

The Power of Curiosity

Dies lecture

by

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Esteemed rector, honoured guests,

In our own familiar surroundings, with our own customs and with people we know well, we tend to feel safe and secure. It is nice and good to have such close ties with those who are closest to us, because together we can achieve more than we ever could on our own¹. But at the same time it is important to realise that we can learn more from those outside our circle – people with a different outlook on life, a different religion, a different educational background or a different culture, for example – and that collaborating with *them* paves the way for renewal and innovation. My youngest son has just turned one. He crawls towards anything and everything I put in front of him with his mouth wide open. The curious look on his face as he explores the world with the confidence that ‘everything will work out all right’ is very different from that of my three-year-old son, who is still curious but much more cautious about new things and unfamiliar people. While it may not always be ill-advised to curb our curiosity, doing so can prevent us from seizing opportunities or lead us to exclude certain groups of people. It is therefore important that we are aware of this.

Why is it that we curb our curiosity and have reservations about people who are different from us? If we can learn so much from them, why don't we engage with them? The answer lies in our evolution. Evolution has ensured that we are not purely rational beings. Although we sometimes like to think of ourselves as such, the fact is that our decisions, including the most important ones – saving for a rainy day, which political party to vote for, or what to buy at the supermarket² – are often driven by emotions. Following our intuition often works out well and saves us from having to go through a lengthy thought process for every decision we make. The downside to that is that our emotional drivers can sometimes make us too short-sighted. If we are to understand motivations that are not purely rational, it is useful to study both contemporary social factors and those from recent history. To really get to the heart of the matter, I examine the origins of our behaviour from an evolutionary perspective. Then we suddenly understand why populists have such a strong appeal³, why a certain smell can move us to tears⁴, why we are disproportionately disgusted by the sexual behaviour of chimpanzees⁵, why some men send dick pics⁶, why we are unable to think logically about our death⁷, and also why we are so focused on our familiar environment and close ourselves off to strangers.

Six million years ago, an ape walked the earth and split into the genera *Homo* and *Pan*. Of the former, one species remains; we humans. The *Pan* genus gave rise to two species; the chimpanzee and the bonobo. The latter emerged two million years ago when they became isolated in a nutrient-rich, safe area surrounded by the Congo River and split off from their common ancestor. Chimpanzees, like humans, also expanded into territories where conditions were less hospitable. The different evolutionary paths manifested themselves in unique traits. Wild bonobos are curious about conspecifics they are unfamiliar with. If they encounter them in the wild, they deflea them, form alliances and share food⁸. Because bonobos never had to compete for scarce resources, they evolved into a tolerant species. Chimpanzees, on the other hand, did

not have this luxury and are wary of other groups. They patrol the borders of their territories, wage war and do not cooperate with the ‘outgroup’⁹. Humans share traits with both. We barter and trade with strangers, weep for the victims of disasters in faraway places and donate money to charities. And at the same time we beat each other to a pulp. How has evolution shaped our emotional experience? This is a question that my team and I recently asked ourselves¹⁰. On a touchscreen, we presented emotional expressions to both bonobos and visitors to a zoo. The images were of strangers or loved ones (in the case of the zoo visitors, photos were taken on the spot by friends or family). The results showed that where humans’ attention was drawn by the emotions of people they knew, bonobos were in fact curious about the emotions of unfamiliar conspecifics. Does this mean that humans are not interested in the emotions of strangers? And why is it that these strangers attract the attention of bonobos?

Questions like these help me to think about possible explanations for certain findings. For example, perhaps bonobos sense opportunity where humans see risk. We are currently assessing the various explanations in a follow-up study. My PhD supervisor once said that ‘all good research raises more questions than it answers’. Good research answers the question you are investigating, but also stimulates further reflection. This process fuels my desire to know more about emotions¹¹. How do we express emotions, and how do we respond to the emotions of others? It is becoming increasingly clear, both through my own research and that of others, that various and crucial emotional considerations have an ancient evolutionary basis. On the one hand, we can infer this from social neuroscience, which repeatedly points to the crucial role of evolutionarily ancient hormonal systems and neural networks^{12,13}. On the other hand, it derives from the remarkable similarities with related species and from the possibility of comparative animal research^{14, 15}. Over the course of human evolution, mutual trust enabled humans to cooperate in groups and societies to flourish¹⁶. The fundamental dilemma, however, is that even within groups, individuals must be vigilant in order to see through people with bad intentions. A person's reputation can be a significant factor here. And in the absence of knowledge of a person's reputation, expressions of emotion play a crucial role in encounters with strangers. My research has shown that humans – and other primates – use other people's emotional expressions to form a first impression as to whether that other can be trusted¹⁷⁻¹⁹. Subtle expressions are key here. For example, it is well known that our pupils dilate in the dark, but also when we are excited, emotional or interested in another person. This sends a positive signal to the other person – that they are important, that you are interested in them – which then inspires trust.

The underlying mechanism of this positive association is, perhaps, even more fascinating. In follow-up experiments, we found that *mirroring* the size of the pupils between two people creates trust²⁰⁻²¹. A peek inside the brain revealed what was going on. Firstly, we saw that subcortical areas became activated; these are areas of the brain below the cortex, the blueprint of which was already there before mammals roamed the earth. We also saw that the cortical ‘social’ brain network was involved; a network that allows us to empathise with others²². In other words, our

decision-making areas receive direct input from our emotional areas. Our blind date experiment²³ also showed that rational, well-considered behaviour is an illusion. In this, we observed facial expressions, posture and physiological responses such as changes in heart rate. As expected, people mirrored each other on all these levels. But it was only the synchronisation of physiological processes that predicted the success of a date. A smile wrong-footed male participants in particular, because smiling revealed no evidence of how attractive a woman found her partner. We suspected that physiological processes might be perceived by the other person at a subconscious level through subtle changes in the face. And sure enough, in a subsequent study, we found that when people are able to look at each other, they synchronise more than when they cannot, and that this promotes cooperation²⁴. Subtle cues such as pupil dilation play a bigger role than previously thought²⁵. The unconscious level at which these processes operate makes them an accurate reflection of how a person actually feels²⁶. My team and I have now shown that children²⁷ and chimpanzees^{28, 29} also synchronise physiological processes and that this generally enhances interaction²⁰⁻²⁴ and influences emotions²³ and well-being³⁰.

I was once asked during an interview for a grant application, ‘Why is it useful to know that apes also have emotions?’ This question is tougher to answer than, say, a cancer researcher comparing the effects of treatment A and treatment B. And yet fundamental research is no less important. Uncovering the evolutionary underpinnings of our behaviour would help to further solve the puzzle of human drivers and, where possible, help people to make better decisions. For example, if we know that a certain behaviour occurs in chimpanzees and humans but not in bonobos, we can conclude that it is likely to be a trait that was shared by our common ancestor but was no longer useful in the environment in which the bonobo evolved. And if it is a negative trait, it is useful to know why the bonobo does not exhibit that behaviour. Only through comparative research can we discover unique behaviours or similarities³¹. Understanding the evolutionary basis of emotions can help us develop more effective strategies to promote and support cooperation, both at the individual and societal level.

Curiosity, the desire to know, is the bedrock of science. It is not a luxury. Fundamental, curiosity-driven research often has more applications in society than research that solves a direct problem. This is because it has a much broader scope. There are many examples of serendipitous scientific discoveries that have contributed to breakthroughs and new knowledge. The discovery of penicillin, X-rays, radioactivity, microwaves and Viagra are just a few notable examples. All of these were discovered by accident, driven by the intrinsic motivation of a curious scientist to explain a random observation. These examples illustrate the importance of curiosity, openness and the ability to spot and further investigate unexpected observations. Curiosity-driven research stimulates interdisciplinary research and collaboration between different disciplines. This is vital, because it challenges scientists to look beyond their own fields and to explore new perspectives. In turn, this can lead to innovative breakthroughs and new insights that would otherwise remain undiscovered.

So, are we to conclude from this story that people should pursue their curiosity without restraint? Well, no. We need to strike a balance between caution and curiosity so that we can seize new opportunities and continue to develop, but not wander off on too many tangents and lose our focus. But let us never lose our curiosity about each other and take pride in being social animals. Looking out for each other ensures that we can help or support each other in times of need, but also helps us to reflect on ourselves.

‘Dixi.’

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