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The Importance of Harmony: An Ecological Metaphor for Writing Research

This essay argues for the value of an ecological metaphor in conceptualizing, designing, and enacting research in writing studies. Such a metaphor conceives of activities, actors, situations, and phenomena as interdependent, diverse, and fused through feedback. This ecological orientation invites composition scholars to research rhetorically: to devise and argue for a systematic account of reality in ways that others find persuasive, useful, and widely applicable while remaining sensitive to the incompleteness and the distortions of a single account.

Perhaps the academy needs to think of other metaphors for its activities—or imagine other activities.
—John Law, *After Method: Mess in Social Science Research*

In 1970 Evelyn Fox Keller and Lee Segal presented an account of aggregation in slime molds as self-organizing behavior. Noteworthy about this early articulation of emergent identity was the resistance it evoked. Keller ascribes the cause of the conflict to the dominance of the pacemaker metaphor in biology, the belief that slime mold aggregates via the direction or orchestration of a master cell—the pacemaker cell (*Reflections* 150–57). Thus, resistance to both the data and the interpretation of the data resulted from the authority of a particular metaphor concerning the nature of the phenomenon, a metaphor

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powerful enough that it prevented the scientific community from entertaining different notions about the behavior of slime mold. Keller engages in an analysis of this early resistance not to defend the initial theory of self-organization but to illustrate a central tenet of science: the metaphors by which researchers orient themselves to the object of study affect the research methods they choose and the nature of the knowledge they create.

We take Keller as our starting point in this essay to emphasize the importance of metaphor in research. We extend that insight to argue for the importance of metaphoric harmony, which we define as a resonance *among* the metaphors that undergird our conceptualization of the phenomenon of study, our methods of study, and our enactment of those methods. We offer an ecological metaphor as a harmonious way of thinking about, of imagining, writing research on the cusp of the twenty-first century. As sociologist John Law points out, the metaphor by which we organize our research of a phenomenon must align with that phenomenon because "methods, their rules, and even more methods' practices, not only describe but also help to *produce* the reality that they understand" (*After* 5). Without such alignment, the knowledge we create and the applications derived from that knowledge are flawed: limited, reductive, and subject to misleading clarity (2). Thus, if the phenomenon we wish to understand is "complex, diffuse, and messy" (2), then we need to "find ways of knowing the indistinct and the slippery without trying to grasp and hold them tight" (3). Counterintuitive though it may be, complex, diffuse, and messy phenomena require—must harmonize with—complex, diffuse, and messy research methods.

We propose an ecological metaphor as a way of knowing that is congruent with the complexity and messiness of twenty-first-century meaning making. We believe that any research project focused on writing, including not only the intricacies of conventional, print-based literacy but also the challenges presented by new media writing and new "performing literacies" (Fishman, Lunsford, McGregor, and Otuteye), can be harmonious. If framed and performed according to an ecological metaphor in which activities, actors, situations, and phenomena are conceived as interdependent, diverse, and fused through feedback, a research project can be both robust and rigorous.[1] This ecological orientation enables us to research rhetorically: to devise and argue for a systematic account of reality in ways that others find persuasive, useful, and widely applicable while remaining sensitive to the incompleteness and the distortions of a single account. The knowledge produced through researching rhetorically is

"*simultaneously real, like nature, narrated, like discourse, and collective, like society*" (Latour 6).

We open our discussion with the importance of consonance among the metaphors of phenomenon, orientation, and enactment. We then present our harmonious metaphor: ecological research enacted rhetorically. We describe the ways in which conventional and new media writing—the phenomenon of research—has been conceived in ecological terms, leading us to the harmonious metaphor of research as an ecology. We offer three characteristics—interdependence, diversity, and feedback—to help researchers think in ecological ways about the research process and the empirical knowledge it creates, illustrating those characteristics with projects focusing on both conventional and digital literacy. We conclude with researching rhetorically: harmoniously enacting a research project conceived according to ecological principles. At the core of researching rhetorically is a belief in the possibility of both a coherent story of reality and multiple coherent stories. We explore four rhetorical principles crucial to this ecological enactment of research—possibility, *kairos, to prepon*, and rigor—tying these principles to the why, how, and what of twenty-first-century writing research.

Metaphoric Harmony

We choose to focus on *metaphoric harmony* because both metaphors and harmony are intrinsic to research. Metaphors influence our conceptualization of a phenomenon of study and the methods by which we might plan a project to better understand that phenomenon. First, metaphors function as what Kenneth Burke calls terministic screens: terminology that conceals from view certain facets of reality so that it might highlight others (45). Keller concurs, pointing out that "metaphors work to focus our attention in particular ways, conceptually magnifying one set of similarities and differences while dwarfing or blurring others" (*Secrets* 33). Ken Baake argues that metaphors constitute a theory in science by helping scientists hear all the associations of a theory, including associations that ring dissonant. Baake refers to these associations as harmonics. He writes: "Concrete terms generate harmonics that transport meaning across terms. These force the scientists either to modify or reject the original theory so as to accommodate the harmonics" (218).

Second, metaphors provide a theoretical lens or screen that predisposes a researcher to evolve methods and instruments that reveal a reality congruent—harmonious—with that adumbrated by the metaphor. Metaphors of the

research process—the procedures by which scholars observe, gather, and analyze data—are crucially important to a disciplinary community because they delineate what can be studied, who can do the studying, and how that individual (or individuals) should actually perform the study. This is no small point. What researchers know and how researchers know are inextricable. Keller notes that metaphors focus attention, guiding "the construction of instruments that bring certain kinds of objects into view, and eclipsing others" (*Secrets* 33).[2] Thus, metaphors shape phenomena *and* the practices designed to study those phenomena. Keller elaborates: "Different metaphors of mind, nature, and the relations between them, reflect different psychological stances of observer to observed; these, in turn, give rise to different cognitive perspectives—to different aims, questions, and even to different methodological and explanatory preferences" (31).

Because metaphors influence both our conceptualization of a phenomenon of study and the methods by which we might plan a project to better understand that phenomenon, problems occur when particular metaphors guiding phenomenon, methods, and enactment are inharmonious or discordant. Law argues that if researchers wish to understand a world (or an activity in the world) that is complex and messy, "then we're going to have to teach ourselves to think, to practice, to relate, and to know in new ways" (2), in ways that are complex and messy. Effective and robust research requires that the metaphor by which we organize our research of a phenomenon align—harmonize with—that phenomenon.

According to the OED, harmony is the "combination or adaptation of parts, elements, or related things, so as to form a consistent and orderly whole; agreement, accord, congruity." Various aspects of harmony in research have been emphasized in our disciplinary literature. An element common to all approaches to research is the crucial agreement—or accord—between research methods and research questions: one's methods must be harmonious with one's initiating questions. In a kind of melodic call and response, what a researcher asks implicates how that researcher answers. Thus, questions and methods are expected to be consonant. Other approaches, such as feminist and action research, stress the congruity between methodology and goals (Cushman; Kirsch, *Ethical*). The aim of research must agree with the methods that one employs in the research process. Still other orientations to research focus on harmonious discourse, on cordial rather than adversarial language for talking about our own and others' research choices (Barton).

What has received less attention is the importance of harmony among the phenomenon of study, an orientation to research, and an enactment of that orientation in concrete practices. We suggest that the metaphor of research as an ecology offers that three-part metaphoric harmony.[3]

Writing as an Ecology

An ecological metaphor is harmonious and consonant with the phenomenon of study because writing—print-based and new media—is productively conceived in ecological terms.[4] Conventional and digital literacies have been and are both conceptualized ecologically. For instance, in 1986, driven by the idea of literacy as "dynamic, interacting systems," Marilyn M. Cooper described an ecological view of writing "whose fundamental tenet is that writing is an activity through which a person is continually engaged with a variety of socially constituted systems" (1, 6). More recently, in "Writing Takes Place," Sidney I. Dobrin argues that how we operate within and against the systems in which we find ourselves "is both a matter of discursive maneuvering and a matter of physical, material positioning, and consequence" (12). Dobrin advocates a move to *ecocomposition*, opening writing studies to ecological methodologies that enable an exploration "of all the complex interrelationships between the human activity of writing and all of the conditions of the struggle for existence" (13). In a similar spirit, Margaret A. Syverson explicates and illustrates the potential of an ecological framework for understanding the complexities of reader-writer interactions, both print and digital:

> the wealth of reality is richly complex, interdependent, and emergent; we are embedded in and co-evolving with our environments, which include other people as well as social and physical structures and processes. Although composed of many individuals acting independently, the dynamics of processes occurring in these ecosocial environments is irreducible to discrete individuals. (xiv–xv)

Central to Cooper's, Dobrin's, and Syverson's ecological visions is the systemic identity of twenty-first-century writing and its survival as a system. As Amos H. Hawley notes, "human ecology is an attempt to deal holistically with the phenomenon of organization" (7). Thus, the story of conventional and new media writing as an ecology, or ecocomposition, to use Dobrin's term, is less about individual elements—author, invention, error—and more a narrative of interactions intrinsic to a system, what anthropologist and ecologist Gregory Bateson calls the organism-in-its-environment (457). Cooper explains: "An ecologist explores how writers interact to form systems: all the characteristics

of any individual writer or piece of writing both determine and are determined by the characteristics of all the other writers and writings in the systems" (6–7). From this perspective, writing consists of a complex web of ideas, purposes, interpersonal interactions, cultural norms, and textual forms (8–9). Syverson concurs: "We cannot hope to understand [composition] by studying individuals in isolation; we need an ecological approach that considers the dynamics of systems of people situated in and codetermining particular social and material environments" (xv).

Material artifacts and activities integral to the constitution of an ambient environment and the writers and texts within it are all germane to a writing ecosystem. In addition, writing as an ecology privileges circular causality rather than linear cause and effect chains. Here actions of the participants create in part the environment that, in turn, creates the participants. To frame circular causality in the lingua franca of writing studies, language activities and texts shape the environments that impinge on those language activities and texts. At the crux of this dynamic is co-evolution, or what Syverson calls codetermination.

As these and other scholars highlight, an ecological sense of the phenomenon of millennial writing gives rise to a specific array of concerns: the co-evolution of writers, texts, and environments *as* relationships; the conditions necessary for the stability of a writing ecosystem; the "economics" that limit or increase the multiplicity of options within an ecosystem and affect the feedback loops by which an ecosystem shapes itself (see Bateson xvii). Such an orientation enriches the disciplinary understanding of composing in its various permutations.

We not only concur, but we also go one step further. We believe that an ecological metaphor for millennial writing aligns with an ecological metaphor for *researching* writing. An ecological orientation provides a means for studying conventional and new media writing holistically, privileging the organism-in-its-environment. An ecological way of thinking aligns phenomenon and research procedures to create the consonance, the harmony that we consider essential for rigorous and informative writing research. Such a holistic orientation does not restrict a researcher to an either/or choice between qualitative or quantitative approaches. Rather, as research in the science of ecology demonstrates, studying an organism-in-its-environment can be, perhaps even must be, qualitative, statistical, and historical. Crucial to our argument is that an ecological metaphor can beneficially guide the development of any research project, whatever the methodological approach.

Research as an Ecology

An ecological metaphor for research is harmonious and consonant with an ecological metaphor for twenty-first-century writing. An ecological orientation emphasizes the permeability of social and biological worlds as well as the inextricable positioning of the researcher within the whorls of those worlds. Ecology, a term that entered the vocabulary in the mid-1800s, initially referred exclusively to biological relationships: the study of the connections between organisms and their environment.[5] Now a metaphor for systems thinking and a poststructuralist orientation crucial to the study of the intersections of biological and social systems (Bateson; White), ecology is predicated on the belief that biological and social worlds are jointly composed of a network of organisms and environments that are interdependent, diverse, and responsive to feedback. These three central characteristics of an ecological way of thinking—interdependence, integration through feedback, and diversity—provide a harmonious approach to research in conventional and new media writing studies, inviting researchers to orient themselves to paradigms, methodologies, methods, and techniques in new ways.

As we described above, a central quality of ecological writing is its systemic identity, its existence as an outgrowth of relationships. Thus, the first point of congruity—of harmony—between phenomenon and research orientation is the quality of interdependence. Just as ecological writing envisions writing as a web of social, material, and semiotic relationships, so does ecological research envision research as a web of interlocking social, material, and semiotic practices. Rather than conceiving of the components of the research process (paradigm, methodology, methods, techniques, and strategies) as static and isolated from one another, scholars guided by ecological thinking conceive of them as *symbiotic clusters*: knots of nonhierarchical, locally enacted semiotic-material practices that inform each other in multiple ways. From this perspective, then, a paradigm is not an overarching category. Rather, it is a symbiotic cluster, an ecology of reinforcing activities, artifacts, and language.

To illustrate, the symbiotic cluster called positivism is a composite of three interwoven activities: experiment, language, and purpose. In the seventeenth century, the experiment was first conceived as a set of practices meant to compensate for the lack of witnesses in the geographically dispersed and irregularly performed research activities of the Royal Society. It evolved in concert *with* positivism. It did not operate *under* the paradigm of positivism. Instead, it is a defining element of positivism only to the extent that it remains linked

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to that paradigm. Another reinforcing relationship interwoven with experiment and positivism is language. The symbiotic cluster we call positivism and the activity we call experiment both rely on a specific set of language practices that co-evolved in the seventeenth century with experiment and positivism. Citing Steven Shapin and Simon Schaffer's influential *Leviathan and the Air-Pump*, Haraway explains that the evolution of the experiment is inextricable from the evolution of a particular kind of language—a "naked way of writing"—to describe and validate the experiment (*Modest Witness* 26). Thomas Sprat announced this linguistic agenda of the Royal Society, saying that scientific communication needs to return to "primitive purity and shortness, when men delivered so many things in an equal number of words" (xx). Finally, a third reinforcing relationship constituting the symbiotic cluster called positivism is the purpose of the research. Positivism is dependent on a specific purpose, predicated on a specific belief—to determine the laws by which human and physical realities operate—which is integrated with the activity of experiment and mediated by the language of the experiment.

From this description, it is clear that a positivistic paradigm is not—to reprise Keller—the pacemaker cell dictating the aggregation of experiment and language into a research design. Rather, a paradigm emerges out of its linkages, a process that resonates with ecological approaches to twenty-first-century writing.[6] Congruent with the systemic identity of ecological writing, the interdependence of the elements comprising a symbiotic cluster highlights the mutuality (and slipperiness) of paradigm, methodology, methods, and techniques. In addition, the complex and systemic nature of ecological writing highlights the quality of immersion in interdependence. For instance, in writing as an ecology, the writer is always interdependent with a web of semiotic-material practices. He or she is an organism-in-its-environment. Ecological research harmonizes with that quality of immersion, for a researcher is similarly interdependent with a web of social-material practices of research.

An ecological way of researching writing directs the researcher's gaze to relationships, including the researcher's own active involvement in and contribution to a research ecosystem. To write ecologically is to be immersed in a multileveled, multifaceted environment. Likewise, to research ecologically is to be immersed in a multileveled, multifaceted environment. Immersion is thus an important corrective to the flawed belief that a researcher can be separated from the phenomenon of study. An ecological orientation to research fuses the knower, the known, and the context of knowing. Research, researcher, and

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phenomenon are interdependent. An individual can be identified as a researcher—can *be* a researcher—only to the extent that he or she is a participant in and an effect of a particular ecology. Part of that holistic frame is the recognition that the researcher is an active agent not only in the research process but also in creating the conditions—the environment—that serve as the exigency of the research process. As Bateson quips, an ecological orientation is tantamount to a man attempting to understand an escalator at the same time that he is riding it. To study the escalator, the researcher has to be on the escalator, which means that he or she is part of the dynamic that led to the behavior of (as well as interest in) the escalator in the first place. Thus, the interdependence of an ecological orientation includes active participation in the multiple linkages of the research web. Interdependence hauls back into the research process—or acknowledges what has always been there—the disorder and complexity of what Thomas Newkirk calls the wet, messy, rowdy elements like feelings, intuitions, and bodies: heart, mind, and guts.

Interdependence is the first point of congruity between ecological writing and ecological research. The second point of congruity is feedback. A central quality of ecological writing is its existence as a living web of stable, not static, relationships. The transaction among these social, material, and semiotic levels constitutes the act of writing (and the identity of the writer). Writing and writer are created through the feedback—the communication—among the various loops/levels of a system. Such is the dynamic of an ecological system. An ecological orientation to research harmonizes with this quality. The symbiotic cluster that includes the researcher as well as the elements of the research process comes into existence because of the integrative role of feedback.

Feedback, the flow of information between organisms and between organisms and their environment, welds together the elements comprising a symbiotic cluster. To reprise our example above, experiment feeds into positivism, language feeds into experiment, and positivism feeds into language. The quality of feedback provides the researcher with the guidelines necessary to demarcate the scope, or the limits, of a research project within which the researcher is immersed. Feedback implicates two moves in ecological research. It suggests that scholars draw a circle around the pertinent feedback pathways to delineate the span of the research ecosystem and that the circle is always mutable and permeable.

First, ecologically sound research begins by the scholar drawing a mutable circle around all the pathways of feedback that constitute what he or she

wishes to understand. Bateson explains that if a researcher is interested in studying how a blind person walks, then the scope of the study must include the pathways forming the ecosystem of blind-person-walking-on-the-street-with-cane: communication among the man, the street, and the cane. The circumference of the research circle is drawn to include all the feedback pathways of the organism-in-its-environment. Actor-network theorists say to "follow the actors" (Callon, Law, and Rip). Deleuze and Guattari advocate tracking the disruptions; Clay Spinuzzi urges researchers to "trace the genres." In all three cases, the point is the same: the scope of the study is determined by encircling the feedback pathways constituting the phenomenon.

A range of studies illustrates the expandable-retractable circumference of the researcher's point of immersion within feedback pathways. For instance, the circle can be drawn around a specific body, which is exactly what Andrea Freud Loewenstein does in "My Learning Disability," an exploration of the impact of her learning disability on her literacy and her identity. Her "digressive essay" evolves out of linkages within her own body and the challenges her neurophysiological makeup poses for her as a literate individual in a world that privileges mastery of print language. Josephine Peyton Young draws her circle around her home or, more specifically, around her children and their two best friends in a homeschooling situation. Configuring the study in this way allows her, as she explains, "to combine my interests in critical literacy, my concerns for my sons' experiences with literacy, and homeschooling" in her home and her neighbor's home (315).

Immersion can also encircle a larger array of feedback pathways, as Todd DeStigter's award-winning work in the *Tesoros* Literacy Project illuminates ("*Tesoros*"). The *Tesoros* Literacy Project grows out of an effort on the part of DeStigter and two high school teachers to integrate a group of Latino students more fully into their high school community, combating their sense of alienation from that scene. The study is motivated by DeStigter's participation in the site of the classroom, for, as DeStigter explains, he is part of that high school system. He is nudged to create the literacy project when a mentoring teacher asks him what he plans to do about the problem that he had experienced. The *Tesoros* project is his response. But the feedback loops delineating an organism-in-its-environment need not end with a body, a home, or a classroom. The line circumscribing a research ecosystem can include the cultural and personal lives of the students outside of the classroom.

Jabari Mahiri urges just such an expansion in the perimeters of research, arguing that the research circle must swell to include the researcher's involve-

ment in the lives of students outside the classroom: "We routinely ask students to study things we value in the adult world, but our success with students also depends on our efforts to understand things students deem important in theirs" (239). Inspired by various pathways of information, researchers immerse themselves in the ecology of the organism-in-its-environment, teasing out the relationships, constraints, sustainability, and behavior (material and linguistic) that constitute that system.

Such an orientation is essential in researching twenty-first-century, as well as traditional, literacies, something that Jenn Fishman and Andrea Lunsford demonstrate in a Braddock Award–winning article co-authored with two Stanford undergraduates. Beginning with Stanford's longitudinal study of undergraduate literacy practices, Fishman and Lunsford discover that they cannot limit their focus to the writing that students do in the classroom, rich though that source pool might be. To explore the full spectrum of student literacy, they have to attend to what they call students' "performing literacies": writing designed to be enacted in venues outside of the classroom. Thus, the circumference of the study necessarily expands to include this new aspect of the phenomenon they wished to study. In addition, Fishman and Lunsford explicitly connect their growing understanding of performing literacies to the rising occurrence of new media writing in and out of the classroom. Performing literacies erupt in digital environments through such conduits as social networking websites like MySpace and Facebook as well as performance websites like YouTube. An ecological orientation enables a shifting circumference; it invites the researcher to define a research project by means of the relationships—the networks—feeding into a particular phenomenon, a process that harmonizes with an ecological metaphor for writing.

Second, even as feedback helps the researcher determine the *scope* of research, it simultaneously highlights the *permeability* of any circle a researcher draws to define the organism-in-its-environment. Project perimeters are not just flexible. Feedback reminds researchers that these lines are also porous. Bodies, families, classrooms, cultural, and physical environments interface. So, while the primary point of the research focus is always on the knot of interrelationships—the symbiotic cluster—within the circle drawn by the researcher (and around the researcher), an ecological orientation emphasizes the degree to which the circumference of that circle can, perhaps even must, remain sensitive to the pathways of information just beyond its perimeter that feed into its ecosystem. Thus, Loewenstein's circle shifts at certain points to encompass

her mother. Young's organism-in-its-environment at crucial junctures expands from the site of the home to encompass a field trip to a historical site that involved a tea party. Fishman and Lunsford's exploration of undergraduate writing also narrows at one point to examine the internal performative metaphor that guides one student's creative process.

The point we wish to emphasize is that the circumference of the circle delineating the research situation is both mutable and permeable, requiring that the researcher remain sensitive to the porosity of the perimeter. The circumference of context can expand or contract as necessity demands. It can be narrowly construed, as in the specific body of the student, or it can be broadly construed, as in the impact of the architecture of a housing project on children's acquisition of language. What is constant is not a *kind* of context but the *act* of circumscribing a boundary and the permeability of that boundary.

The combination of interdependence and feedback in research is congruent with, harmonious with, the systemic identity of conventional and new media writing conceived as an ecology. This harmony directs attention to the integration of research, researcher, and situation. It provides the guidelines necessary to determine the parameters of the specific system within which the researcher immerses himself or herself. These are practical and important considerations. But, equally important, the harmonious combination of interdependence and feedback in research orientation and phenomenon provides insight into the phenomenon of philosophical and procedural change, which directly impinges on the value assigned to what a researcher does—the activities he or she enacts—while immersed in an ecology.

An ecological metaphor provides a mechanism for understanding changes in established symbiotic clusters or the emergence of new symbiotic clusters. Rather than adhering to the belief that research is founded on the flawless paradigm, the ideal question, the pure methodology, the unpolluted method, and the correct technique, the ecological orientation privileges flexibility and thereby accounts for the very real, and very valuable, phenomenon of paradigmatic and methodological change. The dynamic of interdependence and feedback provides a way to understand and appreciate those shifts. Consider, for instance, the evolution of action research. As Anne DiPardo and Melanie Sperling, immediate past editors of *Research in the Teaching of English*, note, "The time is ripe for literacy researchers to function as public intellectuals" (here the authors cite Labaree 1998),[7] "actively guiding the conceptions of literacy practices and learning that inform policy initiatives" (246). Cross-polli-

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nating with action research in education (Stringer) and social action research among feminists (Kirsch, *Ethical*), this new symbiotic cluster struggles to emerge as a legitimate research methodology. Feedback pathways are central to that emergence. From an ecological perspective, a researcher is always part of, immersed in, the organism-in-its-environment. In addition, the research environment can only be parsed provisionally from other environments, including sociopolitical environments. Pathways of feedback join ecosystems, which means that a research site is always permeated with cultural and political currents, and those interdependencies reach tipping point in social action research.

DeStigter illustrates that tipping point ("Public Displays"). He returns a year after the conclusion of the *Tesoros* Literacy Project to visit with his former students only to discover that the gains in the classroom were tragically limited to the classroom. After leaving high school, many of his former students had been unable to maintain the patterns of inclusion and academic success they had formed during the project. Instead, many of them suffered reversals. DeStigter concludes that research must widen the gyre, must enlarge its scope so that it operates in various environments simultaneously, including, especially, the public sphere. The complexities of life outside of the classroom are inextricable from the complexities of life within the classroom. To ensure that positive changes in the classroom migrate beyond the school doors requires attending to the larger social context: action in research impinges on action in society. Our point is that scholars can account for the co-evolution of this symbiotic cluster only through the dynamic of interdependence and feedback. Responsiveness to the impact of one's actions and the messages communicated from and about the ambient environment effect a change in the disciplinary ecology.

The qualities of interdependence and feedback, then, reorient the identity of the researcher, the position of the researcher in relationship to his or her research, and the determination of the scope and intent of the research. Weaving throughout our discussion of interdependence and feedback, especially in our account of change in the research landscape, is the third quality of our ecological metaphor: diversity.

Central to the ecological metaphor of twenty-first-century writing is what we described above as the "economics" of a writing system: the affordances that limit or increase the multiplicity of options within an ecosystem and affect the feedback loops by which an ecosystem shapes itself. These affordances

are directly connected to diversity, and our ecological metaphor of research is harmonious with its reliance on diversity. Diversity is central to maintaining the viability and health of an individual research project and a discipline's research agenda. Biologists have long asserted the importance of biodiversity, a fuzzy concept that ranges from variation in gene pools to variation in ecosystems. Beyond the economic and spiritual values of biodiversity, a multiplicity of life forms is essential for the resilience and productivity of ecosystems, biologists argue, because an ecosystem exists through its interactions. So, if the number of participants in an ecosystem (or the number of ecosystems) is eroded, the interactions are affected, and the intricate network of life destabilizes.

An ecological orientation to research emphasizes the need for *research diversity*: multiple sites of immersion, multiple perspectives, and multiple methodologies within a particular discipline and research project. To flourish, writing studies must generate individual research projects that focus on a wide array of contexts, from the bodies of individual writers to classrooms, workplaces, clubs, churches, neighborhoods, virtual environments, and historical moments. This aspect of diversity impels researchers to seek out different contexts for writing, to read beyond their normal scope of disciplinary literature, and to redraw the circumference of immersion.

A consequence of multiple sites is the need for multiple perspectives among both researchers and research subjects. Traditional approaches to research have crafted a monoculture in which the identities of the researcher and the subject of research are carefully controlled and carefully separated. An ecological orientation destabilizes that monoculture, requiring researchers to consider who is empowered to ask questions and solicit answers, who can be the object of study, who can be authorized to analyze the data, and who can conduct and report research. These questions force an acknowledgment of the situated nature of any research endeavor, resonating to a similar agenda among feminist philosophers, historians, and sociologists of science and reflexive anthropologists who assert that all knowledge is produced by agents acting in specific physical and chronological locations, within specific social, economic, and ideological conditions. *All* knowledge is *always* situated. This realization is a prelude to diversification: a commitment to increasing the range of perspectives, the range of voices, speaking in any one study.

In addition to sites and perspectives, research diversity requires multiple methodologies. As conceptions of literacy expand, DiPardo and Sperling ar-

gue, so too must conceptions of research: "Diverse literacies suggest diverse questions, which in turn necessitate richly varied frameworks, methods, and rhetorical strategies" (246). This methodological diversity operates on two levels: the global and the local. The global level concerns the disciplinary welcome of different approaches. For instance, many scholars have argued that the complexity of the phenomenon of study—twenty-first-century writing—requires an array of methodological examinations; thus, any discipline devoted to understanding millennial writing must welcome a variety of research approaches and orientations rather than retaining a siege mentality that "protects" a favored paradigm or methodology from the incursions of those less privileged. On the local level, diversity involves the reliance on multiple research approaches in a single study. Cindy Johanek refers to this as a contextualist approach, where what one chooses to do as a researcher is an outgrowth of the demands of the immediate situation. Situations are varied; thus, a researcher's responses must be varied as well. We call such multiplicity an ecological approach because that metaphor highlights the degree to which all research approaches are interpellated with the practices of other approaches, an orientation that directly implicates local diversity.

While global diversity, at least in principle, might be making inroads, local diversity continues to be a problematic issue. Scholars argue that relying on multiple methodologies risks pollution: the attempt to fuse competing if not contradictory orientations. Such an effort, the argument goes, is discordant. However, Gesa A. Kirsch contends that "methodological pluralism is possible [is harmonious] if researchers bring a critical self-awareness to their studies and explicate—rather than gloss over—the epistemological issues implied by their research methods" ("Methodological" 248). We go even further, asserting that such diversity—pollution—is inescapable because no research practice is ever pure; it is always subject to the intricate relationships that constitute it. Thus, hybridity is an inevitable result of any research endeavor. We concur with Kirsch that a critical self-awareness is necessary for diversity, a recognition of and response to the crossbred nature of any research project. But we also contend that critical self-awareness arises out of an enactment and exploration of research as an ecology, as a symbiotic cluster of practices, discourse, and artifacts. It arises out of research diversity.

Interdependence, feedback, and diversity, the three core characteristics of an ecological metaphor of research, reconfigure in radical ways attitudes toward research, researcher, and the phenomenon of research. An ecological

metaphor privileges messiness, interaction, and dynamism, exploding the notion of research as a neatly organized process involving discrete categories of procedures, results, identities, and realities. Such a metaphor is necessary, Law claims, for understanding the flux, transience, and complexity in reality. "The world is largely messy," he argues; "contemporary social science methods are hopelessly bad at knowing that mess. Indeed," he continues, "dominant approaches to method work with some success to repress the very possibility of mess. They cannot know mess, except in their aporia, as they try to make the world clean and neat" ("Making" 3). An ecological metaphor for research provides what Law calls a way "of living with and *knowing* confusion" (4). Like writing, research from an ecological perspective does not locate knowledge in any one part of the research process or in any sum of the parts. It is not in the data or in the construal of the data. It is not in the methods of analysis researchers bring to bear on the data. Instead, knowledge in research, as it is in writing, is in the ecology, in the transaction of the organism-in-its-environment.

The harmony between phenomenon and research orientation through interdependence, feedback, and diversity points to changes in how scholar-teachers *think* about research. But these three characteristics also change how scholar-teachers *do* research. An ecological way of thinking requires writing researchers to enact research activities—to determine an important question, valid data, ethical procedures, and so forth—in new and ecologically consonant ways.

The Rhetorical Enactment of an Ecological Metaphor

Metaphoric harmony between phenomenon and research orientation, even a harmony based on aligning complexity and messiness, is crucial to effective and robust knowledge building. Equally crucial is harmony between research orientation and enactment, between thinking and doing. As Law points out, "method goes with work, and ways of working, and ways of being" (*After* 10). A shift to an ecological orientation—a new way of thinking—requires a shift to a new way of working. Here is where we come to the last portion of our exploration: to remain harmonious, an ecological metaphor for phenomenon and research must be performed rhetorically.

At once material and discursive, rhetoric offers practical guidelines for the *doing* of sound ecological research that are harmonious with the *planning* of sound ecological research.[8] Rhetoric has been an invisible presence in our

discussion of ecological writing and ecological research, particularly in the shared suppositions concerning the nature of knowledge. Phenomenon, orientation, and enactment are predicated on the belief that knowledge consists of a contingent, mutable truth that cannot be "proven" by its correspondence to some material reality outside of the research ecosystem, although it is certainly constrained by a material reality to which researchers and writers are accountable. To illustrate, ecological writing and ecological research both assume the systemic nature of millennial writing and research on that writing. They both emerge from the transacting loops of social, material, and semiotic realities, constituted through integrative feedback and responsive to context as an organism in its environment. The knowledge research and millennial writers create is similarly social, material, and semiotic. Rhetoric is an integral part of this process, for ecological knowledge binds materiality *with* rhetoric. Creating knowledge necessitates arguing for stories about the things-in-themselves in ways that others find persuasive, useful, and widely applicable. Researchers relate what they experience—the things-in-themselves—in a mode that is both meaningful and coherent, while recognizing that other (although not infinite) meanings and coherences are possible. This process is not research as direct, unmediated insight into reality as it is; nor is it research as discourse, shorn from all material contexts and material effects. It is research "in a new form that has a simultaneous impact on the nature of things and on the social context, while it is not reducible to the one or the other" (Latour 5).

Rhetoric provides a means for harmoniously transforming this orientation to knowledge and phenomenon into concrete action. According to John Poulakos, *"[r]hetoric is the art which seeks to capture in opportune moments that which is appropriate and attempts to suggest that which is possible"* (26). It is an activity "grounded in human experience, not in philosophical reflection" (25), which means that rhetoric is immersed in the material reality of lived experiences. In addition, rhetoric is not a language of universal truth. Poulakos explains:

> In distinction to *episteme*, rhetoric does not strive for cognitive certitude, the affirmation of logic, or the articulation of universals. Conditioned by people who create it, rhetoric moves beyond the domain of logic and, satisfied with probability, lends itself to the flexibility of the contingent. (26)

Inextricable from context and communities, rhetoric is caught up in, comprised of, the movement between actuality—what is real—and possibility—

what can be; thus, it helps a community envision a future even as it contributes to the creation and maintenance of that community's material present. In ecological language, rhetoric is immersed in feedback loops that link the timeliness of the situation, the constraints of a situation, the push-pull of actuality and possibility, and the vagaries of audience to the research ecosystem.

Driven by the urgency of the moment and the desire to move from that moment into a different reality, rhetoric puts ecological thinking into action by providing answers to the why, what, when, how, and how much of research. More specifically, researchers who aim at enacting an ecological way of thinking are guided by possibility, *kairos, to prepon,* and rigor. To illustrate the robust potential of metaphoric harmony among phenomenon, research orientation, and enactment, we organize our last section according to a series of questions with which all researchers, especially novice researchers, struggle.

Why Should I Conduct Research?

We live in a postmodern era where reality is construed as a linguistic construct, comprised of an intricate layering of texts. A troubling result of such a construct is erosion of one's belief in the value and validity of any research project (Haraway). Haraway points out the dangers of such textualizing:

> We [feminists] unmasked the doctrines of objectivity because they threatened our budding sense of collective historical subjectivity and agency and our 'embodied' accounts of the truth, and we ended up with one more excuse for not learning any post-Newtonian physics and one more reason to drop the old feminist self-help practices of repairing our own cars. They're just texts anyway, so let the boys have them back. (*Simians* 186)

If knowledge is just an array of signs, then who cares about research? The motivation to construct knowledge of the world—to care about that knowledge and that world—is undermined.

In addition, institutional demands tend to transform research into cultural capital. Teacher-scholars conduct research spurred by threat of the tenure clock or degree requirement. In the face of institutional exigencies, the drive to research as a means to effect beneficial change in students' lives or to contribute to the knowledge base of one's discipline is blunted. Combined with the postmodern attitude that research produces nothing except competing stories, institutional expectations dull the desire to conduct research.

An ecological orientation, with its triad of interdependence, feedback, and diversity, provides a persuasive response to this question of why teacher-

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scholars should engage and continue to engage in research throughout the life span of their careers. Rhetorically enacted, an ecological orientation offers teacher-scholars the hope of *making* a difference in the material conditions of one's reality. Poulakos argues that rhetoric is grounded in the tangible, in the human experiences of the here and now, an essential aspect of ecological thinking that merges organisms, material environments, and feedback: "To be sure, man walks on earth and his feet are a constant reminder of his connection to the ground" (30). Poulakos calls this *actuality*, the materiality of the moment, with all its array of constraints and realities.

This rhetorical constraint grounds research in concrete phenomena, in the human experiences of the here and now. In addition, rhetoric is about the possible; it is motivated by the desire not only to describe the current situations but also to change the here and now. Even with his feet on the ground, a human being also "looks at the horizon about him and perceives himself 'not as he is, not where he is, but precisely as he is not and where he is not'" (30). Poulakos explains that the "sphere of actuality always entails a lack, the absence of that which exists only in the future" (30). Thus, a human is pierced by the "desire to be other and to be elsewhere" (30). This rhetorical constraint binds research to a human response to that lack; it enacts a vision of the possible. Like rhetoric, research is performed as "a movement originating in the sphere of actuality and striving to attain a place in that of potentiality" (26). From this perspective, research "refuses to keep people in their actual situation" (30). It "tries to lift them from the vicissitudes of custom and habit and take them into a new place where new discoveries and new conquests can be made" (31).

The siren song of making a difference, of moving from actuality to possibility, is what motivates scholars to enact an ecological orientation through researching rhetorically. Neither entirely material nor entirely semiotic, ecologically oriented research is always poised on the edge of difference. Here the researcher and his or her project are situated on the cusp between materiality and semiosis, tangible reality (organisms and environment) and communication, actuality and possibility. Thus, rhetorically enacted, research is something that is undertaken for reasons that go beyond the motives of satisfying one's degree requirements or providing material for promotion and tenure considerations. To paraphrase Bateson, research is undertaken so that new knowledge can be a difference that *makes* a difference (458).

What Questions Should I Ask? When Is a Good Time to Ask Them?

Motivated by something beyond—in addition to—degree requirements and a promotion/tenure committee, a researcher has to struggle with another quandary: what is an important question, or, to rephrase that in ecological terms, where can I make a difference? The ecological trio of interdependence, feedback, and diversity only compound the difficulty: how does one isolate a single question about a complex system when everything is interrelated *and* when one is immersed in the system? How does one shape an exigent question that honors—that harmonizes with—complexity and positionality? The rhetorical concept of *kairos* provides a way for researchers to work through the holistic, systemic quality of ecological thinking by embedding a teacher-scholar in the urgency of the moment and the place. It helps a teacher-scholar determine a question that is important: where can I make a difference *now*.

As Poulakos explains, rhetorical situations are interdependent with time and place; a rhetor is moved to speak by an almost intuitive sense of timeliness or *kairos,* the conviction that this is the right time to speak in this place (28). This intuitive sense of timeliness arising out of a researcher's immersion in the network of time and place aids him or her in deciding the "what" and "when" of the research situation. Rather than beginning with a research question or artifacts, which are the conventional starting points for research, a rhetorical researcher enacts the systemic nature of ecological thinking through *kairos,* a move that shifts research from a process of problem identification and problem solving to a response to the urgency of a particular situation within which the researcher is immersed. What a researcher focuses on depends on the exigency of the moment. Poulakos explains that when "things are 'under control,' there is no pressing need to speak. But during times of stress, we feel compelled to intervene and, with the power of the word, attempt to end a crisis, redistribute justice, or restore order" (28).

This "pressing need to speak" helps the researcher delineate the scope (the circumference) of his or her study, a difficulty of an ecological orientation, and it arises out of the researcher's immersion in the phenomenon. As part of a symbiotic cluster, a research project is always co-dependent with a multifaceted material context; the researcher is immersed as well in that context. When a reality or phenomenon is "under control," there is no pressing need to research. However, motivated by stress, researchers seek to create knowledge that will "end a crisis, redistribute justice, or restore order." Here is the answer to the "what" question of research. In addition, *kairos* helps answer the "when"

question. Research situations exist in time and so must be timely. As Poulakos explains, "timeliness renders it [an argument] more sensible, more rightful, and ultimately more persuasive" (29). This aspect of *kairos* transforms research from a sequence of steps surrounding the question-answer dynamic to an opportune moment for action, for making a difference.

How Do I Design a Research Project?

Another challenge posed by an ecological orientation to research is the design of a research project. How are interdependence, feedback, and diversity honored—enacted—in a research project? Decorum provides the script for translating these elements into scholarly action.

Designing a research project that responds to the urgency of the moment is guided by the dictates of *to prepon*, or decorum. How scholars research—the procedures they employ as they respond to a kairotic urgency—and how they present that research in print form must be harmonious with the interdependencies of "both audience and occasion" (Poulakos 29) and responsive to the feedback crucial to both. Rhetorical situations have formal characteristics, Poulakos argues, and "speaking as a response to a situation [must] be suitable to those very characteristics" (29). Research situations have formal characteristics as well. Thus, researching rhetorically calls for decorum in research procedures, or sensitivity to (as well as knowledge of) the formal characteristics of a research situation. This manifests itself not in methodological correctness, but in methodological appropriateness and responsibility. For example, by acting decorously, a researcher makes methodological choices, such as decisions about the organization of specific methods and techniques, which align—harmonize—with the exigency of the situation and the expectations of the disciplinary audience. The researcher knots together aims and orientations so that both correspond with research design.

To illustrate the enactment of interdependency and feedback through decorum, consider the use of ethnography, which incorporates the researcher's own positioning to "fit" the formal characteristics of the situation and sensitivity to the dynamic nature of that situation. For example, a feminist paradigm integrates an activist or interventionist agenda, a desire to alter conditions inimical to the status of women in the world. Thus, it is decorous in feminist research to include that activist agenda. Decorum imposes certain conditions on the performance of a methodology. It knots together the elements of a symbiotic cluster, inviting the rhetorical researcher to answer key questions: who

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is responding to the urgency, who is determining the circumference of the study, what is the phenomenon of study, and who is the intended audience? It interweaves the framing of the research with the relationship between the subject and the researcher, and the way in which the researcher identifies herself or himself within the confines of a particular study. Thus, determining whether a study is appropriate requires assessing the linkages and the feedback among methodological responsibility, communal expectations, and situational ethicality.

Beyond helping a researcher make methodological decisions consonant with feedback and interdependence, decorum also leads the researcher to reconfigure data as appropriate. Traditionally, data are conceived as raw: unmediated bits and pieces of a material reality. Data are factual, organized for analysis, and used to make decisions. Data are systematically collected, allowing the bits and pieces to be treated as units and symmetrically compared. However, data become data only because of the feedback among other components of the ecology, and, thus, they are subject to decorum. "Let the data speak for themselves, these scientists demand. The problem is, of course, that data never do speak for themselves," Keller points out (*Secrets* 27). All data require interpretation, interpretation requires a shared language, and a shared language requires a common conceptual universe (27) (see also *Reflections* 130–31). As a result, data do not exist in some pristine state; they co-evolve out of complex relationships, constituting a particular ecology.

To exist, to be considered data, bits and pieces of a material reality must be decorous, must be suitable to the formal characteristics of the situation and address the kairotic urgency of the situation. They must be harmonious with the interactions among members of a community within a particular reality. Individuals interact with material forces and with each other, defining data as a result of those interactions. Information becomes "factual" only through communal or disciplinary validation. Whether a phenomenon gets recognized as "factual information" depends less on its de facto existence than on its significance to a particular community. To use Bateson's terminology, a datum becomes a datum when it constitutes a "difference that makes a difference" (458). What counts as important data and what is recognized as data is a "product of a dialectic which takes place among a speaker, an interpretive community or social group in which the speaker is trying to contribute, and the historical, political, material, ideological, and situational context in which the speaker is working" (Shriver 1). In other words, what constitutes valid data is a question of decorum.

To prepon, consisting of a series of actions—of material-discursive choices—provides scripts through which a researcher enacts the qualities of interdependence and feedback in ecological thinking. *To prepon* also offers procedures for honoring the diversity so essential to ecological thinking and good research. Diversity in an ecological orientation highlights the importance of multiple sites, multiple perspectives, and multiple methodologies for the survival of a rich, healthy research community. *To prepon* enables researchers to perform diversity in two crucial and overlapping ways: by aligning method-ology and phenomenon so that both are consonant with each other and ap-propriate for the rhetorical moment, and by aligning text and phenomenon to achieve a similar consonance.

To prepon leads a researcher to evolve a range of methodologies that reso-nate with the demands of the phenomena. Occasions for research like occa-sions for rhetoric are not singular. Research *situations*, not a research *situation*, exist, a difference far more significant than the simple plural indicates. Thus, the multiple linkages between phenomenon and methodology require a deco-rous researcher to consider a wide range of choices, ensuring that research approach and reality harmonize with, are appropriate for, each other. For ex-ample, arguing for a research methodology they call educational criticism, an amalgamation of art criticism and educational research, David J. Flinders and Elliot W. Eisner contend that such a methodology is necessary because teach-ing is an art and thus can be understood only in terms of other arts, like dance and poetry. The complexity of the phenomenon feeds into the nature of the research process leading to the evolution of an appropriate methodology.

In addition, *to prepon* also invites ecological diversity by helping the re-searcher to consider the fit between text and phenomenon. Poulakos explains that "[a]ppropriateness refers to that quality which makes an expression be correlative to the formal aspects of the situation it addresses" (29). Without a doubt, an important aspect of this correlation is the decorum, the diverse and multiple linkages, between text and audience. Those linkages frame the re-search results within the discourse expectations of the target audience, a pro-cess necessary for the validation of research knowledge. However, *to prepon* also points the researcher to the diverse and multiple linkages—the decorum—necessary between text and phenomenon. The greater the options for framing discourse within an ecosystem—the greater the discursive diversity—the greater the options for linking with a messy, complicated, multifaceted reality. Methods include modes of representing the phenomena, which means that a reality that embraces "the ephemeral, the indefinite and the irregular" (Law,

After 4) requires diverse discourse options so that descriptions of reality—descriptions that in part create that reality—are appropriate for that reality.

The complexity of a phenomenon feeds into both the nature of the research methods used to understand it and the nature of the text used to represent that understanding. Decorum highlights the necessity of possessing diverse means for linking procedures to exigencies to phenomena to communities to desires because these linkages inevitably overlap. Flinders and Eisner argue that the results of educational criticism require new modes of representations that rely on the techniques of the arts: rich imagery, multilayered symbolism, and multimedia formats. The desire among community members for new insights inspires the development of new methodologies that then evoke the development of new discourse forms that finally return to the community, challenging and changing preconceived notions of effective presentation of research results. Thus, decorum both "affirms and simultaneously seeks to alter" audience expectations, as Poulakos points out. What comprises decorum is similarly variable.[9] While the requirement of decorum remains stable throughout the new forms of research and representation, the characteristics that constitute decorum are constantly evolving, constantly diversifying (see Eisner and Gardner; Glesne; Richardson).

Through the dynamic of possibility, *kairos*, and *to prepon*, teacher-scholars can create research projects that are consonant with the interdependence, diversity, and integrative feedback of ecological thinking. The possibility of making a difference while immersed in a complex system provides a sustaining motivation; *kairos* and *to prepon* establish tangible guidelines for determining what, when, and how to research. The final question that researching rhetorically addresses concerns the quality of the new knowledge. Or, in other words, how much of a good thing is necessary for rigorous research from an ecological orientation?

What Criteria Do I Use to Judge the Quality of My Research?

The triad of interdependence, feedback, and diversity intertwines to support a single overarching goal: ecological sustainability, the ability of a system to maintain its health and diversity. Sustainability is also essential to good research and to the health of a discipline. That sustainability can be harmoniously enacted through what we call *rhetorical rigor*. Healthy research and a healthy disciplinary matrix for research involve developing a coherent and densely textured argument as a symbiotic cluster; it involves creating rhetorical rigor.

Enacting an ecological orientation does not mean that a scholar-teacher dismisses or disregards distinctions among and between research elements; it does not mean that it is acceptable to mix and match different research components with abandon. Nor does it mean that because research is inevitably messy, it is inevitably incoherent or bereft of order. Rather, an ecological metaphor positions research within the productive push and pull of what Bateson calls rigor and imagination, the dialectic between strict reasoning and chaotic, creative thought. Like any ecology, sound research is sustained through a careful balancing of constituent life forms—of symbiotic clusters—which means that it is successful only when it is done carefully, thoughtfully, systematically, and through multiple linkages. This is the core to rhetorical rigor, the means by which the success of a research project is assessed.

Rhetorical rigor simply means the degree to which the different practices on which a researcher draws have been interlinked, applied, analyzed, and presented to form an internally consistent, contextually appropriate, and methodological persuasive story. The more numerous the rhetorical-argumentative-narrative links among different research elements/practices, the more tightly knotted is the symbiotic cluster; the more tightly knotted the cluster, the more rhetorical rigor a project possesses (see also Latour, Mauguin, and Teil). Thus, a researcher establishes that a study is timely and appropriate by tracing the many necessary and diverse feedback loops among stated objectives, systematically gathered and analyzed data, reflectively and contextually presented evidence. The researcher creates rhetorical rigor by articulating careful connections between the context of the study and the groundedness of his or her own position, between methodological choices and kairotic urgency, between phenomena and representations.

To determine rhetorical rigor, teacher-scholars asks such questions as the following:

- How dense are the interconnections?

- How strong are the feedback loops and how responsive is the study to feedback?

- How wide are the interstices among interconnections?

- How numerous are the clusters and how distributed is the density of their connections?

- How strong are the interdependencies?

As these questions highlight, research, like rhetoric, is both art and skill, a matter of feeling and intellect, a reciprocity of imagination and systematic thought. Its quality and power are derived from the strength and multiplicity of its feedback loops among community, phenomena, evidence, hypotheses, and fundamental beliefs.

An ecological way of thinking requires more than simply putting together pieces in a predetermined research design. Constrained by material reality, ecological thinking enacted rhetorically balances the demands of paradigm, methodologies, methods, and techniques with the demands of context, audience, purpose, text, and phenomena to find real and possible answers to questions that matter. It is articulating (both in the sense of connecting and in the sense of expressing) a rationale, an argument, and a series of schemes and tropes. Researching rhetorically means that a scholar consciously and carefully makes multiple and varied linkages to produce data from which to make a new argument. Doing ecologically sound writing research means that paradigms, designs, methodologies, methods, and techniques are not only symbiotic clusters. They are also symbiotic clusters of rhetorical practices collaboratively enacted by people in locally grounded endeavors and tied to other material practices through arguments. Here is the heart of rhetoric rigor and sustainability, both of individual projects and of the disciplinary research endeavor.

Conclusion

In *After Method: Mess in Social Science Research*, John Law captures the spirit of ecological phenomenon, ecological thinking, and rhetorical acting that we present here:

> What we are dealing with here is not, of course, just method. It is not just a set of techniques. It is not just a philosophy of method, a methodology. It is not even simply about the kinds of realities that we want to recognize or the kinds of worlds we might hope to make. It is also, and most fundamentally, about a way of being. It is about what kinds of social science we want to practice. And then, and as a part of this, it is about the kinds of people that we want to be, and about how we should live (Addelson 1994).[10] (10)

At stake in a discipline's metaphors of the research process is not just academic knowledge making that accrues cultural capital for individual, institution, and discipline. At stake is a way of living, a way of being, that fosters and supports the emergence of humane worlds and citizenry.

We believe that research in conventional and new media writing can be powerfully conceptualized as ecologically driven and rhetorically enacted. We concur with Haraway that knowledge is rhetorical, "the persuasion of the relevant social actors that one's manufactured knowledge is a route to a desired form of very objective power" (*Simians* 184), and we concur with her that knowledge is also material. The goal, Haraway counsels, is to "have *simultaneously* an account of radical historical contingency [a rhetorical account] for all knowledge claims and knowing subjects . . . and a no-nonsense commitment to faithful accounts of a 'real' world" (187), a necessarily contradictory mission that we get to through our allegiance to the metaphoric harmony of an ecological approach to phenomenon, research, and enactment. To research well, scholars need to think ecologically and research rhetorically; they need to recognize the impact of their own location, their material practices, and their language. A discipline can only "know" because of where the act of "knowing" is itself positioned in an ecology of factors: a textual-material place, a historical moment, and an array of textual-material actions. Effective and ethical research—sustainable research in rhetoric and writing studies—can be beneficially guided by ecological thinking rhetorically performed wherein the dynamic relationship of actuality and possibility, *kairos, to prepon,* and rhetorical rigor are integral. Here we find an intellectually and aesthetically powerful harmony among what we research, how we envision the methods of research, and how we enact those methods.

Notes

1. The concept of metaphoric harmony ostensibly appears to suggest that any metaphor used consistently across phenomenon, research orientation, and enactment would produce the kind of resonance that we argue for here. However, as Keller points out, "for any given line of inquiry, it is conspicuously clear that not all metaphors are equally effective for the production of further knowledge" (*Secrets* 33). We believe that an ecological metaphor is our best option for "production of further knowledge" for three important reasons: (1) it is an apt metaphor for the phenomenon of writing, especially writing on the cusp of the twenty-first century; (2) it is predicated on the necessity of harmony in that an ecology, complex and messy though it is, exists only through the resonance of multiple transacting networks; (3) it possesses the seeds of its own change because an ecology, responsive to the ambient environment, evolves with that environment. Thus, an ecological metaphor by its nature holds the possibility of its own evolution into something else. It provides a mechanism for acknowledging its own limits. As with any meta-

phor, the trope of ecology hides some aspects of writing while foregrounding others. But a value of the ecological framework is that it underscores its own situatedness, its boundedness, requiring scholars to look for those hidden limits.

2. Cooper makes a similar argument about theoretical models: "But theoretical models even as they stimulate new insights blind us to some aspects of the phenomena we are studying" (3).

3. Because of space limitations, we were unable to discuss how students might be taught to rhetorically enact an ecologically oriented research project. This is an important issue, one that offers a four-part, rather than a three-part, metaphoric harmony. We are currently working on a response to that question.

4. Ecology has been used in a variety of ways and by a variety of scholars associated with literacy and writing studies from Rosenblatt's concept of transactional reading, which Rosenblatt associates with the work of anthropologist-ecologist Gregory Bateson, to David Barton's idea of writing as an ecology, which Barton also ties to Bateson's early work. In addition, writing has been associated with ecology in terms of the intersections of writing and natural environments from writing about natural environments to writing in natural environments.

5. At first, ecological projects focused solely on plants, examining an "ecosystem," which consisted of a community of flora (an assemblage of species) engaged in complementary uses of a habitat, joined in a division of labor, and forming a distinguishable adaptive unit (Hawley). At the beginning of the twentieth century, the concept of ecology shifted to the human sciences, migrating from biology to sociology as researchers sought new ways to understand the phenomenon of rapidly burgeoning cities in the United States.

6. An implication of this emergence is that, as the linkages erode, so erodes the identity of the symbiotic cluster. For example, as experiment becomes tied to a myriad of other clusters, most significantly statistical analysis methods, the constitution, thus the identity, of the cluster called positivism likewise mutates.

7. DiPardo and Sperling cite D. F. Labaree, "Educational Researchers: Living with a Lesser Form of Knowledge," *Educational Researcher* 27.3 (1998): 4–12.

8. We are not the first to propose a rhetorical way of doing research. Focusing on computer-mediated communication in their book *Opening Spaces*, Patricia Sullivan and James Porter posit a "'rhetorical methodology' based on viewing computer writing as a situated practice" (9). They describe their theoretical position as rhetorical, involving local/contingent knowledge grounded in local, situated practices, and they liken the methodology used to study these contexts to rhetorical invention (10). Sullivan and Porter see methodology as "an intervening social action and a participation in human events" (13), resonating with the orientation we advocate here.

9. This is especially important given the mutable nature of any genre, including the genre of research writing, and the rapidly increasing technological modes of dissemination, such as online journals, multimedia research project websites, and DVDs.

10. Law cites Kathryn Pyne Addelson, *Moral Passages* (New York: Routledge, 1994).

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