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The Vitality of Difference: Systems Theory, the Environment, and the Ghost of Parsons

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Social and natural scientists these days are sincerely trying to learn how to talk to each other. This is a good thing. For the last 25 years at least, calls have regularly gone out from many a lonely academic mountain top concerning the need for interdisciplinarity in a world that knows no boundaries. The doubt of the sixties generation, boomed by the devastation that war, nuclearism, and pollution wreaked on our modernist confidence, led to vigorous contestation of the guild system of scholarship, divided into its confines of disciplinary ritual and prestige. Today, we have moved past contestation into general acceptance of this critique, as evidenced by the steady increase in interdisciplinary graduate programs, interdisciplinary journals, and interdisciplinary professional societies across the globe. Who now would dare to speak against interdisciplinarity?

Nevertheless, we have made very little progress. The disciplines remain largely intact, and still rule our campuses. The great divide across the "two cultures" that C. P. Snow identified long ago remains a very deep gulf indeed. There are now a few monkey bridges across that gulf, but they are as yet shaky, hazardous, and little used.

One hope for something better than a monkey bridge has focused on the belief that the gulf is primarily one of language. If we could come up with a common theoretical vocabulary for the two cultures, then they might at long last become one culture. It is with such a hope that Warren offers his socioecological systems (SES) approach, blending Giddens's and Sewell's visions of structuration theory with the hierarchy theory of Allen and others. Not only does he offer this approach as a source of connection among scientists, but he also argues that such a language could have significant practical benefits for the management of environment and natural resources.

This is not an unworthy hope. Plus, the environment is a welcoming topic for such a theoretical lingua franca—if not the most welcoming of all topics—for both intellectual and institutional reasons. Intellectually, the environment seems inescapably interdisciplinary, drawing on all our scholarly resources to comprehend, as virtually everyone now seems to agree. Institutionally, the environment both was a latecomer to the guild system and happened to arrive on the academic scene just

as the clamor for interdisciplinarity was rising. Thus, it has been difficult for any one discipline to claim the environment, as well as difficult to establish the environment as a new and separate field in universities already overpopulated with departments and their constant little organizational squabbles.

Systems theory, moreover, has seemed to many a welcoming basis for a common theoretical language. Most of those who have worked on it—especially since the turn away from systems theory's origins in military planning and the kind of engineering approach that has come to be called ''hard systems'' thinking—have tried to craft its concepts and insights in encompassing terms that are beyond the possession of any one discipline. In this view, the whole point of systems thinking is to allow us to talk about the unbounded quality of the world, in a way that gets us past the blooming, buzzing confusion of pure holism. Consequently, many an effort at interdisciplinarity has picked up the growing dictionary of systems theory as a way to talk to those across the table.

But on closer inspection, many have also found the dictionary of systems theory not as clear and unifying as they hoped. This is not least because there are now many systems theories. There is the much criticized (but still widely used) ''hard systems'' approach. There is ''soft systems'' theory. There is ''complex systems'' theory—the approach that Warren has embraced. And there is even now a ''postmodern'' approach to systems theory. To put it another way, the lingua franca of systems theory has already broken up into distinct regional dialects, and perhaps even into separate languages.

In addition, it must be said, several of the social sciences are quite wary of systems theory, especially sociology and anthropology, still spooked by the ghosts of structural-functionalism and its effort to chart the ''social system.'' In sociology, the scariest ghost remains that of the redoubtable Talcott Parsons, with his infamously dull tomes and AGIL—adaptation/goal attainment/integration/latency—model of how society was structured to function as a system. Every graduate student of sociology who has made it through a theory class even half awake comes away knowing something of the litany of sins attributed to Parsons's approach, most especially its silence on power, its unhelpfulness with regard to the possibility of agency, and its functionalist fallacy of arguing that the parts are required to ensure the maintenance of the whole, leading to a bias against change, lest change lead to disarticulation and chaos.

In light of this pluralism, and of the concerns that sociologists and other social scientists have raised, it seems to me that a successful case to construct a lingua franca out of systems theory must contend with the following questions:

- Which systems theory?
- What about power and change?
- And, most fundamentally of all, why use the metaphor of ''systems'' at all?

Despite the worthiness of his goals, I argue that Warren has not adequately answered any of these questions.

Which Systems Theory?

Systems theory is, by now, surely not news. The metaphor of ''system'' emerged on the academic landscape in the 1940s, out of the ''operations research'' of the U.S. and British military in World War II (Richmond 2001). But of course, it is far older

than that, dating back to the ancient Greeks, who combined *syn*, meaning "connect," with *histanai*, meaning "to set up," in order to portray an "organized whole" (Onions 1955 [1933]). This sense of an organized whole still carries on in the word today, and in the theories that use the term—although increasingly with some significant caveats, as I'll come to. By now the metaphor is nearly everywhere in the academe, particularly in the natural sciences, in engineering, in the business schools, and in economics. Even sociologists still use it from time to time, most notably in the "world systems theory" of Wallerstein.

Systems theory made its first big impact in environmental discussions with the World3 computer model of Jorgen Randers, Donella Meadows, and Dennis Meadows, through their famous book *The Limits to Growth* and its Malthusian analysis of the environmental situation. Randers and company based their work on the systems theory of MIT engineer Jay Forrester, later professor at MIT's Sloan School of Mangement, who took the ideas about digital computing he developed for naval air defense in World War II and applied them to society. Not surprisingly, for all its emphasis on "system dynamics" and "feedback loops," systems theory at this time had a mechanical, linear, and orderly feel about it, much in keeping with the modernist sensibilities of the 1960 s and 1970 s, despite the growing doubts about our technological faith.

The doubts continued to grow, though, both about technology and about systems theory of the Forrester flavor—what Checkland labeled the "hard systems" approach, or what I think could also be characterized as the "modernist" systems approach. One of those doubts sprang from the observation that there was an inevitable selectivity in systems theory, as observers from a number of quarters noted: One had to decide *what* to model. For some problems, this decision seemed relatively clear, such as the mechanical issues of computer construction that engineers like Forrester had begun with. But most problems, said Checkland, were caught up in human politics and institutions, meaning there is considerable conflict over what the problem even is. So, for Checkland, the most important task of systems theory is to devise a process by which a diversity of perspectives can be brought together to define not the "problem," but what Checkland (1981) and Checkland and Scholes (1990) called the "problem situation." Checkland called his approach "soft systems methodology," and versions of it were relatively soon incorporated into environmental management work (particularly in the area of agricultural sustainability) like that of Conway and Barbier (1990) and Wilson and Morren (1990), because of its greater sensitivity to issues of human social institutions. Checkland's work is also a forerunner of the current interest in participatory research methods.

Meanwhile, doubts about modernist systems theory were also growing among physicists and ecologists, who found it too orderly and simplistic, and unable to account for surprise and change, other than saying that the model must have been wrong or incomplete. The charge that sociologists had earlier laid at the modernist pedestal of Parsonsian structural-functionalism concerning its static character was being laid at the pedestal of linear systems thinking and ideas like "ecological climax," led in ecology by Allen and Starr (1982), Kay (1991), and O'Neill et al. (1986), among others. Plus, there was rising concern about what might be termed the "boundary problem" in systems theory. If everything is connected to everything else, as we know must eventually be the case, then how can a model identify any element as a component or subsystem of a system—or indeed, how can any model that does not account for the whole universe be sufficient?

As an alternative, these scholars proposed various versions of "complex systems" theory or "complexity theory," perhaps the most popular version of which is the "hierarchy theory" of Allen and colleagues (Ahl and Allen 1996; Allen and Hoekstra 1992). Central to hierarchy theory is the idea that the world looks different depending on from where you look at it, leading to a stress on the organizational level of a particular systems analysis, as well as a stress on the scale of analysis, in order to account for the boundary problem. The result is a more fluid understanding of systems, while noting a capacity for self-organization within systems.

Warren draws much of his theoretical sustenance here, particularly the metaphor of systems being organized by "nested" scales and levels of analysis. Hierarchy theory doesn't sound all that social to the sociologist's ear, which is unsurprising given its disciplinary origins. The very word "hierarchy" grates for a sociologist, as it smacks of an endorsement of domination, whether intended or not. Plus there is the continuing doubt of sociologists toward systems theory in general, manifested in the continuing ill will toward Parsons. But approaches like hierarchy theory that embrace complexity perhaps present a new opportunity for systems thinking within sociology. Warren's move, then, is to try to merge—perhaps to domesticate—complex systems theory with the structuration theory of Giddens and Sewell, giving it, he hopes, a broader language for engaging the social.

Structuration theory is not a bad choice for Warren's project. There is something of an intuitive fit with the new systems theories and structuration theory, and a merging has been attempted before at least once that I am aware of (Woodgate and Redclift 1998), in that case between structuration theory and Norgaard's coevolutionary theory. Giddens's notion of every structure being both a constraint and an enablement is, like complexity theory, oriented toward a more fluid notion of order. And in both complexity theory and structuration theory, we have an approach that has clearly differentiated itself from the modernist confidences of the past, while by no means abandoning the modernist project. Giddens and his colleagues (Beck, Giddens, and Lash 1994) call this a "reflexive modernization" approach, a kind of "second modernization," what Beck (1995) terms the "modernization of modernization"—an enlightened modernization that gives more scope for debate and difference. The moniker could equally well apply to the sensibilities of complexity theory. It is thus an understandable match.

But has the ghost of Parsons thereby been exorcized from systems theory for the social sciences? I find it surprising that Warren does not address this issue. The name Parsons—the name sociologists are most apt to link with systems theory—does not enter his article or his bibliography. Perhaps this was a strategic choice on Warren's part, hoping to deny an old ghost a presence in the debate by simply ignoring it. But his choice of a structuration theory as one of the footings for the bridge he is trying to build is unlikely to give this ghost rest, for there are close affinities between the work of Giddens and Parsons, as I argue later.

Meanwhile, complex systems theory has moved on. Today, the current debate is focusing on the notion of "narrative" in systems theory—how every model of a system is inevitably partial, in both senses of the word. No single model can capture the incommensurability of the world; choice, purpose, intentionality, and perspective are inescapable, theorists like Allen are now arguing (Allen et al. 2001). Every model is "observer-dependent." In some ways, this is a return to the insights of Checkland, but in a much more forceful way that some (Allen et al. 2001; Kay et al. 1999) are

now calling "postnormal" or "postmodern" systems theory. Postmodern is something Warren's approach most definitely is not.

What About Power and Change?

Given the field's history, sociologists remain at a Missourian moment with regard to systems theory: show me, and show me in particular about power and change. Warren is not unaware of these issues, clearly. He hopes, I think, that structuration theory's famous motto of the "duality of structure" will allow both for an element of external control from the constraint side of the duality, and an element of agency (and thus change) from the enablement side. But there is a rather Parsonian and functionalist feel to this formulation, as the patterns of social life live in and through social agents—a static-ness to the formulation, even as it allows for considerably more agency than Parsons did. Somehow, it all seems to balance out in the end, an orderliness of constraint and enablement, occasionally disrupted by Giddens's main explanations of change: unintended consequences, the "double hermeneutic" (when social agents react to what social scientists say about them), and people's application of their "knowledgibility" about their situation. Still, there is no current here, no sweep, no movement in the way a Marx or a Weber, or even a Foucault, would have insisted on. A bit of social randomness here and there moves things along a bit, but otherwise structuration mainly tells us how things stay the same.

Warren states that the SES model provides an "engine" (a rather mechanistic metaphor), but the static-ness of his approach is evident in the illustration he provides of the SES, which has no movement or motion other than feedback into itself, despite his intent to offer a "process" and "dynamic" model. Moreover, although his intent is as well to integrate the micro and the macro, when we get to the application section his concern seems to be much more for "higher level social or ecological constraints" and how local resource managers don't pay these constraints much heed. He worries about the "instability" and "loss of predictability" that can occur when these constraints are not taken into account. Local resource managers, Warren argues, need to pay attention to "institutional as well as ecological forcing mechanisms at scales beyond their immediate management purview." He also states, in the same sentence, that they need to be aware of how local-level actions "either maintain (reproduce) or promote deinstitutionalization of larger scale social formations," bringing the micro level into the analysis. But to handle micro–macro integration in this way sounds to me a lot like structural-functionalism, or at least a very close cousin. The whole controls the parts, and the parts serve to produce the shape of the whole. Change is possible, but it results in instability and lack of predictability— alarming metaphors. Meanwhile, the origin of the change is unaccounted for.

This static aspect of Warren's SES model is of a piece with its relative inattention to issues of power. Most sociologists look to power as one of the central factors in social change, and Warren does not ignore it completely, as I have noted. But the topic of power barely appears—at least explicitly—until the applications section, where it comes across as something of an afterthought. Warren probably feels, as I suggested earlier, that the use of structuration theory implies a concern with power throughout. But structuration is not in itself a theory of power (although I believe it is commonly interpreted that way).

Let me explain this point by tracing a paradox of structuration theory with regard to power: If, for example, we are to understand power as, say, enablement

in social (and ecological) life, then the more structural constraint a social actor has, the more power that social actor has, for enablement is the flip side of constraint, or so structuration theory tells us. Those actors with the least constraint would be those with the least enablement; those with the least amount of structural impingement on their lives would be the ones with the least power, if it is structure that enables us. This is obviously completely the reverse of what we expect a theory of power to account for. Plus there is here as well a static quality to the account, for while we learn from structuration that constraint and enablement "recursively" create each other, we do not learn how that endless (and functionalist) loop comes to have the character it has in specific contexts. Nor are we given any means for judging social inequality. No, a theory of social power has to come from elsewhere.

This is a critique of structuration theory itself, and not Warren. But the problem remains. "Hierarchy theory" is no help here either. The use of "hierarchy" in this context refers to organizational levels and analytic scale, and it is supposed to mean that all scales and levels equally constitute the others (in good functionalist style), or at least potentially. It is not meant as a means of judging social inequality, despite the name, and Warren does not use it for that purpose. This is part of the reason why, as Warren notes, some complex systems theorists prefer the neologism "panarchy."

In sum, Warren's choice of structuration theory as his route to the social side of the SES model, out of the many sociological approaches on offer, speaks to the functionalist presuppositions that guide the model. And it is unlikely to satisfy sociologists from Missouri.

Why the Metaphor of Systems?

Warren calls his approach, in keeping with Giddens, an "interpretive model" rather then a "falsifiable hypothetico-deductive model." I think what he means by this is two things: that he wants to offer a conceptual scheme for orienting our minds to the socioecological context, and that his model is open to qualitative and cultural approaches. He wants to avoid the narrow scientism of modernist academia, in keeping with the "reflexive" or "second" modernization goal of SES.

But there is reason to introduce into the discussion the line of questioning often associated with the term "postmodernism," if by no other account than that some prominent systems theorists are already doing so. I want to take the discussion beyond the narrower meaning of "interpretive" that Warren has in mind, and come to the issue of Warren's own narrative.

Central to that narrative is a theme of unity. Warren wants to unite the social and the ecological, the social sciences and natural sciences, to cross the "deep schemas" that constitute the gulf between them. He wants "to analyze socioecological systems as a unity." He seeks the unity of peace between the disciplines, of appreciation of the boundless holism of life, and of finding a single theory that applies to everything.

This search for a unified field theory of everything seems to me the most breathtaking, and misguided, aspect of the ambitions of systems theory. As Aristotle (1987, 83) noted long ago with regard to Plato's theory of the "good," under such a view everything "will be the same, and the thesis under discussion will no longer be that all things are one, but that they are nothing at all." And indeed, SES and other encompassing efforts at systems theory amount to just such a search for the "good," for advocates never question whether we would want a theory of everything. It is

taken as self-evident that having such a theory would be a good thing. But were such a quaquaversal theory achieved, the human capacity for control would be, in my view, deeply troubling. One theory to rule them all....

Fortunately, it is not achievable. One of the most important things to recognize about the world, it seems to me, is that a great deal of it is not very systemlike at all. Things, actions, ideas, and the academic disciplines that study them do not all fit together. They do not all balance out in the end. Rather, the world is rife with conflict, confusion, disconnection, and discombobulation. Everywhere around us we see incompatibility and incommensurability. This is not to say that the world presents to us no "systemlike" qualities—no features that we can credibly imagine in this way. We don't see only incompatibility and incommensurability in the world, of course. But we sure see a hefty measure of them in most things that we pause to inspect with care. There is no one theory that can rule all this.

Systems theories of the reflexive modernization and postmodern varieties have acknowledged to some extent the ragged edges and disjunctures in our social and ecological lives, and they have made some attempt to come to terms with this acknowledgment with concepts like "patchiness" and "lumpiness"—but not nearly enough, in my judgment. This is in part because the system metaphor, with its persistent sense of an organized whole, lures us into thinking there could be one theory, and that we would want one even if we confess it not possible to have. So we look for one, gaining satisfaction in the organized connections we find, and gaining frustration and a sense of failure in the ones we don't find.

There is no necessary failure in finding that the world is less seamless, less articulated, and, yes, less unified then we thought or hoped. Quite the reverse: There is hope. For herein lie possibility, creativity, vitality, change, and meaning. It is from what Mikhail Bakhtin (1981) called the "unfinalizability" of dialogue across difference that the aliveness of life, social and ecological, springs.

My case is not for chaos and disorder, for dropping the "p" from "panarchy." There are indeed connections in the social, in the ecological, and between them as well. Lots of them. We know that now. And there is cause for hope here too, for without a degree of sameness and connection we would fall into that blooming, buzzing confusion from the other direction. Moreover, without a degree of connection there would be no way to talk across the disciplines, or across any other point of difference. And yes, we do want the disciplines to talk to each other.

But we don't want them to agree, at least not completely. We don't want them to use all the same words in all the same ways. Because then there would be nothing to talk about. That, however, does not appear to be a situation we are in danger of reaching any time soon.

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