

Abstract

How our Brains use the Past to Predict the Future

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Human beings have lived on earth for only a tiny fraction of the time for which living things as a whole have existed. The period is even shorter if we focus on evidence for recognizably modern human activities, such as trade, production of art-work and sophisticated tool-making. Much of our present-day activity as humans must therefore be overlaid on a biological heritage. This heritage forms the basis of human success and endeavour, particularly in times of struggle, but may also lead people into actions that are sometimes counter-intuitive and apparently irrational.

Our insight into these questions can be improved from modern studies of cognition, using the techniques of neuroscience and behavioural analysis. The major biological advantage of possessing a large brain is the capacity to free ourselves from the immediacy of the present. Compared with animals, humans can remember a greater number of things in more complex ways. In itself, this is a huge advantage. However, human consciousness also allows us to rehearse future scenarios based on this stored information. With this capacity, we can benefit from the past by exploring possible futures.

I shall look briefly at some scientific evidence that illustrates these points. First, we find certain tasks, such as playing chess, difficult, whilst other tasks, such as walking through a crowded room, are easy. In this regard, humans are very different from computers and robots. Second, human individuals set values on the outcomes of decisions: the rising field of neuroeconomics explores how subjects use their memory of past events to set values on predicted outcomes. Third, recent brain imaging studies have probed which parts of the brain are involved in keeping track of events in a prolonged visual narrative, such as a silent movie.

Humans make use of conscious reasoning to evaluate scenarios in many contexts, but any particular decision that they take is often influenced by other assumptions and values, which often arise from outside the immediate context. This tendency is, on different occasions, a strength and a weakness. It is suggested that collective decision-making may be most successful, if it takes account of this tendency of individual participants.