An Ecology Metaphor for Educational Policy Analysis: A Call to Complexity

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Educational policy might productively be conceptualized with an ecology metaphor. Each policy, thus considered, exists within a complex system that reflects varied international, national, regional, and local dynamics. Using this metaphor provides policy analysts with a view of the regularities and irregularities of any policy, its process, its texts, its reception, and its degree of implementation. The characteristics of policy ecologies alert analysts to the possibilities of great transformation, for good or ill, and give them a way to conceptualize how such transformations occur. Perhaps most important, using an ecology metaphor suggests specific ways that progressive researchers might positively intervene in the policy process.

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Policy creation is an extremely complex, often contradictory process that defies the commonly held image of singular purpose and open, effective planning. The policy process is assumed by many to function rationally, usually following a straightforward model: problem → research → solution → implementation (e.g., Lasswell, 1951). This rational model, often called the *stages heuristic,* was developed most intensively in the 1960s—although it is still used today—and was intended to help governments achieve technically sound policy formulation and resource allocation (see deLeon, 1999; Sabatier, 1999). In the traditional view, solving educational problems requires finding the one likely solution on which to base policy, then using the resulting policy as a lever for predictable and efficient changes. Such a view relies on an assumption of value-neutral decision making, ignores issues of power, and underestimates the highly contested nature of education. It also relies excessively on assumptions of rationality and the power of human beings to fully understand intricate actions and events. The traditional view, further, grossly misjudges the complexity and grittiness, the false starts, the unabashed greed, and the crashing failures of some policy formation and implementation.

Some analyses of the policy process, particularly since the 1980s, have moved away from such traditional and functionalist views, adding needed complexity to the interpretation of how groups create and implement policy. Kingdon's (1984) theory of policy streams coming together at *windows of opportunity,* for example, brought with it an understanding of policy as being sometimes capricious and difficult to manage. Punctuated equilibrium theory (Baumgartner & Jones, 1993) also attempted to theorize complexity, mainly by explaining how policy domains can be characterized by long periods of stability and incremental change but still can be interspersed with short periods of great change. These and other contemporary policy theories (see Sabatier, 2007), however, still rely on many rationalist and functionalist underpinnings, fail to capture the full complexity of policy contexts, or cannot account for all of the various components that influence policy making and implementation across time.

Some policy theorists in education, in particular, have moved toward more complex post-structural, postmodern, and critical theory perspectives on the policy process. Ball (1998) perhaps best summarized this view of policy:

> National policy making is inevitably a process of *bricolage:* a matter of borrowing and copying bits and pieces of ideas from elsewhere, drawing upon and amending locally tried and tested approaches, cannibalising theories, research, trends and fashions and not infrequently flailing around for anything at all that looks as though it might work. Most policies are ramshackle, compromise, hit and miss affairs, that are reworked, tinkered with, nuanced and inflected through complex processes of influence, text production, dissemination and, ultimately, re-creation in contexts of practice. (p. 126)

In addition to such complexities, others have justifiably argued that traditional views of policy as neutral and working in the best democratic interest belie the true impact of policies. Prunty (1985), for example, in defining *critical policy analysis,* ruptured the notions that policy can be value free and that its purpose is simply the smooth functioning of the state and its institutions. In his view, policies serve the interests of specific people, usually the already powerful. Policies are, in other words, inherently political. In this critical, post-structural view, policies are (a) crucial in their physical and graphic form as well as in their textual content; (b) multidimensional, with many stakeholders; (c) value laden; (d) intricately tied to other policies and institutions; (e) never straightforward in implementation; and (f) rife with intended and unintended consequences (Taylor, Rizvi, Lingard, & Henry, 1997).

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Studies from all over the world have used this post-structural and critical theory view of policy. Ball (e.g., 1994a, 1994b, 1998) challenged the narrative of straightforward policy formation and implementation with his work on the major 1980s educational reforms in England. Eisenstein (1991) showed an insider's view of the complicated and clever ways that "femocrats" (the Australian coinage for feminist bureaucrats), by working in both the foreground and the background of the policy process, pioneered policies for women and girls in Australia during the 1980s. More recently, McNeil (2000) persuasively demonstrated the negative, unintended effects of standards and testing policy on students in Texas, which have been particularly harmful to the poor and to oppressed racial and ethnic groups. Mary Lee Smith (2004), too, showed how U.S. policies on urban reform, testing, business partnerships, and school choice function more as *political spectacle* (a theory developed first by Edelman, 1988) than as true reform to aid the marginalized.

Despite these nuanced critical studies, many policy analyses continue to conceptualize policy as self-contained, as bounded simply within a local or national context and lacking significant impact on other policies, people, institutions, and social dynamics. For example, regarding comparative higher education policy analysis, Marginson and Rhoades (2002) argued that "the field lacks a framework for conceptualizing agencies and processes that extend beyond the nation state" (p. 285). Furthermore, they observed, scholars undertheorize national effects and ignore local actors' participation in larger domains. I argue that much educational policy analysis in other subfields also suffers from these shortcomings. As a potential remedy, I suggest viewing policy contexts as *ecologies.* An ecology metaphor, as my subtitle suggests, is a call to complexity for policy research, an appeal to researchers to theorize and account for the many interconnections that create, sustain, hold off, or destroy policy formation and implementation.

How might one build a metaphor for policy that accounts for all of its complexity? How might one systematically study the contexts of a policy, without which "it is neither possible to adequately understand the policy nor to strategise a response to it" (Taylor et al., 1997, p. 20)? Some might recoil from grand metaphors, but such metaphors can help us to conceptualize our subjects in revealing ways. Theories and metaphors can shed new light on (or sometimes obscure) important elements of an event, phenomenon, or system, and they guide the ways that we think and act in the world (Cook-Sather, 2003; Lakoff & Johnson, 1980).

The ecology metaphor helps us to conceptualize policy processes as complex, interdependent, and intensely political. It models policy processes on concepts from the natural sciences, bringing new understandings and attention to often overlooked aspects of policy creation and implementation. The metaphor of an ecosystem is more appropriate than one of *stages* or *circuits* because the interactions of environments, groups, and events capture better the fluidity of policy processes. The metaphor grows most clearly from a *conflict* paradigm for studying human social activity (e.g., Collins, 1971; Sadovnik, 2007) because it not only allows for but actually incorporates the messy workings of widely varying power relations, along with the forces of history, culture, economics, and social change.

Throughout this essay, I use a critical, post-structural framework for policy analysis that revolves around a metaphor of policy contexts as ecologies. I detail the multiple levels of policy at which an ecological metaphor works, outline the characteristics of policies and their environs, and provide an example of processes at work in connection with boys' education policies in the United States. My aim is to demonstrate the many benefits of using a policy ecology metaphor. One salient benefit is the strategic implications for progressive scholars and those who seek democratic transformation in educational policy and practice—points that I elucidate at the end of the essay.

The Ecological Metaphor in Education Research

Certainly, I am not the first to use metaphors of complexity to describe social systems. Indeed, holistic views of this sort have precursors in various indigenous knowledge systems stretching back perhaps thousands of years. In Western academia, too, many analysts have attempted to map the intricate interrelationships of organizations and the social world. They represent traditions such as activity theory (e.g., Engeström, 1996), general systems theory (Banathy, 1996; von Bertalanffy, 1968), systems analysis (see Apple, 2004, chap. 6; Easton, 1965b; Wirt & Kirst, 1997), and chaos and complexity theory (see Davies, 2001; Lorenz, 1993).

The specific concept of ecology, too, has gained acceptance in numerous fields tasked with understanding complicated systems, including human ecology (e.g., Hawley, 1944, 1950, 1968), organizational theory (Carroll, 1984; Levitt & March, 1988), and population ecology (Hannan & Freeman, 1977). These formulations, however, tend to remain at the macro level of organizations, focused on organizational change and demise, with little attention to how policy is made. In the late 1970s, Bronfenbrenner (1979) used an ecological metaphor to describe the environmental factors that contribute to psychological development, thus taking psychology from the individual head out into the world. Family research, too, has productively used ecology to conceptualize the intricate workings of families (e.g., Bubolz & Sontag, 1993).

Numerous analyses in the field of education have turned to ecology metaphors as well. In *The Ecology of School Renewal,* for example, Goodlad (1987) theorized reform and leadership through a metaphor of ecology; Baker and Richards (2004) theorized the same subjects in *The Ecology of Educational Systems.* Barab and Roth (2006) conceptualized curriculum as an ecosystem. In fact, scholars have applied ecology metaphors to educational topics as diverse as bullying (Espelage & Swearer, 2004), teacher professional knowledge (Clandinin & Connelly, 1995), parental involvement (Barton, Drake, Perez, St. Louis, & George, 2004), absenteeism (Cameron, 1993), and special education (Odom, Brown, Schwartz, Zercher, & Sandall, 2002). However, many—although not all—of these analyses used the ecology concept thinly, often only as synonymous for *environment* or *surroundings.*

Even within policy studies, some theories have approached ecological conceptualizations (e.g., Guthrie, 1992). Easton's (1965a, 1965b) famous work on policy, for example, demonstrated a rather thin use of *environment* for political systems, although it nevertheless expanded political science's view of the process as implicated in wider contexts beyond supposedly closed policy-making arenas. Indeed, Easton (1953) wrote,

> We must recognize . . . that ultimately all social life is *interdependent* [italics added] and, as a result, that it is artificial to isolate any set of social relations from the whole for special attention. . . . Since everything is related to everything else, the task of pursuing the determinants of any given relation would be so vast and ramifying that it would defy any tools of investigation available either to the social or physical sciences. (p. 97)

Clearly, Easton viewed social and other environmental relationships in policy systems as complexly interrelated.

The notion of ecology, in fact, has already been used to describe education policy. Firestone (1989), building on Long (1958), argued that educational policy might productively be thought of as an *ecology of games.* In Firestone's view, many social games—such as the classroom game, the research game, the district game, and the legislative game—operate within the educational system, and these games interact in an ecological way.

I am building on Firestone's work, similarly conceiving of the social fields of policy as interconnected entities. Significant differences between his and my conceptualizations deserve note, however. Most important, I eschew the game metaphor that dominates in Firestone's theory, because game theory is inconsistent with a critical, post-structural view of policy.

First, as Long (1958, p. 252) readily admitted, the word *game* often suffers from a connotation of inconsequence ("It is *only* a game!" some might say). Policy, though, can literally be a matter of life or death for some. Describing it as a game can lead to underestimating the true stakes.

Second, in many ways the game metaphor simply does not fit the ways that policies and policy formation actually operate. The *goals* of policy participants—in game theory a vague notion of winning—may not be shared by all "players." Indeed, winning may not be a goal at all. Victories are almost always partial and temporary, and what some hope for is stalemate—the status quo—rather than victory. For example, those who resist the dismantling of affirmative action policy in higher education see the status quo, ironically, as something to fight for because it includes numerous real but threatened gains for African American and Hispanic American groups and for women.

Also, unlike players in a game, actors in a policy process may have multiple roles, with the result that they can play on several competing teams simultaneously. A teacher, for example, might also be a parent and write a column for a local newspaper, thus competing within and across three games at once. Moreover, roles within a policy milieu can be unclear or even unknown to those holding them, unlike roles in a game. Long (1958) claimed that in a game, "at the very least [the players] know how to behave, and they know the score" (p. 253); that is not always the case in policy conflicts. Some policy "players" do not know the rules, use the rules irrationally, cheat, or fail to keep up with the results (the *score*), but they participate in the process nonetheless.

A third difference between policy processes and games is that policy players sometimes aim at changing the rules of the game rather than winning within the existing rules. Strategies and tactics—staples of game theory—may not work in every policy ecology, especially when a situation is novel or only slightly altered.

Beyond the problems with the game metaphor, Firestone (1989)—and before him, Long (1958)—applied the term *ecology* in a relatively thin way, mainly as synonymous with interconnection and mutual need. Although these are indeed the key elements of an ecology, Firestone and Long did not adequately incorporate the contextual connotation of ecology, the interaction of actors and organizations with the environment. In this way, the ecology-of-games metaphor undertheorizes the historical, economic, and cultural inflections within the social field of policy. The metaphor fails to account adequately for powerful dynamics that shape ecologies, particularly gender, race, and class. Moreover, it does not satisfactorily detail the interactions with concurrent and previous policies.

For these several reasons, a metaphor for policy as an ecology of *games* will not suffice. Instead, in this article I define what I mean by *policy ecology*—eliminating the idea of games—and discuss the implications of using this metaphor.

The Characteristics of Policy Ecologies

In the life and physical sciences, *ecology* refers to a system of relationships among organisms and between organisms and their environments. In North American arboreal ecologies, for example, relationships exist among wolves, deer, plants, mice, birds, insects, microbial life forms, and human beings. Relationships also exist among these plants and these animals and their environments—the air, water, soil, sunshine, temperatures, wind, and rain, and the combinations of chemicals in them all. Each factor and organism has influence on the others, and many complex interrelationships among them are required to sustain the system. A *policy* ecology works in similar ways; as with any metaphor, however, there are divergences (not all biological processes correspond to human social processes, and vice versa).

As I formulate it, a policy ecology centers on a particular policy or related group of policies, both as texts and as discourses, situated within the environment of their creation and implementation. In other words, a policy ecology consists of the policy itself along with all of the texts, histories, people, places, groups, traditions, economic and political conditions, institutions, and relationships that affect it or that it affects. Every contextual factor and person contributing to or influenced by a policy in any capacity, both before and after its creation and implementation, is part of a complex ecology.

This ecological view demands analysis beyond the politicians who construct a policy or the educators who may or may not enact it in classrooms. An ecological analysis looks at the media, parent groups, religious groups, printers, travel agents, spouses, and all other persons or institutions that allow the process to work, no matter how insignificant their role may appear at first glance. It also necessitates understanding the broader cultures and society in which a policy resides. Limits, of course, are necessary on how deep any analysis can go, but the ecology metaphor's usefulness lies in its ability to extend analysis further. One cannot easily push the limits of a stages metaphor, but one can expand analysis using an ecology metaphor.

What does a policy ecology consist of, then? In general, the characteristics that a policy analyst might examine in any ecology can be broken down into four categories derived from literature on both social and natural ecologies: *actors, relationships,*

environments and structures, and *processes* (summarized in the appendix).

Actors

An ecosystem's actors are multiple and, in the natural world, depend on a certain amount of biodiversity so that the system's many roles—providing energy, controlling population, processing waste, and so on—can be performed. The complexity of biological ecologies has corollaries in social worlds, for many groups and actors are necessary to perform society's various roles. We have people who care for the ill, people whose illness makes care providers necessary, people who create waste, people who remove the waste, students who need teachers, teachers who need students, administrators who need them all, policy makers who guide them all, voters who decide who makes policy, the media that report it all, and so on. Also, as noted earlier, individuals fill many roles simultaneously. Politicians are often also parents, and both are also voters. In this and other ways, then, ecologies are not reducible to their component parts (Laura & Cotton, 1999); rather, they must be viewed as whole, functioning systems. Of course, some actors are more powerful than others within a system, and determining who these powerful actors are is a core task in a policy ecology analysis.

Relationships

The actors in an ecosystem are more than space sharers. They also exist within complex relationships of four basic types. First, in a relationship of *competition*, especially in democratic, capitalist economies, actors compete for scarce resources and limited power. Second, in a relationship of *cooperation,* actors work together for common goals. Cooperating groups can bind together or break apart, depending on the issue, such as, say, cooperation between conservative and liberal groups in the United States fighting against Channel One, the television news and advertising program shown to "captive" student audiences in schools (Apple, 2000). Third, in a relationship of *predation,* certain actors prey upon others, eliminating them or taking resources from them for personal gain. In policy, predation can occur when legislators vitiate programs designed to help the poor or oppressed, for example, when they cut after-school programs in favor of test preparation for the college bound. Finally, in a relationship of *symbiosis,* actors coexist interdependently for mutual gain, although they are not actively cooperating. University researchers, for example, share a symbiotic relationship with the government bureaucracy in most nations; governments need information, and researchers, in turn, need funding and direction (Firestone, 1989).

Environments and Structures

All of the actors and groups, and even the relationships among them, interact with and are influenced by the environment and by social and institutional structures.

Boundaries are an important facet of the environment and structure of an ecology. Policies, most obviously, have jurisdictional boundaries, from local ordinances to international law. Not all boundaries are clear-cut, however. It is difficult to conclude that one actor has no part or feels no impact, and it is difficult to conclude that one phenomenon—say, the economy—has no influence. Boundaries exist, but they can be difficult to discern with accuracy.

Within boundaries, actors face the ecology's *extant conditions* that—because ecologies are constantly changing—precede the moment of analysis. Extant conditions in human social ecologies may include the economy, social change, poverty, crime, infrastructure, foreign relations, and culture in general. History and tradition, not to mention existing dynamics involving race, class, gender, and religion, are also influential. To varying degrees, these conditions and dynamics structure future possibilities and define the lines along which competition, cooperation, and predation occur.

Some of these existing dynamics create *pressures* toward change, whether positive or catastrophic. Powerful groups or oppressed groups may agitate for policy change; for example, immigrant groups may actively seek equal educational resources.

An ecology's successful functioning also depends on the *inputs*—funding, information, and other resources—that are available to actors. Pressures can occur when inputs substantially decrease (or even sometimes when they increase), as when universities expand distance programs or international enrollments to stem falling student numbers or to compensate for lower state funding.

Related to both pressures and inputs is *consumption.* Policy ecologies can, for example, suffer problems of overconsumption by certain groups, as when particular groups acquire more resources than their fair share (however one defines *fair*).

In addition, ecologies have *niches and roles,* some of them well defined, that actors must fill. Politicians and the bureaucracy, for example, often have roles structured by constitutions or traditions of government, although these roles may be loose in numerous ways. Other niches and roles exist outside the state's anticipatory abilities, such as the roles of oppositional groups that foment change.

This last understanding—that some groups are resistant—underpins the notion of *agency,* through which actors, depending on their resources and power, are able to change ecological systems to their own benefit. Ecologies allow for agency because of their *adaptive decentralization* (Baker & Richards, 2004). That is, ecologies do not have centralized mechanisms of control; there is no puppet master ensuring that all goes right, no "they" who can fix all problems (Long, 1958, pp. 255–256). This characteristic of ecologies leaves room for the agency of individuals and groups.

Processes

Although actors share relationships and interact with their environments, these dynamics are rarely stable. Rather, they involve numerous active processes in constant change, depending on which pressures and influences are in ascendance. In the process known as e*mergence,* ecologies create and are created by other ecologies (Baker & Richards, 2004). New subecologies can emerge if conditions for self-sustenance are available. *Entropy,* the opposite pole on a continuum with emergence, occurs when an ecology breaks down and becomes disordered. For example, in a policy ecology, entropy occurs if a legislative committee cannot function or if compromises cannot be reached.

One response to entropy is *adaptation,* a change in the ecology or in the pressures on it that returns the system to equilibrium.

Schools, for instance, may adapt their structures to fit new policies or else adapt the policies to fit their existing structures. *Conversion* is an extreme instance of adaptation; it occurs when the most basic properties of the ecology change. Examples of conversion are the establishment of new rules for public comment in an otherwise closed policy system, or an extreme shift from a totalitarian system to a democratic one.

Entropy can also lead to *fragmentation,* a situation wherein ecologies are split or dissected, as when a governmental body—such as a ministry or department—is divided in two. In a catastrophic process that ecologists call *succession,* an entire institution may be wiped out and another installed in its place. Fire often causes succession in the natural world; in human social ecology it is often the result of changing political fortunes as conservatism and progressivism battle for hegemony.

Several processes can mitigate or avoid ecological entropy. One is *conservation:* Members of a system may explicitly work to conserve resources and thus stop breakdown. Policy itself can be a tool of conservation, and within policy ecologies various actors attempt to conserve or redistribute available resources. Baker and Richards (2004) suggest two other processes that can mediate entropy. *Anticipation,* inherent in all ecological systems down to the level of bacteria, involves predicting the future needs of members. Often policy legislates in advance of a need, setting out the contours of an ideal situation rather than reacting to present ills. The process of *redundancy,* too, inheres in all ecological systems, providing multiple, overlapping responsibility for needed roles. Thus, if one actor or policy fails, others take its place.

In summary, the interrelated actors and relationships in a policy ecology are awash in complex environments and structures undergoing various processes of change and equilibration. It is all very complicated, just as the critical and post-structural turns in educational policy studies suggest. Still, whatever anxiety is provoked by its complexities, the ecology metaphor is useful. It encourages analysts to look more deeply into policy processes, beyond the "big players" in the foreground. It also encourages a broader look at the effects of policy and policy processes because it suggests that the ripples of a single policy or process can be felt widely.

Overall, viewing policy through an ecological lens has tremendous advantages, which I will enumerate more fully in a later section. Like all metaphors, however, the ecology metaphor is not without dangers and blind spots. In particular, analysts should be wary of extrapolating from an ecological view that policy is somehow "natural" or that it should be seen as an organic, inevitable outgrowth of human needs for social regulation. The policy process, rather, is created and constructed, and it is always already manipulated by those with the greatest social, political, cultural, and economic resources. Their control takes effect long before the beginning of an inquiry or the first of a Senate subcommittee's meetings. The very conditions for a given decision process—who will conduct it and how—have been determined well in advance by the people in power. There is no moment in a policy process that occurs before the system is rigged. This reality is congruent with the notion that ecologies are dynamic and in flux, and it is congruent with the notion that one of the major environments is a policy's extant conditions. Thus let me stress that I mean the ecology metaphor to represent complexity and interdependence. It does not imply a "natural" and therefore inevitable or acceptable adaptation of political structures to their environs.

What Counts as Policy?

If we are to view policy expansively with an ecology metaphor, as something far more nuanced and gritty than a stages view suggests, we must answer the fundamental, perhaps deceptively obvious, question of what policy is. What counts as policy? This question becomes crucial as governments worldwide move away from rigid, explicit policy toward *steering from a distance* (Marceau, 1993) through standards and accountability systems that eschew direct mandates and instead tie funding to "choosing" to do what governments want—thus making it appear as if the local agencies and actors have control and choices. I argue that today's policies do not always look like policies and are not always named "policies," even when they function that way.

Take, for instance, a U.S. report that one might clearly consider a policy: *A Nation at Risk* (National Commission on Excellence in Education, 1983). Perhaps no other piece of writing has so profoundly affected U.S. education and its reforms, having established economic competitiveness as the dominant motivation for educational reform, the perception of U.S. schools as failing, and standards and accountability as *the* fixes for educational problems. The influence of *A Nation at Risk* led to the creation of policies in state after state, even though federal control of education in the United States historically has been relatively weak (this is changing); and the report continues to shape the Republican Party's approach to federal education policy. *A Nation at Risk,* although technically only a report, has had such major influence that we could reasonably call it a policy—one that has been implemented in U.S. education for 25 years now.

Understanding policy through an ecology metaphor demands that analysts take a broader, more inclusive view of what policy is and can be. Two key theories might help in defining the boundaries of policy.

First, Ball (1994a) viewed policy as dual: both as *text* and as *discourse* in the Foucauldian sense (e.g., Foucault, 1972). As *text,* a policy is a physical document with readable words. As such, it invokes issues of authorship and reader response. Neither readers' interpretations nor authors' intentions have privileged status, but a concrete, analyzable document nevertheless exists that can be read, and the author can choose language in an effort to control interpretation. The traditional policy analyst easily operates at the textual level of analysis. In contrast, the view of policy as *discourse* entails the ways that policies "exercise power through a *production* of 'truth' and 'knowledge'" (Ball, 1994a, p. 21). In other words, policies bid to control what is thinkable, what counts as fact, and who counts as expert. With the state's imprimatur and legitimacy behind it, not to mention the state's control of massive funding, government policy wields significant control over what can be thought, said, and heard and by whom.

Second, Lingard (2003) argued in connection with education policy that some texts that are not policies per se can be used as *de facto policies* in a context of increasing site-based management

and weak state control. In other words, when formal policy does not exist, practitioners look to other sources, such as popular books or advocacy-style reports, to solve the problems they face. The difficulties of academic research—its length of production, its specialized language, and its often limited accessibility—intensify this effect (e.g., Firestone, 1989; Rist, 2003). To use Lingard's example, individual educators and schools in several countries recently have looked to popular books on boys for formulating their approaches to boys' perceived educational "crises," thus allowing those texts to *become* a kind of policy despite their many shortcomings (e.g., Mills, 2003). In my own fieldwork with Australian schools that were implementing boys' education programs (Weaver-Hightower, in press-b), I too found extensive use of these popular texts rather than official policies.

Key elements of policy ecologies might escape notice if analysts do not explore these notions of de facto policies and policies as texts and discourses. Documents that *act in the capacity of policy* create or uphold particular discourses or become de facto policy in the absence of mandates. Such quasi-policies are pivotal to the workings of many policy ecologies.

Questions remain, however, if we are to expand the definition of policy. Is everything policy? Is there a threshold that must be attained before something becomes policy? How do we determine what to rule out? Hard-and-fast rules would be difficult to agree on, and an ecological metaphor suggests keeping any such rules loosely defined. Nevertheless, we might first consider anything at any level that fits a basic definition of policy—"the authoritative allocation of values" (Easton, 1953, pp. 129–134)—whether or not those who created it (as formal text and discourse or as de facto) wish to call it policy. An elementary school principal's policy on bathroom privileges, for example, exists in an ecology just as federal policy on special education does.

Levels of Policy

The ecological metaphor also demands that analysts account for the multiple levels at which policies interact, exert or receive influence, are created, and are implemented. Such thinking in terms of interconnections is a particular strength of the metaphor.

Figure 1 illustrates one possible policy ecology (specific ecologies will vary with local and national specificities). The ecology represented in the figure is laid out to read in various directions. In one, the policy takes a central location because, for brief or long periods, it brings together arrays of people, institutions, leaders, followers, and social fields of power (Bourdieu, 1993). These elements both encircle and radiate from the policy in a web of influence, contribution, and membership.

One can also read the figure *roughly* chronologically and organizationally, from top to bottom. I say roughly because those at the bottom also contribute at the top, and those at the top may contribute throughout. Contributors to and catalysts of the process, including the media, witnesses, teachers, administrators, and academics, pass along their thoughts, arguments, and interests to policy makers. The state then constructs a policy—or at least a document that *functions* as policy. The government disseminates the policy to those responsible for implementing it, sometimes disseminating it directly but often in a mediated form—*recontextualized* (Bernstein, 1977)—through state departments of education, teacher training, educational materials (both governmental and commercial), and government-sponsored conferences. This passing "down" of responsibility occurs through organizational structures and across time.

The policy ecology metaphor is also well equipped to explicate social *power distributions* in policy processes, not only illuminating complexity and influences but also weighing the impact that each actor has in shaping the focal policy. Just as an individual animal species in nature may have less influence on forests than does fire, so elementary students—even in groups—usually have less influence on national education policy than do individual politicians. Taking an ecological perspective, then, calls for the assessment of the impact of various actors, relationships, environments, and processes.

Figure 1 demonstrates a potential exploration of these interconnections that analysts might perform. The tangle of lines connecting the shapes indicates the directions of power flows and the relative strengths of relationships, although not the relative power of each agent (an analyst *could* show relative power graphically, however). The solid arrow lines indicate major avenues of influence; these are the *structural* channels that allow for formal exertion of influence. The major influence flowing from commenters and witnesses (upper left oval in the middle box) to the federal government, for example, could be a result of public comment being explicitly structured into the policy process.

The dotted lines, alternately, represent more *informal* influences or contributions. These channels are not necessarily weaker than the major lines of influence, but they are situated differently in relation to the policy and process. The media (star, top center of the middle box) exert perhaps the most influence on ideologies and discourses of any actor in Western, industrialized contexts but not in any formal, structurally defined way. The media, of course, are also influenced by actors from within and without, and they clearly represent and legitimate the interests of the dominant actors in other areas of the figure.

The fork-ended lines, finally, represent the intergroup flows of membership, tracing the particular ways that individuals are members of multiple groups simultaneously. This is a key consideration, for tracking *human capital* as it flows between social fields becomes an important indicator of the formation of alliances, the political might of groups within a representative democracy, and often the flow of every other type of capital—economic, cultural, and social (e.g., Bourdieu, 1984). Mapping these memberships reminds us that policy is not simply creating a text or artifact but is rather a struggle among human beings for validation or funding of their own interests, meanings, and forms of knowledge.

As Figure 1 demonstrates, the policy ecology metaphor is important because it distinguishes within the state policy process what I call *purposive interdependence.* Each group within the ecosystem depends on flows of human, economic, social, and cultural capital for its survival. Action is purposive because each actor or group has its own needs and interests that it works to meet and maintain. Yet each actor or group is also interdependent because to meet its needs it depends on the other actors—and they on it. This dynamic is similar in important ways to that outlined in

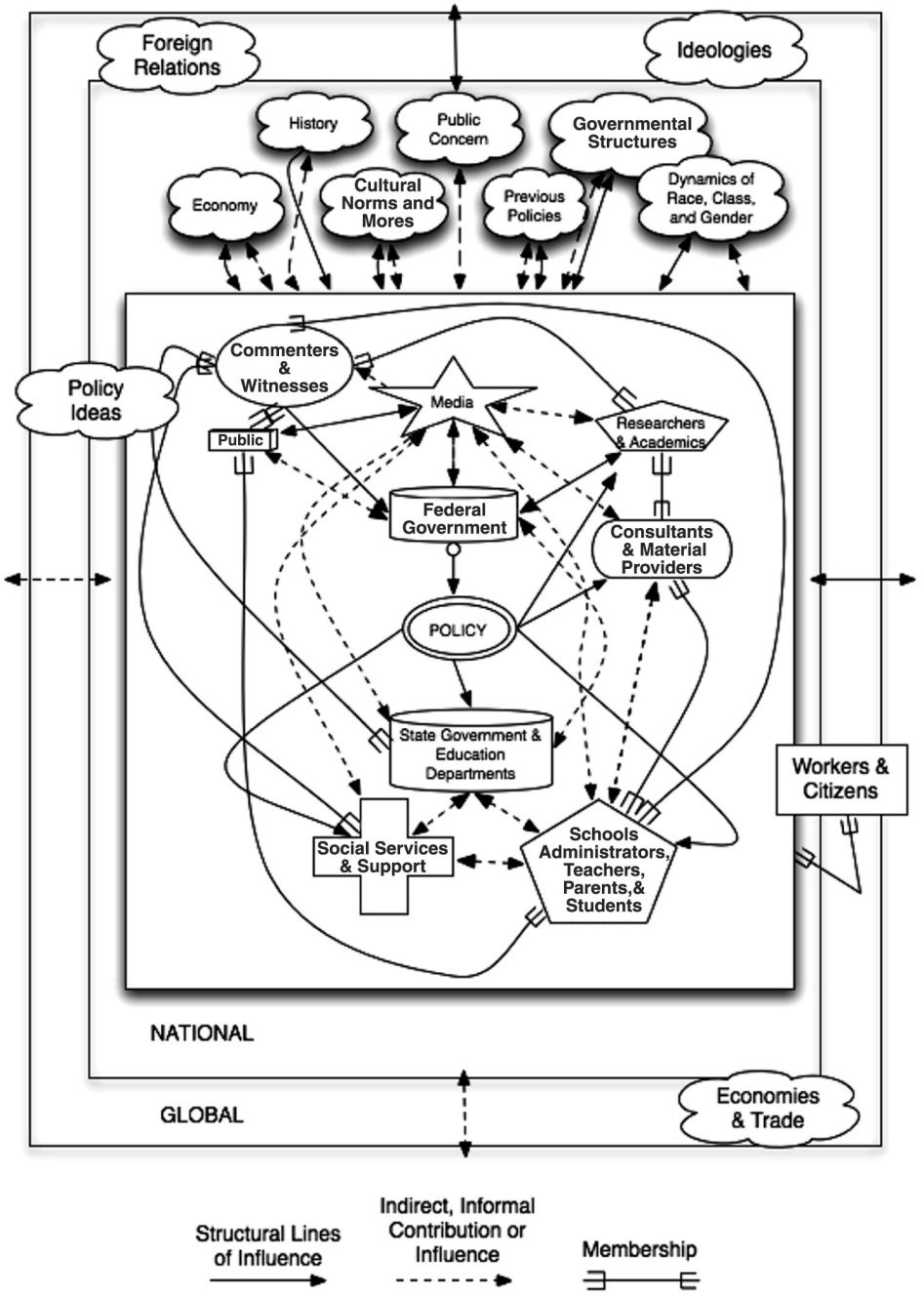

FIGURE 1: *An example of a policy ecology.*

resource dependence theory (Pfeffer & Salancik, 1978), but in the ecology conceptualization, the actors involved do not necessarily know about or plan for their interdependence with others.

Also apparent in the figure is that policies are deeply embedded in other levels of discourses and governance—regionally, nationally, and internationally. Marginson and Rhoades (2002) demonstrated such interconnections of levels in their notion of a *glonacal agency heuristic,* where *glonacal* combines *glo*bal, *na*tional, and lo*cal* influences, particularly in higher education policy. For me and for them, policy domains (ecologies) contain *flows* of discourses, in the sense used earlier, as controls on what is thinkable and on who has permission to speak.

Flows of capital, images, and ideologies circulate among all societies in complex ways, and, despite the normal connotation of *flow,* these circulations are not unencumbered or unregulated (Lash & Urry, 1994). In the modern world, they are decidedly globalized (Appadurai, 1996). The globalization of discourse flows explains how nations in vastly different parts of the world can simultaneously hold debates on the comparative value of phonics over whole language or move simultaneously toward the privatization of education. These flows also show up in politicians' active

borrowing of legislative and electioneering tactics from political parties in other nations.

It should be noted that all flows of discourse and information do not have equal political footing. Some discourses are more available than others, and certain groups have better access than others to particular discourses, mainly through gatekeeping mechanisms and logistical constraints. Gatekeepers control the flow of academic research, for example, because who gets into a university or who can check out books from university libraries affects who can access scholarly work. Logistics are key, too. Popular press books are available at local libraries; they also usually cost less than academic press books and require less time and less specialized education to read. The Internet is changing this situation, but the basic dynamic remains.

All of this discussion demonstrates that policy, again, is highly and inherently political, like all other aspects of education. Policy is complex and subject to constraints that policy makers sometimes cannot overcome, control for, or even recognize. Therefore, conceptualizing policy as an ecology can be powerful for the analyst. It requires that the analyst look at the history and culture of a place, its many actors, their relationships, and the larger national and international dynamics involved.

An Example: The Slow (or Nonexistent) Progress of Boys' Education Policy in the United States

So far, I have given small policy examples to illuminate facets of the policy ecology metaphor. One strength of the metaphor, though, is that it provides deep understanding of full ecological systems, even when the ecology prevents policy. To make the benefits of a policy ecology metaphor concrete, I want to give such an example of a nonpolicy. Specifically, I want to discuss the elements of the policy ecology in the United States that have restricted the formation of national policy on boys' education. (These elements were defined earlier as types of relationships, environments or structures, and processes; I italicize them again in this section for emphasis. Also see summary in the appendix.) Because boys' education has been the subject of national debate and policy making in other countries, particularly Australia (House of Representatives Standing Committee on Education and Training, 2002) and the United Kingdom, the question arises why similar large-scale policies have not emerged in the United States, despite much media attention to the issue (Kimmel, 2000; Weaver-Hightower, 2003, in press-a). Instead, policies on boys in the United States have been diffuse, conservative, structurally and legally constrained, and localized.

Gender issues have been on the U.S. educational agenda for well over a century. In the 19th century, educators heavily criticized and debated coeducation (e.g., Clarke, 1873), and by the turn of the 20th century there was already panic over a "crisis" with boys (e.g., Forbush, 1901). The same concerns have reappeared periodically (e.g., Sexton, 1969; Tyre, 2006), bringing varied instances of policy-ecological *competition, cooperation,* and *predation* as actors struggled to legitimate or resist feminism.

With the *emergence* of second-wave feminism in the early 1970s, however, a *conversion* took place in the policy ecology: The focus of gender policy rightly turned to girls' educational difficulties (e.g., Frazier & Sadker, 1973; Women on Words and Images, 1972). Title IX, the law prohibiting sex discrimination in educational programs receiving federal funds, was created during this early period and made a significant impact that continues today (e.g., Sandler, 2002; Secretary of Education's Commission on Opportunity in Athletics, 2003; Suggs, 2005). Scholarship on girls' education has continued, but the pressure for girls' issues peaked in the early 1990s, particularly after high-profile reports (American Association of University Women, 1992) and popular trade books (e.g., Pipher, 1994; M. Sadker & Sadker, 1994) eventually catalyzed federal policy for girls, particularly the 1994 Gender Equity in Education Act. The act brought considerable new *inputs* into the ecology, as government funding briefly flowed to girls' education.

Key changes have occurred in the *extant conditions* of gender and education since the late 1990s, however, with a perceptible *boy turn* (Weaver-Hightower, 2003) occurring in gender and education policy and practice. One might view this turn as a *succession* in the policy ecology. Popular press books have decried boys' educational problems and parents' difficulties in raising boys (Dobson, 2001; Kindlon & Thompson, 2000; Pollack, 1998; Sommers, 2000). In particular, numerous trade books for educators (Brozo, 2002; Gurian, 2001; Newkirk, 2002; Pirie, 2002; M. W. Smith & Wilhelm, 2002) have explored boys' troubles in literacy and behavior. Others warned of declining percentages of males going to college (e.g., Gurian, 2005) and becoming teachers (e.g., Cunningham & Watson, 2002; King, 1998, 2000; Lahelma, 2000; Mills, Martino, & Lingard, 2004; Sargent, 2001).

Much interest has focused specifically on African American boys and their considerable negative social and educational indicators (Fashola, 2005; Price, 2000; R. A. Smith, 2002; Tatum, 2005); unfortunately, part of this interest reiterates the *predatory* tendency of viewing African American males as dangerous or endangered, both of which limit the ability of educators and policy makers to see the positive potential of these boys and their families (Ferguson, 2000; Fultz & Brown, 2008). Concerns about boys have also increased scholarly interest in issues of sexual diversity and queer studies (see, e.g., Martino & Pallotta-Chiarolli, 2003, chap. 5). Numerous scholars, too, have created a *niche* in critiquing and questioning notions that boys are in crisis or disadvantaged at all (e.g., Kimmel, 2000; Mead, 2006; D. Sadker, 2002; Weaver-Hightower, 2005). Nevertheless, even with many actors' diverse interest in boys within the ecology, no major policy initiatives have *emerged* in connection with boys' education.

The explanation for the lack of explicit policy lies in the specificities of the U.S. policy ecology. Governmental and educational *structures* have precluded federal-level intervention on many issues, and boys' education is no exception. In terms of praxis, the U.S. boys' education movement has been constrained by a relatively small private and single-sex school sector, one of the generators of much work on boys' education overseas. Perhaps more powerfully, the Constitutional distribution of responsibility for education to the states has imposed limitations on federal policy. The federal government traditionally could intervene in K–12 education only through civil rights legislation (such as Title IX and desegregation) and judicial decisions, and the law has not traditionally considered boys a protected group. Therefore, in this situation of *adaptive decentralization,* states have been left to their own devices to create policy on boys. Thus far, only Maine has attempted it (Maine Task Force on Gender Equity in Education,

2007). The switch from a boy focus to a gender focus in the Maine policy process (Wack, 2006), however, attests to the powerful cultural and legal conventions that make the creation of boy-focused policy difficult in the United States.

Logistically, attention to boys' education issues has also been constrained by the size of the U.S. population. It is easier to capture the attention of 20 million Australians or 49 million Britons than it is to put such issues at the forefront for approximately 300 million U.S. citizens. Despite an increased media focus (discussed later), the media coverage still gets lost among the comparatively prolific outlets for news and information in the United States.

Culturally, in the United States gender is often equated with women's issues, thus limiting the notion that some boys may be disadvantaged because they are male. In addition, the public's and politicians' attention since the 1980s educational reform movements, and increasingly in the wake of No Child Left Behind (NCLB), has focused myopically on large-scale school reform, including testing, privatization, and accountability schemes. Gender issues have been largely subordinated to these macrolevel reforms, and the resource *inputs* have declined as well, which hurts both boys' and girls' advocates.

A difficulty for boys' advocates, too, is that, partly because of males' considerable privilege and partly because of the conflation of gender with femaleness, little institutional infrastructure exists for men's issues. This lack of *structure* limits *agency* and *inputs.* Any movements that have developed for men's issues have had to carefully navigate the cultural and ideological tensions around gender issues in the United States. These tensions are obvious from the diverse advocates for men, who, for instance, have included mythopoetic and therapeutic groups (e.g., Bly, 1990; Keen, 1991), antifeminist and backlash groups (e.g., Farrell, 1993; Sommers, 2000), conservative religious movements such as Muscular Christianity and Promise Keepers (e.g., Kimmel, 1996), and even profeminist and antiviolence organizations (e.g., Clatterbaugh, 1990). Concerted efforts with singular focus have largely been untenable, given the ideological incompatibility of these diverse groups. Tensions, in other words, limit the *redundancy* that would better sustain a movement for men.

Despite constraints on the growth of boys' education policy, the potential exists within the ever-changing U.S. policy ecology for the *emergence* of boy-focused policy. Media exposure of boys' education issues has been tremendous, with cover stories in *Newsweek* (Tyre, 2006), *Time* (Von Drehle, 2007), and *Business Week* (Conlin, 2003), alongside frequent coverage in local newspapers nationwide and even documentaries on PBS (Stern, 2006) and elsewhere focusing on notions of a boy crisis. Local interventions (*adaptations*), too, have grown exponentially as practitioner and public concern drive the use of de facto policy in individual classrooms, schools, and districts. Teachers increasingly turn to the growing market of books and professional development opportunities to solve their difficulties with boys.

In addition, the above-mentioned focus on testing and accountability creates an environment conducive to the *emergence* of boy-focused policy. In the United States, as elsewhere, boys' achievement in reading and especially writing is behind that of girls (Freeman, 2004, pp. 4–6). Educators fending off accountability pressures from NCLB may increasingly focus on boys as a group in need. Indeed, the increasing control of education by the federal government through policies such as NCLB may make it easier to create policies on boys, even at the federal level.

Cultural and political changes in the United States also support potential growth for boys' education. In the current era of conservative modernization (Apple, 2006) and conservative political dominance, issues of boys' education, largely driven by conservative impulses (Martino & Berrill, 2003), have many adherents among key policy makers. For example, in a press release announcing the publication of the latest Congressionally mandated quadrennial report on the education of girls and women (Freeman, 2004), then-U.S. Secretary of Education Rod Paige said of the state of gender in education:

> It is clear that girls are taking education very seriously and that they have made tremendous strides. . . . The issue now is that boys seem to be falling behind. We need to spend some time researching the problem so that we can give boys the support to succeed academically. (quoted in U.S. Department of Education, 2004, ¶ 4)

Indeed, support for boys' issues includes actors at the very top of the administration. In his 2005 State of the Union Address, George W. Bush indicated his concern:

> Now we need to focus on giving young people, especially young men in our cities, better options than apathy, or gangs, or jail. Tonight I propose a three-year initiative to help organizations keep young people out of gangs, and show young men an ideal of manhood that respects women and rejects violence. (¶ 30)

Despite such support, it is not clear that the research Paige refers to is being or has been conducted or that the progress of Bush's antigang initiative, spearheaded by First Lady Laura Bush, has been anything more than marginal (Hillman & Trahan, 2006).

As these high-level politicians voice their concerns about boys' education, they are simultaneously weakening the policy infrastructure for women's and girls' issues (an instance of *predation* leading to *entropy,* in ecological terms). The Bush administration, for example, within two months of assuming office in 2001, closed the White House Office of Women's Initiatives and Outreach. Bush's Fiscal Year 2004 Federal Budget cut funding for implementation and support for the Women's Educational Equity Act, and it slashed the budget of the Violence Against Women Program. Within education, the Bush administration has twice commissioned "reviews" of Title IX, once to revisit the athletic rules that conservatives view as restrictive (Secretary of Education's Commission on Opportunity in Athletics, 2003) and a second time to end restrictions on single-sex programs.

Given these interventions by the administration, many feminists and their supporters justifiably feel great *pressure.* They feel that they now have less *agency* to resist boy-focused policy creation attempts. All things considered, the potential for (some may say, the threat of) *emergence* of large-scale boys' education policies is higher than ever.

The policy ecology metaphor, applied in this way, points to a number of actors, relationships, historical and cultural dynamics, structural constraints, and shifting processes that shape the directions taken by U.S. movements for boys' education policy.

More than the specificities of the case itself, such an analysis highlights what using the ecology metaphor might do for policy analysts.

Traditional or functional analyses would be less well equipped to uncover the full range of underpinnings for the shaping of a policy or, as in the case under discussion, the lack of official policy amid the profusion of de facto policy. Traditional policy analysis focuses on accomplished policy (often rightly). It also privileges inputs and outputs, looks primarily to the actors most in the public eye, and often makes invisible the historical, cultural, social, and mediated contexts that delimit or catalyze policy. A policy ecology metaphor, on the other hand, provides a framework for asking broader questions about the many contexts and influences swirling around a policy process. Who are the necessary and influential actors? What relationships exist among actors? Within what environments and structures do they all operate? What processes are they dealing with, reacting to, or creating?

Implications and Uses of the Policy Ecology Metaphor

What can a policy ecology metaphor do for analysts, beyond simply encompassing the multiple dynamics that surround an educational issue? What might analysts gain from using the metaphor? Perhaps the most important benefit, especially in a critical framework like mine, is that an ecology metaphor sheds light on strategy for advocates and activists. It forces one to think about tactics in policy processes in a new, multifocal way. It does so because the metaphor urges expansive thinking, an understanding of interrelationships, and a view of policy as having broad impact.

To strategize in a system that one conceptualizes in this way—to be more successful *because* one has such a perspective—means intervening in the policy process at many points rather than agitating at one particular stage of a circuit. As Banathy (1996) argued, policies are too often aimed at breaking a problem into manageable parts and fixing each part individually. However, "getting rid of what is not wanted does not give you what is desired" (p. 82); fixing things that go wrong at one stage of a policy, in other words, does not guarantee that the whole policy will be fixed. Conceptualizing policy as an interdependent ecology resists such fragmented strategy.

Analysts and advocates may realize several strategic benefits by using a policy ecology framework. First, they can use an ecology analysis to identify the actors responsible for making decisions and policy. They can use it to identify stakeholders and influential groups that must be resisted, allied with, answered, or accommodated. Second, they can use it to identify key arguments made by various actors and ways to respond effectively to those arguments. Third, such a framework can help uncover driving forces (key processes) for particular policy issues, along with structural constraints; it also demands attention to multiple levels (international, national, local, school, classroom) if analysts are to understand all of the complicating factors. Finally, it can be used to identify strategic mistakes and open opportunities.

For the strategist, the activist, or the policy maker, viewing the policy domain as an ecology reveals two seemingly contradictory principles. On the one hand, policy ecologies are in delicate, temporary balance (or are moving in that direction), and one change in one facet of the ecosystem can have consequences for the entire ecosystem. Lorenz's notion of the butterfly effect (e.g., 1993, Appendix 1), in which minuscule variances such as the flutter of a butterfly's wing may dramatically alter large-scale weather patterns, nicely illustrates this notion. Focused activism in policy can have dramatic effects if targeted at the right elements of the ecology.

On the other hand, almost paradoxically, it is difficult to make wholesale, directed changes in an ecosystem without intervention at many points. The redundancy principle discussed above accounts for this dynamic, because there exist multiple, overlapping roles and actors. Nearly any educational reform, then, involves acceptance and action by many actors at many levels.

To illustrate the paradox of needing to attend to both the small and the widespread changes in policy ecologies, consider market-based school reforms in England that have centered on testing, accountability, and information sharing through league tables. Even though these are relatively technical-managerial interventions, they have had numerous negative consequences for already disadvantaged groups, such as students of color and the working class, as demonstrated by Gillborn and Youdell (2001). At the same time, the conservative reforms that have dominated in education internationally since the early 1980s have succeeded because they intervene in *multiple* aspects of the education system, from textbooks (e.g., Apple, 1986, 1991, 2000; Cornbleth & Waugh, 1995) to testing and accountability systems (e.g., Apple, 1999, 2006; Arnot, David, & Weiner, 1999) and even relationships with the business community (e.g., M. L. Smith, 2004).

For the policy ecologist, success can come only by navigating the tense, precarious duality that requires one to intervene in multiple ways but with care for the ripple effects of every change made. An ecological view nevertheless seems to offer the best avenue for understanding in depth the specificities of place that strategic intervention demands.

For researchers and policy analysts, a policy ecology metaphor demands a broader understanding of the many facets of policy contexts. I do not consider the policy ecology metaphor primarily a step-by-step process, although scholars could, of course, examine the various characteristics and relationships of an ecology in a systematic way and could create maps much like Figure 1 to trace the flows of discourse, capital, influence, and so forth. More important, however, a policy ecology metaphor is a way of conceptualizing both policy *and* its analysis. Such a conceptualization forces researchers to look beyond politicians, government bureaucracies, and an undifferentiated notion of policy implementers—past the political spectacle that so often accompanies modern policy making (Edelman, 1988; M. L. Smith, 2004)—to view instead the processes taking place "backstage."

Moreover, a policy ecology framework may attract more diverse scholars to the ranks of policy analysts and thus more diverse worldviews. Indigenous knowledge systems, such as those of various North American Indian tribes and aboriginal Australians, are often more consonant with a holistic view of systems in nature. Given the complex and often deleterious effects of policy on these peoples, indigenous ecological perspectives may facilitate policy analysis and policy formation that is more socially just.

Conclusion

The metaphor of policies and their environments as constituting a policy ecology has the potential to expand the definitions of policy and the understanding of who is implicated in policy processes. It leads the analyst toward accounting for diverse actors, considering more complex relationships and interdependencies, exploring multiple levels of environments and structures, and recognizing the many complicated processes that create transformations within any policy's domain.

Perhaps most important, such a metaphor undergirds strategic interventions in the processes of educational policy that have been pointed out in previous post-structural and critical studies. Understanding complexities through a policy ecology metaphor creates, in other words, new progressive potentials and effective means for critiquing policies that serve the interests of only the few and for creating the kind of policy that makes a difference for educators and their students.

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APPENDIX
Elements of a Policy Ecology

Element	Definition	Example(s)
Actors	Persons and groups with varying power and roles (sometimes multiple roles) within the ecology.	Policy makers, professors, teachers, students, parents, media, nongovernmental organizations, etc.
Relationships	The social connections and behavioral interactions among actors in an ecology.	
Competition	Actors vie against one another for scarce resources and social power.	Conservative Christian groups fight against secular professional organizations for the right to determine science curriculum (e.g., Apple, 2006).
Cooperation	Actors explicitly work together to accomplish mutual goals.	Progressive and conservative groups work together to eliminate junk food in schools.
Predation	Actors wield social or physical power to eliminate other actors or take resources from them.	Conservative boys' advocates in Australia establish a discourse of boys as disadvantaged and girls as privileged; millions of dollars are funneled to boys' programs and policy is altered to focus on boys instead of girls (Weaver-Hightower, in press-b).
Symbiosis	Actors work interdependently for gain to all actors but without intention.	African American groups push for voucher programs for their children, and conservative groups who also push for vouchers prosper from their advocacy (Pedroni, 2007).
Environments and structures	The natural and constructed conditions, traditions, and rules within which actors and relationships exist.	
Boundaries	The limits within which actors work and policies apply.	In the Civil Rights Era, some attempts at desegregation in the U.S. South are foiled when states close all schools rather than integrate them; this is possible because schooling provision is bounded within the states.
Extant conditions	The natural and human sociocultural environments and dynamics in existence at the moment of analysis.	Weather, history, traditions, economy, existing policies, gender regimes, racial and class dynamics, population, etc.
Pressures	Forces toward change in the ecology.	Public universities face dramatic decreases in state funding, forcing them to focus more on self-funding.
Inputs	Resources available to actors.	Money, time, teaching positions, information, administrative support, technology, etc.
Consumption	The use and depletion of resources.	A university athletic department offers too many scholarships, so money is funneled away from graduate tuition remissions to compensate.
Niches and roles	Positions and specialized responsibilities within an ecology.	Community colleges provide much remedial coursework, relieving 4-year schools of this responsibility and ensuring their own survival.
Agency	Power and ability to act within and potentially change an ecology.	Parents of children with attention deficit disorder gain new power to demand accommodations for their children through so-called 504 Plans.
Adaptive decentralization	The lack of centralized control over the workings of an ecology.	U.S. states, until recently, developed divergent K–12 assessment systems because there was no centralized or federal control over education.
Processes	Dynamic natural or constructed changes in the relationships between actors and within environments.	
Emergence	The appearance of new ecologies when the resources and actors are available for their sustenance.	For-profit universities multiply and flourish as demands for more credentials have created more students.
Entropy	The breakdown or disordering of an ecology.	Schools for pregnant girls begin to disappear amid tight funding, lackluster results, and a reduction in the stigma associated with teen pregnancy.

(continued)

APPENDIX (continued)

Element	Definition	Example(s)
Adaptation	Change made by actors to align themselves with altered environments in an effort to move toward equilibrium.	Teachers adapt to No Child Left Behind pressures by teaching to the test, focusing on reading and writing to the exclusion of other subjects, etc.
Conversion	Dramatic change to the basic structures and dynamics in an ecology.	The unionization of teaching assistants changes how administrators and students negotiate salaries and benefits.
Fragmentation	The splitting of an ecology or group into two or more.	The U.S. Department of Health, Education and Welfare was split into two departments in 1979. The newly created Department of Education became a more influential actor in the policy ecology.
Succession	The destruction or removal of part or all of an ecology and its replacement by a different ecology.	The New Orleans public schools are destroyed by Hurricane Katrina and are largely replaced with charter schools and for-profit schools.
Conservation	Preservation or reduction in the use of resources in an attempt to maintain sustainable inputs.	Rural schools in the United States increasingly consolidate to save money and expand opportunities for students.
Anticipation	Prediction of, and action based on, the future needs of actors in the ecology.	Funding pressures push universities and colleges to stockpile sizeable, sometimes massive endowments to secure their financial futures.
Redundancy	Multiple, overlapping actors and organizations capable of performing necessary roles in an ecology.	Sex education was developed in schools partly as a means of teaching sexual hygiene and morality to children whose parents were thought to be incapable.