

# *The Death and Life of Great Educational Ideas: Why we might want to avoid a critical complexity theory*

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## Introduction

In the early 1970s, Thomas Schelling (1971) created a fairly simple simulation that has come to be regarded by many as seminal to discussions of complexity. He was interested in the phenomenon of racial segregation in American cities. Specifically—and working against the grain of common sense—he wondered if racial segregation might actually have very little to do with racism.

Schelling's method was as unconventional as his thesis. Using the squares on a checkerboard to represent dwellings and differently colored coins to represent people, he began with "a fully integrated society" by randomly distributing the tokens over the board. He then "ran" a series of simulations that were organized around different assumptions. In one experiment, for example, he supposed that a person would move to an open square if just one current neighbor were from a different race. Predictably, light and dark coins segregated quickly.

A second experiment was subtler and began with the assumption of greater racial harmony, albeit with one qualification: Schelling supposed that a person would not want to be part of an *extreme* racial minority. In this simulation, coins would stay where they were unless they found themselves alone among unlike coins. In short order, sharp divides among neighborhoods began to appear. The effect was so pronounced and persistent that Schelling concluded that even if all traces of racism

could somehow be obliterated the races would still separate like oil and water. Social outcomes need not reflect the intentions, desires, attitudes, or habits of anyone in particular. Something subtler seems to be at work.

It is this sort of example—which has since been elaborated and confirmed through considerably more sophisticated simulations—that prompts us to pause around the questions of the alignment of complexity theory and critical theory. To be clear, we subscribe to both and have argued throughout our careers that each has something valuable to offer contemporary education. However, we feel it might be wise to play devil’s advocate for a moment, to explore the suggestion that perhaps critical and complexity discourses should not (and perhaps cannot) be too closely aligned. As we develop, our point is not that there are no complementarities. Clearly there are. Rather, following Schelling’s and others’ examples, we wonder if the respective emphases of complexity and critical theories might be farther apart than is typically imagined—and, perhaps more importantly, that those differences might be brought into productive tension.

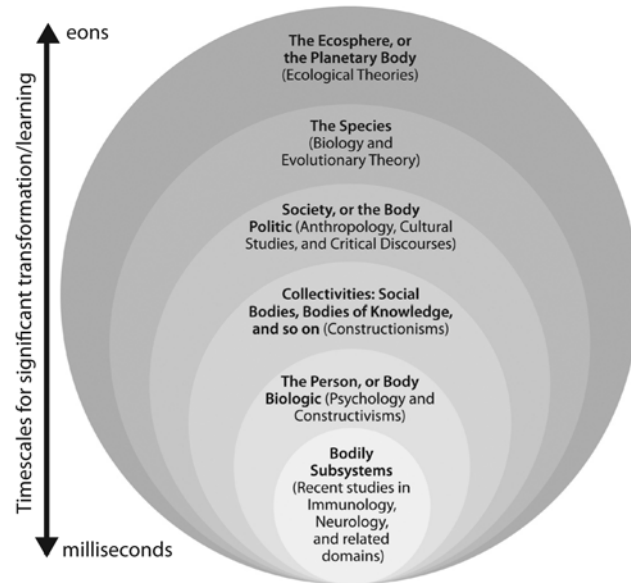
### What’s in a “theory”?

Given these theses, it behooves us to begin with an acknowledgment that critical theory and complexity thinking are already inextricably intertwined. As a field of study, critical theory is anchored to the works of French postmodernist and post-structuralist thinkers, including Lyotard, Derrida, Deleuze, and Morin—who, as Doll (1993) develops, are also noted for their early and enthusiastic embrace of complexity thought within the humanities. However, as signaled by research such as Schelling’s and a few other examples noted below, there do seem to be some strained relationships in this family of associations. One way to highlight and make sense of these tensions is to be explicit about the assumptive space occupied by the word *theory*.

One might argue, for example, that insofar as the academic category of “theory” can be defined, the phrase “critical theory” seems to make much more sense than the term “complexity theory.” Critical theory arose in particular historical circumstances, can trace its lineage to particular philosophical traditions, is identified with particular cultural circumstances, and can be articulated in terms of particular ends or desires. None of this is to say that the term “critical theory” flags a

unified and uncontested domain. The point is merely that there is a coherence that enables participants and commentators to observe, embrace, reject, or otherwise engage.

Complexity theory does not occupy quite the same space. As has been repeatedly developed, it is more an *intertheory* than a theory—that is, complexity theory arises in the realization that there are some common themes among some very different theories (cf. Davis, Sumara, & Luce-Kapler, 2008). Indeed, in the many accounts of the emergence of complexity theory, it is repeatedly asserted that the movement might be construed as a sort of clearinghouse for studies of a stunning diversity of phenomena and the frames and methods developed to understand those phenomena (cf. Waldrop, 1992). This point is embodied in some of the most persistent and prominent assertions of complexity researchers, including that complex phenomena must be studied at the levels of their emergence and care must be taken to situate such studies in appropriate time frames. In other writings, we have attempted to illustrate these points with the diagram presented in Figure 1, intended to gesture toward some of the complex unities of particular to educators, how they enfold in and unfold from one another, and how they are each irreducibly complex (Davis, Sumara & Luce-Kapler, 2008; Davis & Sumara, 2006).



**Figure 1.**

Some nested systems of particular interest to educators and the timescales of their learning/evolution (and prominently represented theories and frames to understand them)

Complexity theory and critical theories, then, seem belong to quite different categories. This point is underscored by the difficulty among those interested in complexity to name what they are up to. Nearly a decade ago, there was a broad movement to re-title the enterprise “complexity science” to announce something that is more encompassing than a theory. Many took up the new name, but not everyone. Others have proposed “complexity thinking,” “complexity attitude,” “complexivist,” or simply “complexity.” None of these is entirely satisfactory. Similarly, one encounters very different definitions of complexity, depending on who is studying what. For example, physicists speak of complexity as the study of nonlinear dynamics, biologists as the study of living systems, and educators as the study of learning systems.

The issue here is specificity. Critical theory is aimed at a particular sort of mindful participation in the unfolding of cultural forms. Complexity thinkers are happy to acknowledge that such undertakings

are commensurate with their own projects. However, the phrase “complexivist critical theory” operates in a completely different manner than, say, “Marxist critical theory” or “feminist critical theory” or “post-colonial critical theory.” Tacking on “complexivist” seems to constitute an evasion. Even while offering advice on how one might proceed, it strips actors and activists of the particularity that reveals commitments, announces causes, and focuses interventions. More worrisome, it might even serve to strip activists of a certain degree of agency—if conclusions such as Schelling’s are to be trusted.

Our point is *not* that complexity and critical discourses cannot work together. It is, rather, that it is not clear to us what is to be gained by placing them on the same plane and bumping them together. Yes, on the one hand, complexity thinking is enriched by embracing critical discourses, in the same way it is enriched by embracing neuroscience and studies of anthills. Carefully articulated and sufficiently focused theories that are concerned with self-organizing, self-maintaining, self-referencing, adaptive phenomena are what make complexity thinking what it is.

But on the other hand, we are not convinced that complexity has much that is new to add to critical discourses. It does provide some advice for effecting change in complex systems, including social unities and cultures, but that advice is not groundbreaking. As we reread Paulo Freire’s (1971) *Pedagogy of the Oppressed*, for instance, we’re struck by the deep compatibility of his engagements and sorts of insights put forward by complexivists on effecting change. Freire wrote of projects that were undertaken nearly 40 years ago. To the best of our reading, although complexity discourses have provided some compelling and useful means to make sense of Freirian proposals, the domain simply has not reached a place where it can offer advice that significantly extends the critical conversation much.

We hasten to add one qualification to that last statement. To our reading, complexity thinking does emphasize one valuable elaboration of the critical theoretic emphasis on social and cultural dynamics. Complexity accounts urge us to consider the biological as well, and they have identified some sites where critical interpretations might have overlooked or underplayed physical constitution and ecological situation. For the most part, where the biological is acknowledged

among critical theories, it is treated as something to be overcome rather than something to be considered. Schelling's sociological work, when coupled to psychology-based research into human predispositions, underscores this point.

To elaborate, there is a curious mathematical consistency among certain human activities. As might be illustrated by the example of clapping at the end of a concert performance, certain phenomena follow a specific pattern. A few people commence, then everyone joins in, it tapers off abruptly and ends with a few late clappers before silence returns. The amazing thing is that this same pattern is manifest around a range of activities that one would imagine to be much more individually determined, including birth rates, fashion trends, cell phone use, and embrace of particular theoretical frames—assuming that appropriate corrections are made for differences in timescales (Buchanan, 2007). To quote American philosopher Eric Hoffer (1955), "When people are free to do as they please, they usually imitate each other.... A society which gives unlimited freedom to the individual, more often than not attains a disconcerting sameness" (aph. 33).

It would be tempting to argue, in the spirit of a critical theorist, that we must work to overcome this sort of tendency. But it is precisely here that a critical attitude runs up against a complexity attitude. The former asserts we must try; the latter points out that such efforts probably will have little effect, in part because so many of these phenomena operate outside of our temporal frames of reference.

### Three sites of contestation: Human nature, Intention, and Responsibility

So are we saying there is little hope for complementarity among critical and complexity theories? Not really. In fact, quite the contrary. However, to find the complements, we believe that we need to offer a deeper analysis.

Consider, for example, the populist construct of *human nature*. Framed by the Judeo-Christian narrative of a fall from the ideal of love and holiness, humans have long been assumed to be, as Machiavelli (1513) put it in *The Prince*, "ungrateful, fickle, dissembling, anxious to flee danger, and covetous of gain" (ch. XVII). And, if anything, 20<sup>th</sup>-century psychological, sociological, and anthropological research amplified the

sentiment, portraying humans as instinctively aggressive, duplicitous, and sex-crazed with a veneer of social responsibility that only works because of its covert service to personal self-interest. It also seems that much of critical theory shares this opinion. The pervasive question, “Whose interests are being served?” betrays a conviction that things happen in the human realm because of greed and grasping. And complexity theory does not help much as it frames much of human activity in terms of unavoidable trend-following.

To be fair, the notion that there is an essential, inherently evil human nature is not endemic in critical theory. On the contrary, it is commonly acknowledged by critical theorists that the construct of “human nature” only makes sense when considered in a context of culture—and so the injustices and trends that we witness are not properly the fault of *persons*, but of *people*. From these points it follows that there is a need to locate one’s efforts at reform across levels of organization from the personal to the cultural, simultaneously.

This transphenomenal and emergentist attitude seems inherently complexivist. But is it? To repeat, a dimension that seems to be religiously avoided by critical theorists is biological constitution. If and when it’s allowed to be mentioned, it is dismissed either as a throwback to hereditary determinism or grudgingly acknowledged in terms of the limits placed by genetics on human possibility. The simple fact is that there seems to be no meaningful dialogue between educational researchers who embrace critical theory and educational researchers who study the physicality of being from a more neurophenomenological angle.

A similar problem arises around formulations of *intention* or *intentionality*, words derived from a root meaning “directed toward some goal or thing.” On the simplest level, intention has to do with deliberate, goal-directed action—typically encountered, for example, in discussions of lesson plans and criminal guilt. For there to be teaching or culpability, it seems, there must be intention.

Critical theory and complexity theory seem to be at odds here, with one giving much airplay to intentional action and the other almost ignoring it. Critical theory seems to be structured around desires to extricate and explicate certain categories of intention and the injustices sponsored by those intentions. But complexity theory, while

acknowledging that selfish intention can give rise to horrible wrongs, is more prone to regard the injustices of the world as inevitable consequences of complex dynamics. Unequal distributions of wealth and power, argue complexivists, are not only inevitabilities; these are phenomena that are given to self-amplification. Consider, for example the way people aggregate into cities. As insulting as it might sound, the emergent patterns of organization do not depend at all on the fact that humans are doing the clustering. The same patterns show up in colonies of bacteria. In fact, they arise when smoke particles deposit on a ceiling. The rich *will* get richer, the advantaged *will* gain more advantage—not because of intention, but because of the laws of nonlinear dynamics.

Such statements are met with knowing nods by complexivists and with indignation by critical theorists. It is at this point that the critical theorist will comment in a biting tone, “Surely you’re losing what’s important by seeing everything as a system!” ... and the complexivist shrugs in response. One frame seeks to interrupt injustice by looking at intention; the other argues that most of what is perceived as intentional is actually accidental. What to do?

This query takes us to our third site of contention: *responsibility*, which would seem to be the site of deepest compatibility between critical theory and complexity thinking. Critical awarenesses of injustices provide the impetus to act, insights into the complex dynamics of social and cultural forms provide some know-how.

Or such would be the hope. In fact, for complexivists, understanding is not the same as predicting or affecting. Complexity tells us what we might try, but it certainly offers no promises for what will happen next. In this sense, complexity thinking is the latest articulation of aphorism that “Life is understood backwards, but must be lived forwards” (often attributed to Soren Kierkegaard, but also to Dame Veronica Wedgwood, among others). Complexity can be applied confidently to make sense of what has happened. But the precious little advice it offers for those seeking to affect the future is always qualified with a “cross your fingers and hope for the best.”

The critical pedagogue in us cannot help but hear this as a sort of capitulation. That said, however, it may be what we’re left with when we look for a critical complexity theory or a complex critical theory. Critical attitudes make us responsible to act, and complexified attitudes relieve



us of responsibility for the consequences of those actions. And this takes us back to where we began. While there is a conceptual compatibility between critical theory and complexity thinking, we cannot yet see the pragmatic value of an explicit marriage. Whereas Marxism, feminism, post-structuralism, post-colonialism, and other theories have helped various critical theorists articulate focus and purpose, complexity discourses seem to us to do the opposite.

### Some common ground: Complicity

We would be remiss if we were to end the discussion here. As noted at the outset of this writing, we seem to have no difficulties aligning our work with *both* critical theory and complexity theory. For us, however, it is not the case that complexity theory must take on a critical edge or that critical theory must expand its scope to become more complexivist. It is, rather, that they both foreground an important notion: complicity.

To contextualize this point, the word *complicity* shares etymological roots with *complexity* (from the Latin *com-* together + *plectere* to braid). The term thus prompts our attentions, as educators and researchers, to the way we are immediate and significant participants in a range of emergent phenomena, including the identities of our students and the character of formal education.

We were first alerted to the deep intertwinings of *complicity* and *complexity* by Cohen and Stewart (1994), who cross the terms *simplicity* and *complexity* to generate *simplicity* and *complicity*. They use this new pair of words to point to what is, and is not, of interest to complexity theory. For Cohen and Stewart, simplicity refers “to the process whereby a system of rules can engender simple features. Simplicity is the emergence of large-scale simplicities as direct consequences of rules” (p. 411). Among the illustrative examples they offer are Newton’s laws and formal mathematics, whose “properties are the direct and inescapable consequences of the rules” (p. 412).

A core issue among complexivists, they note, is that simplicities have not only been taken as models, they have been mistaken as the way things really are. In an effort to interrupt this deeply entrenched habit, Cohen and Stewart propose the notion of complicities as a category of phenomena in which “totally different rules converge to produce similar

features, and so exhibit the same large-scale structural patterns” (p. 414). The educational import of Cohen and Stewart’s simplicity/complicity distinction arises in their summary: “Simplicity merely explores a fixed space of the possible. ... Complicity enlarges it.” And it is here that we find ourselves complexly critical and critically complex.

To our reading, Freire (1971) was making a very similar point in his development of the notion of *conscientização*, a Portuguese word that might be translated as “consciousness raising.” It is an approach to education that is concerned with noticing and uncovering oppressive political and cultural structures, coupled to an imperative to take action against such structures. Significantly, a major emphasis in the raising of consciousnesses is helping people to understand how they are often complicit in their own oppressions—for example, internalizing myths of ethnic or cultural difference.

Freire presented *conscientização* as a practical pedagogical emphasis. First developed when he was teaching poor and disenfranchised members of Brazilian society, the process is oriented toward individual and collective action that is intended to affect the conditions of existence. The main pedagogical strategy is to turn language onto itself—to invite learners into critical examinations of the conventions that frame their experience and into similarly critical examinations of their own complicity in those conventions. As a pedagogical process, it typically begins with identification of one or more identifications (e.g., national identity, cultural norms, religion, gender expectations, social class) that serve as sites for critical study. A preliminary aim of the pedagogy is to participate with learners in recognizing problematic aspects of current identifications. These insights then serve as starting places for articulating alternative beliefs, acting differently, and otherwise altering oppressive aspects of society.

Although developed in the context of work with the underprivileged, Freire’s methods are as relevant to the wealthy as they are to the poor. Topics that might be raised to prompt more critical awarenesses of one’s situation include the distribution of wealth around the world, the reasons their nation might be at war, spending priorities of governments, the influence of mass media on popular preferences, popular conceptions of normality, and the relationships among privilege, cultural exploitation, and environmental degradation. To be clear, the

point is not to arrive at a higher truth or a more correct formulation. It is, rather, to maintain an attitude of mindfulness, oriented by the realization that every act of identification is also an act of ignorance—of carving out a focus of attention by discarding a multitude of interpretive possibilities. The goal is not ultimate truth, but better conditions of existence.

For us, this critical attitude is readily fitted to the complexity realization that the closer one looks at the boundary of a complex/open system, the more troublesome the issues of boundaries and borders become. For example, at the cellular level, it is usually not clear which molecules belong to the system and which to the setting when one zooms in on a cell membrane. The same is true when attempting to distinguish between *person* and *not-person* at the level of the skin, or when attempting to unravel origins and authorship of a particular insight. One cannot specify simply—or, perhaps more appropriately, simply cannot specify—the locations of such boundaries in objective terms. Thus, for the purposes of studying a complex form, the physical or conceptual boundaries of a complex/open system are always contingent on the criteria used to define or distinguish the system from its backdrop. That is, the observer is always and already complicit in the phenomenon observed.

The critical point here is complexity thinking compels us to consider how we are implicated in the phenomena that we encounter—and, more broadly, to acknowledge that our descriptions of the world exist in complex (i.e., nested, co-implicated, ambiguously bounded, dynamic, etc.) relationship with the world. Simply by orienting attentions, a knower's knowledge necessarily affects the ways a phenomenon is perceived and how the knower acts in relation to that that phenomenon. And so, rather than striving for an impossible objectivity, embracing a self-referencing subjectivity, or holding to a culture-bounded intersubjectivity, for the complexivist truth is more about *complicity*. It is not just about the object, not just about the subject, and not just about social agreement. It is about holding all of these in dynamic, co-specifying, conversational relationships while locating them in a grander, more-than-human context. It is about emergent possibility as a learner/knower (e.g., individual, social collective, or other complex unity) engages with some aspect of its world in an always-evolving,

ever-elaborative structural dance.

In brief, then, it would seem that a common theme among complexity theorists and critical theorists is that simplicities are often (mis)taken as descriptions of “the way things truly are.” Hence Cohen and Stewart’s development of the notion of *complicities* as a category of phenomena in which highly similar large-scale patterns are generated by totally different phenomena. For us, *complicity* foregrounds the fact that the observer is always already entangled in the phenomenon observed. We are aspects of grander systems, shaped by and contributing to the shapes of the phenomena in ways and to extents that we simply cannot know. Such realizations render the work of education a profoundly ethical undertaking. Complexity thinking helps us actually take on the work of trying to understand things while we are part of the things we are trying to understand. It highlights that we can never develop an objective appreciation of something of which we are part. Complexity suggests that rather than standing back from the world, we must get involved (and acknowledge our implication/complicity) in the unfoldings of the cosmos.

Interpreted through the lens of *complicity*, then, complexity theory is inherently critical and critical theory is inherently complex.

### Concluding Remarks

That last statement takes us back to the core of our argument—which we will reword here as a concluding assertion. In brief, we believe that, as educators and educational researchers, we must embrace the insights of both critical and complexity theories. However, and in the spirit of complexity theory, we wonder if these two frames might contribute to a more diverse, more robust community if they are permitted to operate in relative autonomy.

We are prompted toward this assertion by the pioneering work of Jane Jacobs (1961), who was among the first to recognize the value of complexity principles for matters of social and cultural wellbeing. Highly critical of “rationalist” urban planning practices that championed the assimilation of people but the segregation of uses (e.g., residential, industrial, commercial), Jacobs argued for the importance of diversity—of worldviews, conducts, uses, and so on. As she developed, it is in the deliberate juxtaposition of diverse possibilities that complex new

possibilities arise. In contrast, the flattening act of assimilation and the fragmenting act of segregation can trigger the decline and death of generative possibilities.

Following Jacobs, we wonder if the same sort of thinking can be applied to the case of complexity and critical theories. Perhaps we should avoid the temptation to integrate, conflate, or otherwise combine these frames into a unified attitude, just as we must take care not to dissociate them into two incompatible categories of understanding. We suspect that more might be gained by attending to their divergences while bringing them into conversation around issues in education. There is at least as much to be learned in the sites of divergence and in the places of agreement.

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