

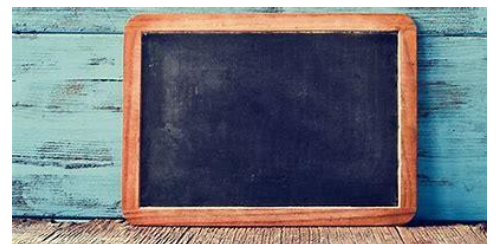
# Nature versus nurture

Are we shaped more by our genes or the environment in which we grow up and live?



The phrase “nature versus nurture” refers to a long-standing debate in human biology: to what extent is our behaviour shaped by our genes (nature) or by the environment in which we grow up and live (nurture)? The short answer is that it is a bit of both.

Many pre-scientific thinkers argued that the human brain was a blank slate or *tabula rasa*. In other words, they believed that babies were born without any pre-existing knowledge, habits or skills and had to learn everything through experience. This idea can be found in the writings of the philosopher Aristotle and more recently in *An Essay Concerning Human Understanding* by John Locke. Believers in the blank slate model also emphasised the role of nurture in shaping human behaviour.



The opposing viewpoint emphasising the role of nature is called innatism. With this perspective, babies are thought to be born with certain built-in knowledge and ideas. This view was held by Plato and later by René Descartes. The strongest versions of this pro-nature viewpoint hold that experience doesn't create new knowledge, but merely helps us unearth knowledge that our brains already contain.

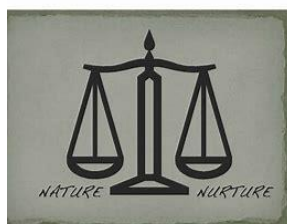
The truth seems to be a complicated mish-mash of both ideas. We are shaped by both our genes and by our experiences, and the two

interact in complex ways: it isn't so much "nature versus nurture" as "nature with nurture".

On the nature side, there is clear evidence of genetic influences on many of our behaviours. For instance, it appears that facial expressions are at least partially inherited. Our genes seem to affect how well we do in exams. Perhaps reassuringly for parents who are struggling to do what is best for their children, there is some evidence that how kids are raised and schooled doesn't seem to affect their achievements much, provided they aren't severely neglected or abused. As people get older, their inherited proclivities appear to outweigh the effects of childhood experiences.

However, the evidence that the environment affects us is equally powerful. Most dramatically, there are cases of children who have lived in the wild with minimal human contact. They typically struggle to learn to speak and can prefer to walk on all fours.

Similarly, children who are neglected as babies often have developmental difficulties. Furthermore, while male and female brains may not be identical, there is evidence that parents treat boys and girls differently, leading to greater differences in behaviour than the innate differences alone could generate. Even our risk of disease, which we often think of as being heavily influenced by our genes, is much more strongly connected to the microorganisms and other experiences to which we are exposed.



One way of thinking about this is that our genes shape our temperament, but the specific choices we make are much more closely linked to our experiences.

What's more, nature and nurture can interact. One mechanism for this is epigenetics - our experiences can affect our genes, at least temporarily. For example, mice that learn to fear a particular smell seem to pass that knowledge on to their descendants. These epigenetic changes start early in life, so if we could run our lives over, we might well turn out differently.