methodology by reflecting on his research experience on climate change, drought and famine through a constructivist lens (García 2006). As far as I know, cybernetics and radical constructivism have not made much progress in designing this kind of proposal (although Hugo Alrøe and Egon Noe 2014 provide a good discussion that, in many aspects, is in line with García's considerations). Perhaps the lack of greater integration with empirical social research presents an obstacle. I think Umpleby's remarks in §§65–69 suggest a similar diagnosis. I can only hypothesize as to what extent such lack of integration is due to an unclear stance on society's "reality status," and subsequently, its effective conditioning on knowledge (Glasersfeld 2008; Müller 2008). In any case, García's work could be a fine case for observing how a constructivist perspective that acknowledges social forces and social structures can indeed make a contribution on this matter.

Gastón Becerra is an assistant professor at the Universidad de Buenos Aires. His research focuses on the emergence of "complexity" as an object of study for the social sciences and the constructivists traditions, with special attention to Rolando García's and Niklas Luhmann's ouvres.

Received: 7 June 2016
Accepted: 11 June 2016

Shed the Name to find Second-Order Success: Renaming Second-Order Cybernetics to Rescue its Essence

Michael R. Lissack
Institute for the Study of Coherence and Emergence, USA
lissack/at/isce.edu

> Upshot • Buried in the jargon of constructivism and cybernetics lies the essence of what second-order cybernetics can do for its practitioners. The labels and names get in the way; to move forward we must refocus on that essence – which is to ask always how context matters.

« 1 » Stuart Umpleby's target article highlights the intellectual progress of second-order cybernetics and its related branch of constructivism while at the same time making note of (and slightly bemoaning) its lack of implementation in both contemporary academic thought and practitioner practice. His hopeful expressions of the paths second-order cybernetics might take contrast with the field's lack of progress for the past two decades or more. In this commentary, I will rephrase Umpleby's proposed pathways by making explicit the main obstacle to their implementation: the very words, labels, history, and jargon that cyberneticians use to define their field and to encourage the uptake of its perspective by others.

« 2 » The reader should take careful note of an important irony here. In my role as the President of the American Society for Cybernetics I am tasked with preserving, evangelizing, and promulgating the essences of the field. To do this successfully, I believe that we need to recognize the context in which the very label "cybernetics" functions. The word has shifted in its meaning. The two-syllable conjunction "cyber" is now associated with computers and computation. While the old meaning of "steering" remains in the dictionary, it is lost on those who practitioners in the field need to reach. If we are to further cybernetics, and especially second-order cybernetics, as a field of intellectual inquiry, I believe we as a community need to accept that we have lost the battle of "the word." What matters in successful communication is how the listener receives the signals being transmitted and then converts those signals into personal meaning. Our insistence on making use of the 1950s and 1960s meaning of words such as "cybernetics" is getting in our way. Our desired listeners struggle to grasp our intended meaning. To "save" cybernetics so that it may live and prosper, I believe that its very name needs to be relegated to "historic label" and that we, as a community, need to find new ways to express our essential thoughts.

« 3 » It is on one of those essences that I will focus herein – the role of always asking about how context matters. Context here must be viewed in its broadest sense. Not just the material, social, and physiological opportunities, boundaries, and constraints that may serve to describe a given situation, but also the intellectual, semiotic, and lexical triggers that affect how any given participant or observer mentally processes that situation. As Umpleby quotes Thomas Kuhn: different participants/observers

> "see different things when they look from the same point in the same direction. […] Both are looking at the world, and what they look at has not changed. But in some areas they see different things, and they see them in different relations one to the other." (§4)

« 4 » In response to the Kuhn quote, second-order cybernetics and constructivism would also add that indeed what they look at has changed. Each participant and observer has their own set of mental constructs, and they can only "see" what they possess the constructs for. In §7, Umpleby notes:

> "Since people have different experiences – language, home life, culture, religion, academic training, and job experiences – each person's 'reality' is in some respects unique, though our knowledge of the physical and social world has many common features."

As Kuhn (1970: 48) put it: "You don't see something until you have the right metaphor [model] to let you perceive it." And as Daniel Kahneman (2011: 87) elaborates: "We often fail to allow for the possibility that

evidence that should be critical to our judgment is missing. What we see is all there is."

« 5 » Each participant and observer is thus perceiving, dealing with, processing, reacting to, and enacting their own "private" world. As Karl Weick claims, when people "enact" the environment,

> "they construct, rearrange, single out, and demolish many 'objective' features of their surroundings. They unrandomize variables, insert vestiges of orderliness, and literally create their own constraints" (Weick 1995: 30f).

In other words, they attempt to reduce the "world" to their "model" and labels. In so doing, they are making personal choices.

« 6 » Cyberneticians and constructivists have insight into the boundaries and constraints imposed by each individual's frame of thought. But, all too often, both cyberneticians and constructivists fail to recognize the imprisonment of their own personal frames of thought. The centrality of those personal frames was, of course, underscored by Ernst von Glasersfeld's "substitution of 'viability' or 'functional fit' for the notions of Truth and objective representation of an experiencer-independent reality" (Glasersfeld 2001: 31). Somehow, members of our community all too often fail to reflect on the idea that it is they who are drawing the frames and thus determining viability. "Fit" is recognized as a function of context. But, "fit" is also a function of personal choices. All of the factors that contribute to personal choice must be included in any definition of context. What we easily attribute to others is quite often hard to see in oneself – including, in this case, the role of personal choices.

« 7 » Both cyberneticians and constructivists forget the lessons of Hans Vaihinger's (1924) *Philosophy of "As If."* They seldom discuss the power of "enabling constraints" (Juarrero 1999). They overlook the criticality of Robert Rosen's (1985) models. They confuse how to apply the dictum "make everything as simple as possible, but not simpler" (which is almost always incorrectly attributed to Einstein) with von Foerster's imperative "act always so as to increase the number of choices" (Foerster 2003d: 227). And when discussing differences in mindsets with realists, they all too often forget Richard Rorty's dictum: "Knowledge is not a matter of getting reality right … but rather a matter of acquiring habits of action for coping with reality" (Rorty 1991: 1). Coping means finding meaning where one can by making choices.

« 8 » One of the tenets constructivism shares with several other approaches such as semiotics is that meaning is not embedded in language as if that language was merely a look-up table. Collectively, in everyday life, words and phrases often emerge from concrete situations in which participants jointly work out ways of describing what is going on. New terms, symbols, or images are situated; they acquire meaning through collective use in real situations. They are the product of a never-ending web and network of intersecting personal choices. Those choices get simplified so that the situation can be indeed reacted to and moved on from. All too often the choices made will fail to reflect their own nuanced environment and instead demand coherence with a simpler exogenous model. "We need models to explain what we see and to predict what will occur. We use models for envisioning the future and influencing it" (Derman 2011: 43). Sometimes this approach works. Oft times it fails. But note – both success and failure are rather clear cut when they occur.

« 9 » Following the observations of such success and failure come the attempts made to explain the results. It is here where second-order cybernetics and constructivism can have their greatest impact. Umpleby notes: "Under the old regime of the traditional scientific method, a societal problem was solved once this problem was successfully modelled or explained" (§51). But in today's society, a solution is not accepted without practical application. The "authority" of science conducted per the "scientific method" has eroded. Practical applications demand context. They can only be explained in light of the full context as I defined it above.

« 10 » Public acceptance of solutions is now dependent upon the public's willingness to accept restricted definitions of context such that the problem appears to be solved in that restricted context. Mere modelling or theoretical explanation is insufficient. In the absence of a defined context where a practical solution is demonstrable, problems are not "solved" – regardless of the elegance of a model or an "explanation." The public has, in effect, chosen to disregard "science" as the source of authoritative solutions.

« 11 » This choice stems naturally from our public tendency to accept a narrowing of the information we consider. "We take up only those actions and solutions that have an immediate effect on the situation, and always as they have been framed for us" (Piattelli-Palmarini 1996: 58). The frames used to view the problem are usually provided by others (be they politicians, the media, or "opinion") and they are usually missing information. "We, therefore, fail to note important items in plain sight, while we misread other facts by forcing them into preset mental channels, even when we retain a buried memory of actual events" (Gould 2010: 223). More critically, we all too often fail to realize that only "true models" in the Rosen (1985) sense allow for interventions to be "rehearsed." We instead allow others to frame mere descriptions for us as if they were models – and then are surprised when the anticipated affects of interventions go awry.

« 12 » What we choose to see will affect what we then pay attention to, which then affects the processes we call upon to make sense out of those attended to items. As Deborah Lupton points out, we then need to "clean up" the attended to data and its resulting story – removing the anomalies and ambiguities, and leaving behind a "simple story."

> "All cultures have ways of dealing with these anomalies and ambiguities. One way to deal with ambiguity is to classify a phenomenon into one category only and maintain it within the category, thus reducing the potential for uncertainty. Another method of dealing with anomaly is to physically control it, removing it. A third way is to avoid anomalous things by strengthening and affirming the classification system that renders them anomalous. Alternatively, anomalous events or things may be labeled dangerous." (Lupton 2013: 62)

Simple stories are usually not "true models" (a la Rosen) but are mere descriptions. But we use them as if they were models – models devoid of nuance, ambiguity, and context.

« 13 » When this succeeds, it is as Stephen Hawking and Leonard Mlodinow

describe it, "as-if" our simple story was the very reality we need to deal with.

> "The only meaningful thing is the usefulness of the model […] When such a model is successful at explaining events, we tend to attribute to it, and to the elements and concepts that constitute it, the quality of reality or absolute truth." (Hawking & Mlodinow 2010: 7)

Empowered by such success, we overlook its context-dependence. But our very definition of success has been intimately tied to the boundaries and constraints (cf. Juarrero 1999) that we imposed so as to frame the situation. In other words, our choices about context help to determine the success or failures of our models.

« 14 » We must remember the lessons from Vaihinger: "The object of the world of ideas as a whole is not the portrayal of reality – this would be an utterly impossible task – but rather to provide us with an instrument for finding our way about more easily in this world" (Vaihinger 1924: 15). and of Rorty. Our simple story is the result of choices we each make and have made. We make those choices to "make sense" out of a situation, to help us in our way-finding and in our coping. We always have the option of making different choices. But, the reality with which we deal will be the one we choose to deal with.

« 15 » This is the realm of "pragmatic constructivism" (Lissack & Graber 2014). The "pragmatic" here refers to the process of how we go about explaining a situation to someone else and the process of how we reach an understanding of that situation ourselves. When simple perceptions are inadequate, the need for tools that enable better access to the "what, who, and how much" that one needs to know in order to act becomes painfully obvious. The pragmatic constructivist is happy to accept the scientific realists' models as a base that must then be modified to account for boundaries, constraints, and the manifold possibilities inherent in the interactions of large numbers of autonomous and semi-autonomous agents. Such modifications are rooted in the observer/actor's understanding of the situation at hand – an understanding that itself can be molded by the interactions it observes and participates in. Explaining is the ability to relate a narrative to the questioner, which, at a minimum, allows a "fit" between the question asked and the "attended to" context and, in depth in the form of acquired understanding, allows the explainee to apply such narrative to new contexts and new questions.

« 16 » When we are explicit that we are choosing the realities we deal with, the problems we recognize as problems, and the boundaries and constraints that enable solutions, we are not only accepting some form of constructivism, but we are also accepting that we each have a sense of responsibility regarding such choices. Cybernetics has served to produce great insight into how we might manage these responsibilities, including:

- the role of the observer (von Foerster 2003d),
- the law of requisite variety (Ashby 1958),
- the importance of the observer in cognition (Maturana & Varela 1980),
- the use of Black Boxes (Glanville 1982),
- the idea that all action is in some ways a conversation (Pask 1975a),
- the importance of recognizing that "true models" (in the Robert Rosen sense, cf. Lissack 2016) differ from descriptive representations,
- the importance of narratives (Clarke 2014).

These insights can be reduced to a fundamental essence: it is critical to ask and explore how context in its fullest meaning matters. Second-order cybernetics is at essence the science of exploring how context matters.

« 17 » Exploring how context matters is a second-order concept. It is the essence of everything written above. Indeed, it may be the essence of everything in this special issue of *Constructivist Foundations*. What is important is that "exploring how context matters" is not jargon, is not domain or intellectual foundation restricted language, is not hard to grasp. Exploring how context matters is a question that can be applied to every scientific exploration, every strategic business decision, every social issue, and nearly every personal choice. If we can focus our second-order cybernetics efforts on getting others to "explore how context matters," we can re-introduce a ubiquity to the cybernetic/constructivist endeavour.

« 18 » Umpleby (§82 and §84) poses a challenge to the second-order cybernetics community: find relevance or risk death. His list of issues where a second-order cybernetics approach may yield valued results is both lengthy and practicable. But Umpleby (like the other authors in this issue) has minimized our actual dilemma: if we continue to use jargon to which others cannot relate, we fail.

« 19 » Many other intellectual communities are doing work that falls within the domains of second-order cybernetics and what I prefer to call "pragmatic constructivism." We can bring members of these communities "into the fold" if we begin to use language that gives them meaning. Together we can co-construct a new science of context. Exploring how context matters is just a beginning.

Michael Lissack is the Executive Director of the Institute for the Study of Coherence and Emergence, President of the American Society for Cybernetics, and Professor of Design and Innovation at Tongji University. His academic work is accessible at http://lissack.com and at http://remedy101.com

Received: 28 May 2016
Accepted: 31 May 2016

Beware False Dichotomies

Peter Cariani
Boston University, USA • cariani/at/bu.edu

> Upshot • While I agree with most of the thrust of second-order cybernetics, I find the dichotomy of first- vs. second-order cybernetics conceptually and historically problematic because it implicitly conflates the cybernetics of nonhuman systems with realist conceptions of observer-free science. The dichotomy may be divisive and unhealthy for cybernetics by driving natural scientists and engineers out of the movement, thereby undermining the universality of its principles.

« 1 » I am in general agreement with Stuart Umpleby's thoughtful historical and conceptual review of second-order cybernetics, and do agree with him that widespread adoption of the epistemological stances of second-order cybernetics would constitute a fundamental revolution in how