From Nodes to Nets: Our Emerging Culture of Complex Interactive Networks

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As the networks that make me what I am expand, both they and I become more complex and less secure. Speed of connection continues to accelerate until everything and everybody seem poised at the edge of chaos. This tipping point marks the moment of greatest danger and greatest opportunity. When change occurs, it is never as planned and thus is always surprising. The more I struggle to fathom this critical moment, the more complex it becomes. Eventually, I am driven to conclude that I am—the I is—a moment of complexity.

—Mark C. Taylor

It all started with a chance meeting outside an office door. During our impromptu conversation (nervously loquacious at the edge of an abyss?), Mark C. Taylor’s The Moment of Complexity: Emerging Network Culture came up. We shared an interest in networks, information, and complexity, so we were both impressed by the book and its implications for rhetoric, even if Taylor never uses the terministic screen with which we are most familiar. This moment of complexity was new, an opportunity for looking askance at rhetoric and writing. A week or two later, after a lunch or two at Einstein’s Bagels, we had drafted a proposal and a call for papers for this issue of JAC. The tipping point was reached—the moment of greatest danger and opportunity.

It is not prophesying after the event to note that the unplanned connections—the random encounter, the linkage to rhetoric, the “call”—emerged in strange accord with the very principles of complexity and network detailed in Taylor’s book. The guiding presupposition of this issue of JAC is that the essays here show that they are more than afterthoughts. They map new networks across disparate but not entirely
unconnected fields of study. They are opportunistic (moment-ous) and emergent, and somewhat unpredictable. These exciting fields of study promise to challenge and transform great swaths of our received knowledge concerning rhetoric, culture, social organization, and composition.

Complexity theory had been on the thought horizon for over a decade prior to Taylor’s book, with systems and information theory going back even further than that. However, such work was primarily limited to specialized scientific fields like biology and cybernetics, intellectual centers like the Santa Fe Institute, or lay audiences with new wave science interests. This is not to say that the work on complexity is so young, but to say that this work has only relatively recently become of interest to other academic disciplines and general audiences. A few early works appealing to general audiences broached the idea of complex adaptive systems, such as Gregory Bateson’s *Steps to an Ecology of Mind* (1972) and Douglas R. Hofstadter’s *Gödel, Escher, Bach: An Eternal Golden Braid* (1980). However, it may be that James Gleick’s 1987 *Chaos: Making a New Science* stands as the key populist account of chaos theory. Gleick’s book was ubiquitous, if little read, in the early 1990s. The central insight of chaos theory is that simple systems can “exhibit elaborately complex, indeed unpredictable, behavior” (Kellert ix). As Taylor explains, complexity theory grew out of this earlier work on chaos and catastrophe. Whereas chaos theory focused on the diversity that sprang from simple interactions, complexity theory set out to understand how systemic interactions produce new forms of “global” emergent order characterized by different properties than the previous order (Lewin 12).

The early 1990s saw the publication of several popularized accounts of the new science of complexity. Steven Johnson’s *Emergence: The Connected Lives of Ants, Brains, Cities, and Software* arrived only a few months after *The Moment of Complexity*. Johnson focuses on the development of complexity theory from the work of entomologists, urban planners, and software engineers and thus only indirectly considers its relevance for the humanities. Until recently, there has been muted reaction from the various humanities disciplines to the dangers and opportunities of complexity theory—to this tipping point. In retrospect, Richard Lanham’s 1993 book *The Electronic Word* can now be seen as remarkably prescient in attempting to connect rhetoric and electronic literacy to complexity theory, and it is curious that others have taken so long to follow his lead.

Complexity theory is not just an attempt to understand what is complex, nor is it a rationalization for making “theory” more complicated
than it may already be. A computer lab is complex. It is composed of a number of disparate elements networked together in various ways, and the computers themselves are composed of smaller intricate elements, each having some relation to the whole but also performing small miracles of its own. This notion of the complex might be better conceived as complicated. Sure, all the pieces are horribly elaborate, but ultimately everything in the lab can be broken down into its constituent parts, analyzed, and explained. There are clear, if complicated, relations among all the parts in the system. Complicated systems may be broken down into constituent parts, thus allowing for explanation and analysis (see Cilliers). Complicated systems are matrices of predictable material relations. A complex system, however, is one in which the level of order or behavior is not equal to the sum of individual elements or actions. A flock of birds, for example, is a complex system: the individual actions of a particular bird are not sufficient to explain the overall behavioral characteristics of the flock. In this sense, we would say that the flock is an emergent order that is discontinuous from the movements of the individual birds. The individual motions of the birds do not occur in isolation; rather, what each bird does—flying close to its neighbors, not bumping into its neighbors, flying higher or lower or for fun, and so on—is shaped by its interactions with the other birds. That is, each bird’s actions is in some sense adaptive, and the flock of birds can thus also be described as a complex adaptive system. Such a system changes in time, and these changes occur because of the interaction of the individual elements in the system. Such interactions are often described as unpredictable feedback loops or as Taylor names them, following Hofstadter’s lead, “strange loops.”

The Moment of Complexity marks the first time complexity theory has been explored in a sustained manner for its relevance to humanistic inquiry. However, Taylor does much more than explain scientific advances or connect them to contemporary philosophical and cultural theory. He puts complexity theory to work not only analytically but productively. First, he uses it to challenge the postmodern theoretical framework that stems from such figures as Jean Baudrillard, Michel Foucault, and Jacques Derrida, suggesting concrete ways that thought can move beyond them. In a move as self-reflexive as it is ironic, Taylor finds that the critical machinery of these theorists relies on an unquestioned and pervasive confidence that they have exposed a master plot, all the while complicit in perpetuating false, or worse, destructive and paralyzing oppositions. Second, building on the work of those who study networks, Taylor proposes that the contemporary world can best be understood as
a network culture subject to the transformative forces of complexity, forces which allow for randomness and order to coexist in systems continually adapting to new contexts. Finally, he proposes an innovative rearrangement and reconceptualization of education in and beyond the university, one that he has followed through on by forming the Global Education Network (GEN), a company that enacts principles elaborated in the book.

The wager of this special issue of *JAC* is that Taylor puts in play a number of issues crucial for contemporary rhetorical theory and advanced composition. Cultural theory has long been indebted to poststructuralist French theory, postmodern discourse and aesthetics, and the Frankfurt and Birmingham School versions of Cultural Studies, but it is Taylor’s central contention that such work, while incredibly productive, has reached a point of diminishing returns, if not outright exhaustion. Thus, Taylor’s claims concerning our emergent network culture and its complex, adaptive logics challenge current postmodern and cultural theories while opening new fault-lines in the established narratives of the humanities in general. Edith Wyschogrod takes up this aspect of Taylor’s work by providing an overview of what Taylor and other theorists say about the relations between complexity and postmodernism (Nicholas Rescher, Paul Cilliers, Jean-Pierre Dupuy, Eric Alliez, and others). Wyschogrod considers the implications that follow entelechially from Taylor’s channeling of the prospects of network culture, especially as regards the unsure status of the individual, who becomes more complexly and uncertainly situated within a networked, dynamically adaptive and evolving whole. Samantha Blackmon takes up the issue of the individual’s unsure status by examining the role of race in the emergence of new technologies, noting that issues of historical access have profoundly affected the ways technology has been perceived by African Americans and other racial minorities. She points out ways that theories of complexity can aid us in addressing and rectifying technological inequalities and injustices.

By bringing the logics of complexity and the network to bear on human subjectivity, interaction, and communication, Taylor offers much that would challenge established theories concerning rhetoric, writing, and pedagogy. For example, M. Todd Harper discusses the implications of Taylor’s work for rhetorical invention, demonstrating that the endlessly recursive, self-reflexive “strange loops” common to complexity theory allow us to refigure what happens when invention takes place. Nodes become networks that become nodes again, in an infinite and
fractal series tracing the continual generation and play of new knowledge. Jennifer L. Bay examines the role screens play in our interactions with information; we have yet to see an understanding emerge of how the proliferation of screens affects the rhetorical identities of embodied humans. Looking carefully at skin, body, and bodily assemblages, Bay suggests that the future will generate biological and technological connectivity that will in turn transform our sense of material and affective embodiment. From another perspective, Byron Hawk generates polarities between key terms in Taylor and classical rhetoric: *kairos* and emergence; logos and network; pathos and affect; process and evolution; and so on. Hawk concludes that just as these terms stretch and redefine each other, so too should we attend to how rhetoric and composition must stretch and redefine itself within networked culture, a culture that is both digitized and digitizable, or capable of shape- and phase-shifting over time.

The dynamics of complex adaptive systems are inscribed in the emerging study of networks. Indeed, it is the study of the Internet itself that has sparked tremendous gains in our understanding of how electric and social networks function. We have long understood the community in communication, but now we are beginning to see that social organization and communication follow certain logics. As Albert-László Barabási notes in the opening pages of his book *Linked*, these logics are as operative today in the example of a computer hacker attacking a website (fifteen year old MafiaBoy's successful 2000 attack on Yahoo.com) as they were in the early days of Christianity, when Paul achieved destiny by becoming the greatest propagator of Christianity to the masses. Clearly, the operative principles of networks have profound implications for rhetoric. It is one thing to acknowledge that communication works through social, informational, material, and even electronic infrastructures, quite another to stipulate that these network architectures have properties and laws that in turn shape how communication emerges and govern how it becomes transmitted, disseminated, and received. These properties and laws are explored in John Johnston’s essay. Beginning with the example of the Kevin Bacon Game, in which it can be shown that no actor is more than four degrees of separation from Kevin Bacon (the challenge being to name all the links), Johnston describes how networks create connections, and how those connections in turn shape social and information relations—demonstrating, in fact, that the dynamics of network systems are akin to quasi-biologic organisms. Thomas Rickert also considers the emerging science of networks in order to contrast them
with the functioning of ambient environments. While networks are link-driven, ambience connotes something more osmotic, a suggestion that has implications for the rhetorical concept of kairos and our understanding of what it means to compose in any environment.

In part because of his emphasis on new objects of study that come predominately from science, Taylor’s claim that the critical cultural theory of the past thirty years has become predictable and routinized is provocative in the best sense: it challenges us to address the issue of critical theory's legacy and consequences from new perspectives. Taylor urges us to confront the fact that even as postmodern theory has as one of its ultimate goals the recovery and preservation of difference, theoretically and practically this goal has not been achieved; instead, critical theory now produces sameness, not difference, and new hegemonies have been generated that are not in principle much different from the old ones they were combating and sought to replace. From this perspective, complexity theory and the study of networks offer fresh starting points brimming with new insights. John Muckelbauer and Tim Donovan consider the implications of this argument, especially the idea that in moving beyond these exhausted postmodern landmarks, we will get to something new. Perhaps, they suggest, there are ways of figuring the present—this moment—without integrating its singular particularity within a movement of transformation toward greater complexity, a movement that thereby casts the present as in some way already belated.

In The Moment of Complexity, Taylor primes his argument concerning the exhaustion of contemporary cultural theory with an opening chapter on architecture. The failure of modernist architecture, as also modernist culture, was its fetishization of order, especially by means of the grid characteristic of Bauhaus and the New International. Taylor suggests that architecture and culture are now more attuned to the network. Elizabeth Birmingham takes up the question of architecture in Taylor, not so much to critique as to add further, complexifying wrinkles into the smooth, teleological story of grid to network. Birmingham notes not only the absence of female architects, but initiates a shift in focus away from the architect as singular creator to someone who is but an element in a complex and situated network of relations. Birmingham thereby contributes to Taylor’s ultimate goal, the proposal of a general complexity theory hinging on the concept of the network. From this perspective, subject and objects, people and world, are caught in networks of relations that are themselves structured by intricate, coevolving interrelations (Birmingham’s example being that of an architectural firm.
employed by a client). The subject can no longer be thought of as a "self" in the modernist, humanist sense, but rather becomes a node, influencing and influenced by other nodes and forces active in the network. The brain itself becomes a global network, tied in countless ways to informational, affective, and personal relations. Although Taylor does not make this claim explicitly, such an understanding of the world is inherently rhetorical. Communication, persuasion, subjectivity, and interpersonal and intercultural relations have long been key loci of discussion for rhetorical and cultural theory. Taylor's arguments radically reconfigure these theoretical commonplaces. Christine Tulley makes this clear in her discussion of an online rhetoric course she taught. The networked, electronic classroom reconfigures relations between student and teacher and challenges earlier conceptions of dialogue, argument, and rhetoric, while simultaneously building on all that went before. In other words, the electronic classroom itself enacts pedagogical moments rife with complex adaptive interactions.

Taylor's work also points to the interanimating arguments of humanists and scientists, which all too often reach an impasse at culture/nature reductionism. Humanists typically reduce nature to culture; scientists typically reduce culture to nature. The 1996 Sokal Affair—in which physicist Alan Sokal managed to publish a disguised parody of postmodern science studies in a prominent humanities journal, for which he later excoriated them—exemplifies this conflict. Such events are critical impasses, Taylor believes, because they forestall continued cooperation and competition, and thereby hypostatize the divide. (We wonder, though, whether a counterstatement might have been or still is needed, perhaps some disguised parody of philosophical quantum mechanics in *Chaos: An Interdisciplinary Journal of Nonlinear Science*.) Yet, science has of late seemed problematic to the humanities because of a debilitating reductionism and positivism. Nevertheless, reduction is unavoidable due to the nature of our symbol systems, as Kenneth Burke has repeatedly reminded us. And yet, as Barabási states, "Riding reductionism, we run into the hard wall of complexity" (6). The new challenge is to develop understanding with the sufficient scope necessary for explaining the critical problems of the humanities and sciences while suggesting new alliances, amalgamations, and directions. A theory of complex adaptive systems suggests that nature and culture—complex and adaptive themselves—develop interactively as coevolutionary networks, not as structural oppositions. In the end, it is a philosophy of both/and rather than either/or, also calling for reflective analyses through humanistic, scien-
tific, and rhetorical screens. David Tietge takes up this challenge, merging rhetoric and scientific discourse in his discussion of the relation of evolutionary theory to Taylor’s work on complexity. Complexity theory gives us tools more adequate to understand and describe life and world, but these tools must include rhetoric. As Tietge notes, evolution was hard to see for the simple reason that the ordered scientific systems of the past actively obstructed or filtered the kind of seeing that was necessary for evolution to show up. Our rhetorics must then also take on the complex.

Perhaps the most contentious of Taylor’s positions is his argument on behalf of educational praxis—the fusion of theory and practice at the moment of complex educational systems, which are now precariously teetering between traditional educational and business cultures. New forms of cultural production are possible with the rapid growth of the Internet and related technologies, but educational culture has been slow to recognize or appreciate this potential. For Taylor, “[T]he effective use of information and telematic technologies does not involve doing the same thing differently but doing something different” (257–58). As the traditional means of disseminating knowledge, texts “do not have to be closed but can become open and interactive” (258). Taylor’s point is that new educational technologies (such as distance learning) can potentially force new associations among educational, technological, and market forces that academics have been slow to recognize even as the future of higher education hangs in the balance. He contends that mapping this new hypertextual curriculum using complexity theory and network logic can enable new “structures of cooperation and support that would enable educators and educational institutions to assume a significant role in creating an educational environment unlike any we have known in the past” (260). Taylor’s advocacy of the for-profit Global Education Network (GEN) is controversial in part because it enacts theoretical principles at odds with current postmodern and cultural theory, both of which, he contends, rely on an outdated, Kantian model of higher education and only preserve traditional structures under the guise of resistance. Thomas Discenna takes up this debate, noting that various forms of structure, which he defends under the sign of the grid, actually preserve rather than forestall dynamics and complexity; this is especially true of the university, argues Discenna, and he is leery of the embrace of market forces as the only way to aid the contemporary university. Michael Arner also takes this view, suggesting that while Taylor is eminently correct to propound a view of complex adaptive systems as fundamental and
challenging of much of what is currently believed, there is much yet to be learned from Kant and contemporary business gone bad that suggests real limitations to its applicability to the university. For Discenna and Arner, then, there is still much value to be had in preserving established university traditions and structures.

Our interview with Taylor is wide-ranging, but one issue of central concern for readers of JAC keeps insinuating itself into the discussion: the place of writing and the writer at the moment of complexity. There is the sense that the possibility of writing is itself an absurdity, particularly academic writing, which leaps to predetermined conclusions faster than the eye recasts a visual field in a passing glance. In the wake of poststructuralist thought, we are, Taylor suggests, channelers—decentered subjects whose claim to authorship rests on shaky ground. And yet we write. Or, he says, “It is more accurate to say, ‘In writing, I am written as much as I write.’” Socialized and normalized by the grid-like hierarchies of academic value, our scholarship is not writing, he argues. Writing, rather, is thinking-through, which makes the unpredictable or unlikely emergent at the moment of complexity, an act of deliberate—and deliberative—possibility. Writing is future-minded, but it is not bound to the prophecies of normal scholarly work.

Taylor tells us that “[e]ffective patterns of meaning require a new architecture of complexity, which simultaneously embodies and articulates the logic of networking” (17). With this issue of JAC, we invite those in rhetoric, writing studies, and the theoretical humanities to explore this new architecture, as fraught with danger as it is rife with opportunity—for it, too, is a moment of complexity.

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Works Cited


