

Jerry Fodor's amusing, insightful, but fatally flawed review of my book, *Supersizing the Mind*, (LRB, 12 Feb 2009) seems committed to the idea that states of the brain (and only states of the brain) actually manage to be 'about things': to 'have content' in some original and underived sense. "Underived content" he says "is what minds and only minds have". That's why, as Fodor would have it, states of non-brainbound stuff (like iPhones, notebooks etc) cannot even form *parts* of the material systems that actually constitute the physical basis of a human mind. But just how far is he willing to go with this?

Let's start small. There is a documented case (from the University of California's Institute for Nonlinear Science) of a Californian spiny lobster one of whose neurons was deliberately damaged and replaced by a silicon circuit that restored the original functionality: in this case, the control of rhythmic chewing. Does Fodor believe that, despite the restored functionality, there is still something missing here? Probably, Fodor thinks the control of chewing just fails to be sufficiently 'mental' to count. But now imagine a case in which an agent performs a simple division task using only her neural resources. Following damage, an external silicon circuit is added that restores the previous functionality. She now divides just as before, only some small part of the work is distributed across the brain and the silicon circuit. Now a genuinely mental process (division) is supported by a hybrid bio-technological system. That alone, if you accept it, establishes the key principle of *Supersizing the Mind*. It is that non-biological resources, *if hooked appropriately into processes running in the human brain*, can form parts of larger circuits that count as genuinely cognitive in their own right. Fodor seems to believe that the only way the right kind of 'hooking in' can occur is by direct wiring to neural systems. But if you now imagine a case, identical to the above, but with the restored functionality provided by a wearable device communicating by wireless, it becomes apparent that actual wiring is not important. If you next slowly alter the details so that the device actually provides for new functionality and does not simply restore old, and then piggyback on existing sensory mechanisms as way-stations, you end up with what Dave Chalmers and I dubbed 'extended minds'.

There is much more to say, of course, about the specific ways that non-implanted devices (iPhones and the like) might or might not then count, in respect of some enabled functionality, as being appropriately integrated into our overall cognitive profiles. Fodor seems to believe that such integration is impossible where part of the extended process look to involve what he describes as the 'consultation' (and then the explicit interpretation) of an encoding, rather than the simple functioning of that encoding to bring about an effect. This kind of consideration, however, cannot distinguish the cases in the way Fodor requires. Think of the case where, to solve a problem, I first conjure a mental image, then inspect it to check or to read off a result. Imagining Venn-Euler diagrams while solving a set-theoretic puzzle would be a case in point. Here we have a process that, while fully internal, involves the careful consultation of representations whose meaning is clearly a matter of convention.

As a final illustration, consider the trials (at MIT Media Lab) of so-called 'memory glasses' as aids to recall for people with impaired visual recognition skills. These glasses

work by matching the current scene (eg a face) to stored information and cueing the subject with relevant information (eg a name, or relationship). The cue may be overt (consciously perceived by the subject) or covert (rapidly flashed and hence subliminally presented). Interestingly, in the covert case, functionality is improved without any process of conscious consultation on the part of the subject. Now imagine (just as a thought experiment) a case in which the same cueing is robustly achieved by means of a direct hard-wired connection to the brain. Presumably Fodor would allow the latter, but not the former, as a case of genuine cognitive augmentation. Yet it seems clear that the intervention of visual sensing in the former case marks merely an unimportant channel detail.

There is thus plenty of logical and practical space, despite Fodor's protestations, for supersizing the mind: the machinery that makes minds *can* outrun the bounds of skin and skull.

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