

## REPLY TO FIRESTONE

Chaz Firestone has produced a fine chapter. It presents my “moderate” approach to embodied cognition with great clarity; it shows appreciation for the novelty of the approach as compared with other proposals; and it sees the advance of this approach over its rivals. Firestone generously compliments it as a “refreshing and potentially game-changing approach.” That was the good news, of course. In the rest of the chapter, Firestone focuses on a particular example explored in detail in Goldman (2012), a putative example of moderate embodiment in *perception*. His verdict on this example is thumbs down. It just isn’t really an example of embodied cognition according to my own criteria. (A few explanatory remarks will follow shortly.)

What is my response? Firestone is correct; he has convinced me of his negative thesis. When properly interpreted, he argues, the phenomenon of “body-scaling” borrowed from Dennis Proffitt and colleagues turns out not to be an instance of cognition in the B-format sense. The remainder of this brief reply considers the consequences one might wish to draw from this concession.

The quickest and easiest move is one that Firestone himself anticipates: the proffered example of moderate embodied cognition simply doesn’t live it up to its billing. Just forget it, then. What do I stand to lose? In (Goldman 2013) my central thesis about embodied cognition is formulated as follows: “a significant amount of human cognition has its origins in representations of one’s own body” (p. 104). The phrase “a significant-amount” certainly leaves plenty of wiggle room. The satisfaction of such a criterion is by no means endangered if we choose to drop the original claim that perception (or much of it) is embodied. Innumerable other possible examples of embodiment are out there in possibility space. Quite a few of these were sketched in Goldman (2012); and even Firestone raises

no issue about them. So let's stop worrying; there's no reason to abandon our proposal or try to dilute it so as to please parties of every stripe.

Ending the discussing in this fashion, however, might be a bit abrupt and arguably sub-optimal. As Firestone points out, there is another alternative: tweak the criteria for embodiment so that body-based perceptual scaling *also* counts as moderately embodied. Let us explore this possibility.

First, let us review Firestone's reason for denying that body-based scaling in visual perception exemplifies the criteria for B-format based embodiment. Firestone explains that the information-processing that underlies body-based scaling in perception is entirely visual in nature, involving only geometric transformations on optical information. The visual system achieves its result by exploiting visual information *created by the body*, not by "redeploying" interoceptive bodily representations (for example, internally sensing one's height). Perception can and does represent space relative to the perceiver's body, but without employing B-formats. So, what kind of tweaking would accommodate visual perception as embodiment?

One obvious possibility would be to introduce a *disjunctive* criterion of embodiment: *either* embodiment in the B-formats sense *or* embodiment in the sense of one's body having a causal effect on a given type of cognition. The second disjunct was one of the earliest characterizations of embodiment that Vignemont and I considered in our joint paper (Goldman and de Vignemont 2009). Here was one formulation: there is embodied cognition when one's actions and other body-related traits (for example, posture) have an important causal role in cognition. The trouble is that really trivial cases would satisfy this criterion, thereby allowing cognitions to qualify as embodied far too readily. Nobody doubts that opening or closing one's eyes affects one's perceptions. Is this a reason to allow perception to qualify as embodied? Down this road, therefore, lies far too permissive a condition for embodiment. It would utterly trivialize the notion of embodied cognition. Better, then, to stick with the B-format conceptions of embodiment as originally proposed, and not disjunctivize it with a second conception, even if it means abandoning the visual perception example proposed earlier (for Firestone's reason).

## References

- Goldman, A. (2012) A moderate approach to embodied cognitive science. *Review of Philosophy and Psychology* 3 (1), pp.71–88.
- Goldman, A. (2013) The bodily formats approach to embodied cognition. In: Kriegel, U. (ed.) *Current Controversies In Philosophy of Mind*. Routledge, New York, NY. pp.91–108.
- Goldman, A. and de Vignemont, F. (2009) Is social cognition embodied? *Trends in Cognitive Sciences* 13 (4), pp.154–9.