

Evolutionary psychologists assert that our genetically driven cognitive endowment has evolved during the Pleistocene. As a consequence, our innate cognitive mechanisms are adapted to the environment of that period (the EEA) but not necessarily to our changed modern environment. One instance of mal-adaptedness is the fact that humans crave for fat and sweet food. This craving was adapted to the Pleistocene environment where high energetic food was rare, but is not to the modern environment of rich societies. There is a mismatch that causes obesity to spread, thus decreasing fitness.

The adaptedness of cognitive processes is characterised by a fit between the process and the environment. The fit means that the processes reliably lead to positive outcomes or tend to maximise results. The processes, however, do not lead to beneficial results because they perform a comprehensive analysis of the situation and an evaluation of each possible output. In fact, such processes work, and can be considered rational, only in a specified environment. They make the most of properties (esp. statistical properties) of specific environments. They are, as Simon and Gigerenzer put it, "ecologically rational".



"HUNTING AND GATHERING IS SO TIRING!
LET'S INVENT CREDIT CARDS SO WE CAN JUST CHARGE PEOPLE INTEREST!"

There is a puzzle that comes with the above assertions: if our cognitive apparatus is best adapted to the Pleistocene environment and if our modern environment depart more and more from this original environment of evolutionary adaptedness, then we should be less and less adapted, less and less ecologically rational, ... dumber and dumber. But this does not really seem to be the case.

One solution to this problem is to assert that the plasticity of the mind is such that we learn and adapt to the new modern conditions. But this does not seem to do all the work: see the obesity case.

The other solution is to investigate to which extent the new culturally constructed environment evolves itself to fit the human cognitive apparatus. Simon characterised ecological rationality using the image of scissors, where one blade was made of the cognitive mechanisms and the other of properties and statistical regularities in the environment. As a consequence, there is two related means to become sharper (i.e. smarter): adapt one's cognitive mechanisms to the environment (through learning), or adapt one's environment to one's cognitive mechanisms (through actions on the environment).

If evolutionary psychologists ignore or underplay the role of this 'sharpening' of ecological rationality, then they are lead to assert that humans become dumber and dumber because of the rapid changes in the environment. Evolutionary psychologists are mainly attacked for underestimating or ignoring the plasticity of the mind: they seem to underplay the role and extent of learning. To my knowledge, they are much less accused of ignoring or underplaying the sharpening

of the second blade of ecological rationality: changes in the environment often lead to increase in individual's and group's cognitive power. Gigerenzer et al. talk about (mental) heuristics that make us smart; taking ecological rationality seriously should lead us to speak also about engineered aspects of the environment (such as institutions) that make us smart.

My own work has been to draw on the history of science and mathematics to describe cases where cognitive power is increased by modification in the working environment of scientists. These modifications include changes in the material environment — making new cognitive tools available is a case in point — and it also includes modification of the cognitive environment via change in, and increase of, institutionalised scientific knowledge (knowledge distributed through institutional means and that is used as means for further scientific thinking).

One problem with such cases is that it is not very easily communicable. It seems that one does need to get into abstruse details to show how scientific cognition is actually empowered. For instance, it is hardly sufficient to say that the telescope enable scientists to see further away, or even to see in the past. In order to make one's case, one need to describe the historical cognitive practices. In particular, artefacts are made cognitively useful only if they come with a set of beliefs about their functions and how to use them (reciprocally, institutionalised knowledge come with a set of notations or formula as material means with symbolic function for scientific cognition). Changes in the material and the cognitive environment are strongly inter-connected and details of scientific practices and beliefs need to be described for pointing out the 'gains' in ecological rationality (at least in cognitive power).

So ... here is eventually the reason for my post: I just came across an interesting case of institution that make us smart. It is the current discussion in France about taxing fat and sweet food. The proposition for this tax is meant as an action against obesity (see this [article from Le Monde](#)). One could discuss tax policy, the cost that obesity has on the health system and so on. But I want rather to note that a rise in the price of sweet and fat food is an institutional decision that change the environment in ways that makes sweet and fat food more difficult to obtain because more expensive ... If the taxes go to subventions for green food, the relative difficulty for obtaining greens and sweet and fat food of the Pleistocene environment may be in some way reproduced. In other word, we have a proposal for an institution (the tax rules) that will reproduce some aspects of the Pleistocene environment to which we are adapted. The institutional fight against obesity goes against one key exemplar of mismatch between modern environment and human cognition as adapted to long past environment. The environment is culturally shaped so that our cognitive processes (or, here, our cravings) lead to good results.

Of course, the story is not always so happy (think about climate change: we also change the environment in ways to which we are definitively not adapted). But what this example bring about nicely, I think, is that there are whole stories about evolved cognitive abilities, ecological rationality, and the sharpening of the environmental blade.

I was wondering if some of you could come with other nice and straightforward examples.