

Review of Rafael Núñez and Walter J. Freeman (eds.), *Reclaiming Cognition: The primacy of action, intention and emotion*, Bowling Green, OH: Imprint Academic, 2000, xxix + 284 pages, ISBN 0 907845 06 1. \$24.95 paperback. (Originally Published as *Journal of Consciousness Studies*, 6, 11-12, 1999.)

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When cognitive scientist Rafael Núñez and neuroscientist Walter Freeman decided to name their recent collection *Reclaiming Cognition*, they were quite clearly inviting a question: From whom does cognition need to be reclaimed? The answer to this implied question will be unsurprising to those who have followed recent debates in cognitive science. Cognition, Núñez and Freeman suggest, needs to be reclaimed from computational cognitive scientists, who claim thought is computation and who have been claiming for years that theirs is the only game in town.

The purpose of this collection to show that there are other games in town. The contributions are mostly from the outskirts of cognitive science, anti-computationalist radicals looking to pick a fight. Computational cognitive scientists raised on the milk of Chomsky and Fodor will find these essays frustrating for many reasons, among which are the following.

- Computational cognitive scientists are mocked as “technocrats and analysts”.
- Computationalist research is not taken especially seriously, and is criticized from a feminist perspective.
- Everything worthwhile is “embodied” or “situated” or “embedded”, and computational cognitive science is not “embodied” or “situated” or “embedded”.
- Along with the usual anti-computationalist suspects (Gibson, dynamical systems theory, Heidegger and Husserl), Freud, Marx and Irigaray are favorably discussed.

Despite these rhetorical excesses, even an unfortunate of the word ‘*linguaging*’, this collection has a lot going for it, and is deserving of a wide readership. Indeed, I will suggest that this is a book that the computational cognitive scientists especially really should read.

The supposed problem with computationalism, as anyone following current debates will have heard, is in its failure to address embodiment. The essay by Núñez describes three deepening levels of embodiment to which a theory of cognition might be committed. First there is *trivial embodiment*, which is simply the claim that thinking requires a brain. Everyone, even computationalists, believes this nowadays. The second level of commitment is to *material embodiment*. Commitment to material embodiment is commitment to trivial embodiments plus two more claims. First, cognition is decentralized. Second, cognition is constrained by the fact that it must be performed by an animal in real-time, with a brain like ours, in a body like ours, in a complex environment. In research on material embodiment, the focus is typically on low-level, not paradigmatically cognitive tasks such as motor control or feature detection. Finally, there is what Núñez calls *full embodiment*, which is the claim that *all* of our abilities are

embodied in sense 2. That is, concepts, creativity, poetry, and the like also cannot be understood other than in terms of brains, bodies, and real-time actions in complex environments. Indeed, the thought is that this embodiment is the raw material for all of our “higher-level” abilities.

Thus the problem with computational cognitive science from the point of view of the authors of the essays here is that computationalists are typically committed to just trivial embodiment, when cognition itself is fully embodied. Indeed, even the most computationalist-friendly thing here, the chapter by Andy **Clark**, adopts a commitment to full embodiment. Clark calls for a reconciliation of computationalism and fully embodied cognitive science. He suggests that we can take embodiment seriously, and still hold on the idea that cognition is computation by realizing that all mental representations, even those on which complicated computations are performed, are action-oriented. Clark is of course rarely considered a friend of the good old fashioned computational cognitive science, but in this collection, he seems stodgy, a reformer among revolutionaries. Most authors in the collection want no reconciliation, and argue that computationalism must be overthrown once and for all.

So, according to the contributors to this collection, cognition is to be reclaimed by practitioners of a non-computationalist, fully embodied cognitive science. But apart from the typically mocking rejection of computationalism and the commitment to full embodiment, is there anything like a unified story lurking in here? That is, is there one other game in town with sufficient explanatory power to be a competitor to computationalism? This collection is a mixed bag, but if you’re selective, you can cobble together such a story. Doing so, however, requires ignoring several contributions, some of them very good, concerning topics such as logic (**Longo**), quantum mechanics(**Gomatam**), phenomenology (**Goodwin, Sheets-Johnstone**), and feminism (**Rose**). This is not intended to disparage these essays, which include some of my favorites of the collection, especially Hillary **Rose’s** insightful, if ultimately self-contradictory, feminist critique of the current obsessions over consciousness.

What follows is an attempt at cobbling together such a unified story, which I will call ‘FEC’ for ‘fully embodied cognition’. Start with the standard dynamicist view (see the essays collected in Port and van Gelder 1995) that the brain, body, and environment are complex dynamical systems that are so tightly coupled as to be inexplicable as separate entities. Understanding the mind, the task of cognitive science or any scientific psychology, just is the understanding the interactions of these dynamic systems (**Cisek, Iverson & Thelen, Turvey & Shaw, Shaw & Turvey; Hardcastle**, echoing Griffiths 1997, suggests that emotions should also be understood dynamically, at least developmentally). The activity of the brain, an important part of this collection, is also to be understood as a dynamical system, to be explained using the mathematical tools of dynamical systems theory (**Freeman, Nicolis & Tsuda, Cisek**). Its main task is to act as the controller for the body in the environment (**Cisek**).

This coupling (brain-body-world) determines the content of many or most of our perceptions and thoughts. The most basic cases of perception are action-oriented, and the percepts are affordances (Gibson 1979) or opportunities for activity. Furthermore, much of our action is what Edward Reed (1996) called exploratory action, action designed to facilitate more felicitous perception (**Cisek, Clark, Turvey & Shaw, Shaw**

& Turvey). There is, according to this view, a very tight coupling between perception and action: some? most?) perception is action-oriented and (some? most?) action is perception-oriented.

Of course, not all of human thought is action-oriented. To explain paradigmatically cognitive activities like planning and doing math, activities in which we are in one way or another decoupled from the environment, FEC invokes concepts. First, because we are dealing with a story that focuses on the primacy of embodied action, concepts will be action- and body-based (**Núñez**) in a way that is familiar to readers of Lakoff and Johnson (1980, 1999). More importantly and less familiarly, the job of concepts, according to this picture, is to create and enforce an artificial separation of mind and world, to hold the world at arm's length briefly, imperfectly, in order to think about it. (**Skarda, Rosch**)

FEC is, I think, a very compelling story. Perhaps it is even sufficiently powerful to compete with computationalism. There are two ways in which this story is striking. The first is that FEC reflects the ongoing renewal of interest in Gibsonian ecological psychology (Gibson 1979) in cognitive science circles. (Note however that ecological psychology has been around and thriving for quite some time; it's just that cognitive scientists are coming back around to it.) The second thing that's striking about it is that FEC is very nearly identical to Brian Cantwell Smith's theory of registration (1996), a theory of representation cum ontology designed to account for intentionality in both humans and machines.

The similarity between FEC and Smith's theory of registration points to the reason that this collection ought to be of interest to the computationalists from whom it aims to reclaim cognition. Smith, a lapsed computationalist, suggests that the theory of registration follows from careful years of research on computation and attempts to carefully spell out the computationalist hypothesis that the mind is a computer. That is, if one tries really hard to do non-embodied cognitive science, one ends up concluding that the account of cognition one can cobble together from *Reclaiming Cognition* is correct. Perhaps, then, computationalists will end up here after all. They could save time by reading this collection sympathetically, along with Gibson 1979 and Smith 1996.

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