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Metaphors and Social Science

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The social sciences have a considerable history of attempts to apply models and theories from the physical sciences. All such attempts have failed, primarily because social scientists have commonly not distinguished between applications and possibly useful metaphors.

Attempts to apply non-linear mathematics to social concerns will similarly fail. There are now no non-trivial applications, and there are unlikely ever to be.

But the phenomenon of reifying models and theories from elsewhere has long standing status in the social sciences, and DDNS can play an important role in monitoring those attempts.

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While excellent references to chaos are now commonplaces in the natural sciences, references to it in the social science literature are often problematic, making DDNS particularly welcome. My intent here is to explore why that has been the case and then to suggest how that leads to a productive extension of the role of DDNS.

A. THE BAD NEWS

Since their inception well over a century ago, the social sciences have been driven by metaphors. That is to be expected, and so long as we have not lost sight of the fact that we *have* been exploring metaphors, they have sometimes led to productive insights. It certainly does no harm to suppose for a time that children's minds might be like buckets or trees, or that they may learn the way rats learn to run a T-maze. The problems have arisen, and continue to rise, when social scientists have not distinguished between metaphors and applications.

There are many more specific exemplars, but it is best to begin with a general example of the consequences of failing to make that distinction. The idea is much older, but early in the nineteenth century Laplace[1] laid out what he saw to be the implications of Newtonian mechanics; that the universe is a completely deterministic place – everything in the past and in the future is linked in a long network of causes and effects. Our instruments are blunt and we are frail, but for Laplace the immediate task of all science is to understand parts of the chain and the long aim is to aspire to a 'theory of everything'.

Given the successes of research devolving from that premise in the physical sciences, it was scarcely surprising that it would spill over into the social sciences, all the way to the present. That, it has

been supposed, is what science is all about. Some contempory analysts have demurred (see Morgenthau [2] and Schwab [3]) but, particular when it is seen as an application of 'the scientific method', not just a metaphor, it continues to drive research and analysis.

We continue to use tools like linear regression analysis to attempt to use adolescent qualities and behavior to account for adult criminal lifestyles, to discover the effects of administrative style on institutional well-being, and on and on. Literally tens of thousands of graduate theses and professorial works have been published, now mainly to commend the authors for degrees, tenure, and promotions.

As long ago as when Jack Stevens [4] wrote, and more commonly recently, analysts have been pointing out that most social science research has contributed little more than truisms to practice. See, for example, Jackson [5], Cronbach [6], Schwab [7] and Shapiro [8].

The root of the problem, Schwab [7] pointed out, has been our failure to distinguish between applications and metaphors. For whatever reasons, the Laplacian metaphor has failed us. Since it began to become clear that such is the case, social scientists have gone off in three directions.

Some (see Postman [9]), have given up altogether on social science as science. It is, they say, not science at all. It is a collection of possibly instructive narratives. As he says in the above citation:

> The purpose of social research is to rediscover the truths of social life; to comment on and criticize the moral behavior of people; and, finally, to put forward metaphors, images, and ideas that can help people live with some measure of understanding and dignity. ... And so we are obliged, in the interest of a humane survival, to tell tales about what sort of paradise may be gained, and what sort lost. We will not have been the first to tell such tales. But unless our stories ring true, we may be the last.

This case is stronger than it may first seem to be. Since the beginning, social scientists have agreed that while we may be measuring the wrong things or measuring them in the wrong way, at least we are *measuring* and in time may get it right.

And that, in the main, is not true. To mean very much, measurements must be *additive* and *compensatory*. That is, if we have 2, 3, and 5 kg bags of potatoes, it is reasonable to add those numbers and assert that we have 10 kg of potatoes. Further, the 5 kg bag may be replaced by 1 and 4 kg bags. All measurements of all attributes from wherever in technology, engineering, and science have those two qualities.

It is possible that a score of 7/10 on a spelling test may have those qualities. As a measure of performance it may not matter which words were spelled incorrectly. But even that supposition is arguable. By the time we get to 'intelligence', 'social class' and the like there can be no argument. The numbers we attach to such constructs are not measurements. They are metaphors, and possibly useful ones, but we ought not to be surprised to find that they generally do not correlate very well with anything. It is at its foundations, then, that the status of social 'science' can be questioned.

The second group, commonly calling themselves post-modernists, began with literary criticism but have diffused into science where they decry 'the hegemony of mainstream epistomologies' and call for but rarely propose alternative ways of knowing. One of the best dialectics of the genre is to be found in Thomas [10]. The post-modernists need not concern us further here.

The majority of social scientists have sought other metaphors. It is obvious that the simple ones, such as that social institutions should be run like parliaments, armies, or, just now, businesses, *are* metaphors. But more cogent for the present purpose, scarcely has any scientific innovation come to general attention than a metaphor has made its way into the social sciences, often as a putative application.

There are many examples of the latter phenomenon, but quantum theory serves well to illustrate it. In 1963 Maccia and Reynolds [11] published "An Educational Theory Model: Quantum Theory" in which they first sketch, rather well actually, the nature of quantum theory – complete with Planck, Schroedinger equations, and Heisenberg. They then

attempt to apply it to teaching and student learning and conclude "... it may be expected that student's (sic) behavior will appear only at certain values. All learning will be stepwise... and not all values of teaching will produce learning. Teaching will have to assume certain values. Furthermore, either a constant of learning or of teaching may be determinable."

In retrospect, as Jacobson *et al.* [12] pointed out at the time, the notion seems rather improbable. No one, so far as I know, has seriously pursued that suggestion. But attempts to 'apply' quantum theory in the social sciences have continued. It has been supposed that educational change might be understood as an 'application' of quantum theory and it has been continually invoked as a fuzzy explanation of free will.

Catastrophe theory, whatever its natural-science implications, has been similarly invoked to 'explain' everything from prison riots to animal behavior. In fact, the notion that the behavior of some systems cannot be modelled by functions because it may depend on the system's history as much as current parameters seems to have promise, as a metaphor. But beyond the first flurry there are now very few purported 'applications'.

It is now chaos theory's turn. For readers of DDNS it is not necessary to document its considerable impact in the natural sciences. They may be less aware of the degree to which 'applications' of chaos theory are now cited as explanations of social phenomena.

And we are back to Schwab's admonishment. Models from elsewhere may (or may not) be useful as metaphors and we can possibly benefit from exploring them. Gould [13], for example, without using the phrase, uses the qualities of chaotic systems as an apt metaphor in his analysis of the evolution of life. But they are metaphors, not laws to be applied.

As has been the case with other 'applications', there are no current applications of chaos theory in the social sciences and there is no prospect that there ever will be. At best, it may be a useful metaphor. I cheerfully admit to having contributed to that discourse [14].

Social scientists are not to be blamed overly for having confused applications and metaphors. Such is probably to be expected in syncretic disciplines in the outer provinces. But more should be expected of those who are located closer to the natural sciences. They may not be overly familiar with the history or current state of the social sciences, but they should at least be concerned about wild extrapolations of notions that they are familiar with. As I will suggest below, that is why DDNS can play an important role.

In summary of the bad news, then, I am not sanguine concerning applications of chaos theory (or any other theory from the physical sciences) in the social sciences. If we expect chaos theory to somehow explain phenomena in the social sciences, about the only outcome that we can foresee with any confidence is that before long we can expect to see the queue of social scientists waiting for the next metaphor. I cringe when I think of what the social science literature will look like immediately following physicists' first publication of a long-awaited 'theory of everything'.

B. THE GOOD NEWS

But there is something with much greater potential waiting to be done; to take Husserl's advice and turn to the things themselves.

The social science phenomenon of reifying metaphors from elsewhere has long-term status. The social sciences *have* been driven by those metaphors. Many millions of dollars and person-hours have been spent on them.

But so far as I know, analyses of that obvious phenomenon are not now a consistent theme in any journal. It does not matter much that chaos theory is unlikely to find non-trivial applications in the social sciences or in practice. What matters is that folks think it might, and will likely expend considerable resources on the attempt. Some journal, in a series of analytic articles, ought to monitor those attempts.

Why DDNS rather than some social science journal? For the reason implicit above. No social

science journal has the readership to understand or weigh such analyses. In them, the bulk of commentary on chaos is apt to remain as diffuse as it currently is.

Consider, as just one example, the distinction between non-predictability and randomness. The editors, authors, and readers of DDNS are not likely to confuse the two. But they might (or might not) be mildly astonished to find them confused in some current social science publications, followed on occasion by some anguish over what that does to determinism, presumably of the Laplacian variety. I, and I trust others, would welcome a scholarly analysis of, say, "Randomness and non-predictability in the social science literature".

In monitoring the ways in which metaphors of non-linear mathematical systems are interpreted and 'applied' in the social sciences, DDNS could become an authoritative source for both clarifications and recommending further initiatives. I do not know of any other cadre of authors and readers who could fill that role.

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