordingly, each of the papers presented in this issue articulates a way in which complexity can be “critical” in the educational domain. For readers of JCACS who may not be familiar with the language and logic of complexity, nor its applications in the social sciences, Nigel Thrift’s article *The Place of Complexity* (1999) and John Urry’s *The Complexity Turn* (2005) provide some valuable insights. Thrift (1999) 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)

Although supposedly originating in the natural sciences, this new “structure of feeling” which challenges Cartesian understandings that divide time, space and matter into object-like entities within measurable boundaries¹ and which concerns itself with non-linearity, unpredictability, emergence and self-organization is, as Urry (2005) puts it, now “doing metaphorical, theoretical, and empirical work within many social and intellectual discourses and practices besides ‘science’” (p. 2). Its movement into the social sciences, according to Urry (2005), took off in the late 1990’s following its endorsement by the Gulbenkian Commission on the Restructuring of the Social Sciences which advocated breaking down the division between “natural” and “social” science through seeing both characterized by “complexity.” At least 10 years earlier, however, in the early 1980’s educational researchers had already begun to explore the potential of complexity-based analyses for education. In particular, such work concerned itself with the implications for education of Nobel laureate Ilya Prigogine’s “science of dissipative structures.” For example in 1983, Small depicted man [sic] as “a dissipative structure within a larger system of education,” and later, a paper by Sawada and Caley was published in *The Educational Researcher* (Sawada and Caley, 1985) which described the science of dissipative

¹ Although Descartes is better known for his philosophy, his physics is by no means inconsequential. A concise survey of Cartesian physics can be found in Garber (1992) “Descartes’ physics”, in *The Cambridge Companion to Descartes*, ed., J. Cottingham. Cambridge: Cambridge University Press.]

structures as “a new metaphor for becoming in education.” For Sawada and Caley, this new metaphor would provide a way of thinking which would “illuminate long standing problems and issues in education” (see also Fisher, 1986). In a similar vein Bill Doll elaborated on this idea pointing out in his 1986 paper *Prigogine: A New Sense of Order, A New Curriculum* (reprinted in this volume) that Prigogine’s science of dissipative structures might be qualified as a new paradigm for education – one which moves thinking in education from a basis in measurement (and replication) to a transformative base. Doll’s subsequent work in this area has been and continues to be an inspiration to many who have taken an interest in complexity-and-education research although the field has developed in a wide diversity of ways in intervening years as educational researchers have drawn upon myriad “features” of complexity (see Cilliers, 1998, pp. 2-4, for a very brief description of ten features of complex systems) to address a broad range educational issues.

In his recursive retrospective in this issue of JCACS Doll, himself, reflects on his early 1986 piece drawing attention to the many influences which have affected his thinking and writing as complexity has become increasingly visible in the social sciences, which returns us to the reason for this issue in the first place. The increased visibility of complexity in the social sciences has introduced some concerns about (i) the *suitability* of complexity to deal with social concerns (see e.g., Chia, 1998) and, more specifically, (ii) the *ability* of complexity theories to address political concerns (see, e.g., Best and Kellner, 1999). One concern has been the claim that complexity provides a way of thinking which can finally unite the physical, biological and the social sciences. For example:

Dissipative structure theory is a powerful way of relating the physical, biological, and social sciences to a single functional system using the same terminology to describe processes at all levels within and between systems. (Sawada and Caley, 1985, p. 16)

Sceptics such as Chia (1998) have argued that this supposedly “unitary language” of complexity is inappropriate for dealing with social systems because it was developed as a science to quantify complex

physical processes, and as such is not well suited to address issues of “subjectivity, meaning, the limitations of language, and the essentially interpenetrative and transformative character of human experience” (p. 342).

This is an important argument as there *is* much work in the social sciences which envisions humans as self-organizing agents in complex (physical) systems in order to better understand (and hence manage) certain human social systems, such as classrooms and organizations. While many useful insights have been gained from this kind of approach (much human behaviour does seem to conform to complex, non-linear patterns and once this is understood, it is possible to manage such systems more appropriately) it can also be argued that human beings are not *merely* objects interacting with each other in a way that entails self organisation. Human beings are also more than this. We, as humans, are different from merely physical objects (such as water molecules) in that we attach symbolic meaning to our actions and to the “things” we interact with. We *interpret* that which we interact with. We form opinions and this affects our responses. This normative aspect *which cannot be extricated from human social systems* is altogether absent from physical systems. Because of this it is not immediately clear how the metaphor of physical complexity – which is devoid of the normative dimension – can be extended to human social systems in a way that addresses political and ethical (normative) concerns. However, as the papers in this issue make clear, this does not necessarily mean that complexity is unable to speak to the political aspects of complex human social systems. Indeed, as almost all the contributions in this issue of JCACS make clear, complexity is a useful tool for analysing *meaning itself* and it is in this regard that its potential to do political work in the educational domain comes into focus. In the first paper, *Beyond Simple Order: Complexity and Postmodern Politics*, Donna Trueit draws on Timothy Reiss to explain how the terms “politics,” “critic” and “critique” are discursive practices closely aligned with rational ideas about order. She argues that we use these terms in the context of maintaining a *particular* rational or political order (whatever it may be) and as such the terms fit within a modernist frame, i.e., one which draws on the logic of linear cause and effect, which is alien to the “complexity paradigm” (my term). Having outlined the modernist underpinnings of “criticality” she then draws on Peirce to argue that the

modernist understanding of the political has failed to adequately address issues around freedom, equality and democracy. A more adequate reading of the political, so she argues, can be found in the recursively relational logic of (Peircean) pragmatism. More specifically, she argues that the recursivity of the Peircean system means it can be understood as a complex or self-organizing system, one which does not operate in terms of the modernist logic of linear cause and effect, but in terms of a new recursive or emergentist logic. From this a new *post-modern* form of criticality – reflexive criticality – can be drawn, which in turn opens a different form of political engagement: one that is self-organizing, dynamically stable and emergent. Trueit then pushes this argument one step further, by pointing out that feminist poststructuralism, while being sensitive to emergence and the opening of as yet unimagined possibilities, remains incapable of reflexive criticality (postmodern politics) as long as it understands the notions of (i) the human subject and (ii) power as strictly discursive constructions. She argues that an understanding of these notions as strictly discursive forces the subject to be a passive recipient of action, and power to be the directionality of that action (something that happens *to* something else). In other words both human subjectivity and power are still understood in modernist terms, that is, as reified objects. It is in this regard, Trueit argues, that complexity theory can offer a useful heuristic to move beyond simple, deterministic conceptions of “natural” political order, to reconceive order – and hence the political – as that which is dynamically self-organizing.

In the second essay *Intent and Expression: Complexity, Ethnography and Lines of Power in Classrooms* Walter Gershon argues that the iterative, recursive and emergentist logic of complexity is useful for illuminating various lines of power captured within multiple layers and webs of meaning. In particular, he uses the logic of complexity in an ethnographic study in which he investigates the lines of power that contextualize everyday classroom interactions. Of particular importance to Gershon are the constructs of “intent” and “expression” which he understands as the primary tools by means of which we attribute meaning to human interaction. He argues that it is through analyzing expressions of intent which in turn solicit responsive expressions in a continuing recursive or iterative relationship that we are able to capture and make sense of complex human interactions. “By examining similarities and differences

within and between actors' actions, the expression of their intentionality, and the purpose or ideas they held when they acted, its intent, the researcher can use multiple iterations of expression and intent to understand the cultural precepts that make such interactions make sense to local actors" (p. 3). Gershon presents a case study which illuminates the usefulness of using intent and expression as (i) a means to understand the cultural meanings and patterns that render classroom interactions sensible and (ii) as a lens that enables its user to critically examine how lines of power operate in classrooms.

For Gershon, the value of the recursive and iterative logic of complexity is primarily in revealing lines of power in complex webs of meaning. In this regard the logic of complexity is understood as a means to analyse and interpret the world of meanings in particular social or cultural contexts. It is not the place of ethnography to comment upon the appropriateness of these power relations or suggest ways in which they can or should be altered but presumably once the power structures have been revealed through this kind of complex ethnographic study, the way is then opened for such power relations to be challenged and perhaps changed. In this regard, this kind of complex ethnographic analysis of the layers of meaning in human intents and expressions provides a useful point from which political action can then take place.

Jayne Fleener pursues a related line of argument in her piece entitled *Complexity and Postmodern Criticality: Moral Dimensions of Emergentist Research*. In the context of the aftermath of hurricanes Katrina and Rita along the Gulf coast of the United States in 2005 she explores ways in which postmodern or complex criticality can make a difference in the lives of those disrupted by the events and those that followed. She argues that it is only through the nonlinear, recursive and open-ended logic of complexity that we are able to become aware of the extent of the "unnaturalness" of this disaster (i.e., see the lines of power in the layers of meaning which contribute to its existence). Complexity, according to Fleener, enables us to understand events to be connected "not by chains of causality but layers of meaning, recursive dynamics, nonlinear effects and chance." For Fleener it is only through the language and non-linear logic of complexity, with its recursive dynamics, and sensitivity to the uncertainties in every situation, that we are able to begin making sense of "the layers of inequity and injustice and complexities of relationship that

are not easily understood using traditional modernist logic.” In Fleener’s analysis, “modernist logic” – which connects events by linear chains of causality, oversimplifying interconnected relationships and assuming a certain “given-ness” of the past, present and future – in many cases inhibited the possibility to make a positive difference to the lives of those most seriously affected by the hurricanes. When the non-linear logic of complexity is used to understand the dynamics of a social situation it becomes possible, according to Fleener, to make a difference in people’s lives, to question the structures, institutions, policies and politics that create our current social ecologies. While Fleener does not develop this point, she does appear to be suggesting that the logic of complexity is capable, also, of opening a space in which a better future can be created. Fleener labels this complex form of analysis and practice “postmodern or complex criticality” and suggests there are spaces for complex criticality in educational research.

Fleener’s analysis, for me, suggests that complexity is important *not only* for enabling us to become aware of the inhumanities of a linear, machine-like way of seeing and thinking, *not only* for bringing into focus and hence exposing lines of power. Its sensitivity to unpredictability, open-endedness and the genesis of the new, *also* hints at its potential to provide us with a way forward; one which allows for the unexpected. If this is the case, complex analyses would serve to open the possibility for something else to happen, something else which is as yet unknown, which cannot be known before the act of its coming into presence. In this regard, complex analyses of the layers of meaning in complex social structures and processes may be useful in helping us towards a better future, or at least away from a destructive or stultifying present.

In the fourth paper *Dialogic and the Emergence of Criticality in Complex Group Processes*, Donald Gilstrap provides support for the “criticality” of complexity theory in relation to group processes by arguing that Paulo Freire’s philosophical and methodological frameworks uniquely parallel the main concepts in Prigogine’s dissipative structures theory.

He begins by explaining how Freire’s understanding of critical thinking – which is linked to the recursive processes of connected knowing, problem posing, thematic investigation and dialogic – resonates with the nonlinear, recursive, and interconnected views of chaos and complexity science. For Freire, connected knowing transcends the

positivist (linear, deterministic) frameworks for knowledge seeking and focuses instead on how we come to make meaning in recursive communication with others. “Connected knowing” or meaning-making moves individuals away from communication patterns of (uncritical) reporting and (uncritical) “banking” of what is reported – which Apple contends are “empty conversations ... monologue masquerading as dialogue” (2003, p. 115, quoted by Gilstrap) – to a mode of communication in which we continuously re-create our own knowledge based on the viewpoints of others. Note that such a process of meaning-making involves a critically attentive attitude not only to others but also to one’s own voice. Gilstrap argues that when groups begin to communicate through the use of connected knowing, information begins to flow into and within the system, causing it to become an open complex system which is able to emerge into a different space of meaning. This understanding of meaning-making posits a view of knowledge (connected knowing) as transformative and emergent rather than incremental. It is the transformative nature of meaning making that enables the process of meaning making to be understood – at least in the Freirean sense – as critical.

As with the previous three contributions Gilstrap’s argument suggests that the “criticality” (in the political sense) of complexity becomes evident when ideas or “structures of feeling” (Thrift, 1999) from complexity theory are applied to the process of meaning making itself.

In a similar vein Sarah Smitherman Pratt addresses the question of complex criticality by examining the power dynamics of meaning making in constructivist theories of learning. In her paper *Complex Constructivism: Rethinking the Power Dynamics of “Understanding”* she examines what it might mean to “exercise understanding” from both modernist (deterministic) and postmodern (complex) perspectives. She argues that within the modernist interpretive frame the issue of understanding is imbued with a particular power dynamic: that of the “understander” (whose understanding is never questioned) and the “understandee” (whose understanding is always in question). In this regard the exercise of understanding is a colonizing act in which the teacher-understander seeks to bring “understandees” into her own internal representation of reality. It is always the intent of the teacher for the students to arrive at a certain location and this is the case regardless of whether s/he adopts a

“teaching as telling” (representational) or “teaching as leading” (constructivist) orientation. The teacher is always the one in control, always the one who knows best (this is what Freire speaks of as “banking education”). Smitherman argues, however, that while this power dynamic underpins constructivism as it is currently interpreted in educational discourse, constructivism can also be interpreted from a complex perspective. This complex interpretation of constructivism – “complex constructivism” – shifts the unequal power balance of understander/understandee by drawing on a different interpretation of several key themes connected with teaching. Smitherman mentions four of these: (i) the interpretation of difference, (ii) stages of development, (iii) predetermination and (iv) collective understanding. She argues that when these (and other) key themes in education are interpreted in complex rather than modernist terms, the act of understanding becomes a process of interpreting and making meaning in relational and temporal situations. Meaning in other words is created and re-created *together* (or, as Gilstrap would argue, through “connected knowing”). The unequal power relation of teacher as “understander” and the students as “understandees” is transformed as all cooperatively struggle with questions/issues for which the group as yet has no answer. In this sense complex constructivism opens a critical space in which the emergence of new understanding can take place. This, for Smitherman, is where the “criticality” of complexity can be found.

In the sixth paper, *The Logic of Emergence: An Alternative Conceptual Space for Theorizing Critical Education*, Deborah Osberg begins her analysis of the “criticality” of complexity by examining the idea of criticality itself. In this regard she focuses on a particular political project within modern Western thinking which focuses on the idea of going beyond whatever it is that limits our freedom. She argues that it is only when a distinction is made between (i) our understandings of the concept of freedom and (ii) our quest for freedom, that it becomes possible to see that modern Western society has pursued its (political) ideal of freedom through the vehicle of critical thinking in a number of forms, and when the “logic of complexity” is placed into this “critical milieu” its place within the project of modern Western critique comes into view.

Osberg focuses on three critical approaches to the ideal of freedom which have come into view since the 17th century, these being Immanuel

Kant's rationalism, neo-Marxist structuralism and Foucauldian poststructuralism, pointing out how the neo-Marxist position can be understood as a radical response to Kant's rationalism while Foucault's poststructural perspective posits an opening or deepening of Kant's rationalism as well as being "haunted" by Marxism. Having outlined the "logic" by means of which these three understandings of criticality operate, she then aligns Kantian and neo-Marxist positions with what she terms the ends oriented "logic of determinism" and the Foucauldian position with what she terms the "logic of emergence" in which the notions of ends has no place. The "logic of emergence" is then described as the fundamental logic of complexity – i.e., the logic underlying Prigogine's science of dissipative structures. In this regard, it becomes clear that complexity's contribution to the project of modern Western critique is that it provides the open-ended logic by means of which poststructural critique can take place. Osberg then goes on to explain how this poststructural or "emergentist" logic is able to provide a different space for theorizing critical education, one which escapes some of the criticisms lodged against critical pedagogy as being just another ends oriented tool for socialization. The logic of emergence (or poststructuralism), in contrast, provides a democratic space of renewal in which the possibility of thinking again cannot be foreclosed. Since the presence of a space of renewal is the *condition of possibility* of freedom, complexity, in this sense can be understood as a critical logic of freedom and as such is not only appropriate but crucial for dealing with the political and normative dimension inherent in human social systems.

Finally, in their article *The Death and Life of Great Educational Ideas: Why We Might Want To Avoid a Critical Complexity Theory*, Brent Davis and Dennis Sumara play "devils advocate" by arguing that while complexity theory and critical theory can, in a sense, be understood as having certain complementarities, there appears to be little that complexity can add to critical discourses that hasn't already been said by critical, political and poststructural theorists. This does not mean that complexity has nothing of its own to contribute to critical debate within educational research. Only that it is misguided to try to use it to do the same work that critical theories are currently doing. For this reason they argue that rather than attempting to align complexity with current critical theories (e.g., by focussing on the complexity of the normative world of symbols and

values, as I have argued is necessary if complexity is to be “critical”) it may be more fruitful to bring certain differences between complexity and critical theories into productive tension. What these authors have in mind is a productive tension between complexity’s framework(s) for *explaining the physicality of being*² and critical theory’s framework(s) for *interrogating meaning*.³ In this regard they cite Cohen and Stewart’s twin notions of *simplicity* (a process whereby a system of rules explores a fixed space of the possible) and *complicity* (a process in which totally different rules converge to enlarge the space of the possible) to argue that it is in the complicit space between complexity and critical theory that we find ourselves “complexly critical and critically complex.” The main point, for Davis and Sumara, is that when the physicality of being is viewed from the perspective of complexity, then complexity and critical theory are always already complicit because our meanings necessarily exist in complex (nested, co-implicated, ambiguously bounded, dynamic, etc) relationship with the world. It is in *this sense* (rather than the political sense which is the domain of critical theory “proper”) that Davis and Sumara are arguing that complexity is “inherently critical.”

In presenting these papers together in this issue of JCACS, we do not presume to have exhausted possibilities for the criticality of complexity, nor even answered the question (in any definitive sense) of whether or how complexity can be critical. We hope, only, to have provided a richer and perhaps more complex basis from which to explore complexity’s potential to contribute to the project of Western critique in general and the politics of education in particular.

² In other words, certain human and social phenomena (e.g. birth rates, fashion trends, cell phone use, etc.) follow “a curious mathematical consistency.”

³ They argue, further, that this would be particularly useful in terms of the constructs of (i) human nature, (ii) intentionality and (iii) responsibility which are common areas of interest to both domains.

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