

# Sort-of symbols?

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**Abstract:** Barsalou's elision of the personal and sub-personal levels tends to conceal the fact that he is, at best, providing the "specs" but not yet a model for his hypothesized perceptual symbols.

John Maynard Keynes was once asked if he thought in words or pictures. "I think in thoughts," the great man is reported to have replied. Fair enough, but now what? What kind of things are thoughts, and how do you make 'em out of brainstuff? Keynes's

answer nicely alerts us to the dangers of oversimplification and false dichotomy, but is otherwise not much help. Similarly, Barsalou's alternative answer: "we think in perceptual symbols," is less informative than it might at first appear. There is something compelling about Barsalou's proposal that cognitive processes be described in terms of simulators (and simulations) involving modal as opposed to amodal formats or systems of representation. Restoring to serious attention the idea that you don't need a separate (amodal) symbol system to support cognitive functions is a worthwhile project. Moreover Barsalou has interesting suggestions about features that such a perceptuo-motor system ought to have if the brain, one way or another, is to do the work that needs to be done ("the ability to represent types and tokens, to produce categorical inferences, to combine symbols productively, to represent propositions, and to represent abstract concepts" (sect. 1.2.1), but just stipulating that this is possibly what happens in the brain does not begin to address the hard questions.

What does Barsalou mean by "symbol"? He uses the familiar word "symbol" but then subtracts some of its familiar connotations. This is, in itself, a good and familiar strategy (cf. Kosslyn's (1980) carefully hedged use of "image," or for that matter, Fodor's (1975) carefully hedged use of "sentence"). Once Barsalou's subtraction is done, however, what remains? It's hard to say. If ever a theory cried out for a computational model, it is here. He says: "perceptual symbol systems attempt to characterize the *mechanisms* that underlie the human conceptual system" (our emphasis; last para., sect. 2.4.6), but here he simply conflates personal and subpersonal cognitive psychology in equating mechanisms with representations; "an important family of basic cognitive processes appears to utilize a single mechanism, namely, sensory-motor representations" (last para. of sect. 2.4.7). These representations, by being *presupposed* to have the very content of our intuitive mental types, must be implicated in a most impressively competent larger structure about which Barsalou is largely silent. As "specs" for a cognitive system there is much to heed here, but the fact that this is *only* specs is easily overlooked. Moreover, if Barsalou's perceptual symbols are not (personal level) *thoughts* but sub-personal items of machinery, then the content they might be said to have must be a sort of sub-personal content, on pain of reinstating vicious homuncular fallacies.

Are *sort-of* symbols an advance on sort-of sentences and sort-of pictures? How? By not being amodal, one gathers, but also by being only somewhat, or selectively, modal:

First, diagrams such as the balloon in Figure 4A should *not* be viewed as literally representing pictures or conscious images. Instead, these theoretical illustrations *stand for* configurations of neurons that become active in representing the physical information conveyed in these drawings. (para. 3 of sect. 3.1)

Unless we are missing something, this is an assertion of specs without offering a clue about realization. As such, Barsalou's proposals do not substantially improve on "pure" phenomenology – leaving all the hard work of implementation to somebody else. Consider:

A simulator becomes increasingly active if (1) its frame contains an existing simulation of the individual, or if (2) it can produce a novel simulation that provides a good fit. (para. 2 of sect. 3.2.1)

Fine; now let's see a model that exhibits these interesting properties. We want to stress, finally, that we think Barsalou offers some very promising sketchy ideas about how the new embodied cognition approach might begin to address the "classical" problems of propositions and concepts. In particular, he found some novel ways of exposing the tension between a neural structure's carrying specific information about the environment and its playing the sorts of functional roles that symbols play in a representational system. Resolving that tension in a working model, however, remains a job for another day.