

Programmed to take risks

Aria Pearson

AS HUMANS migrated out of Africa around 50,000 years ago and moved across the planet, evolution may have latched onto a gene linked to risk-taking and adventurousness.

The idea, first put forward by Chuansheng Chen at the University of California, Irvine, more than a decade ago, was originally met with scepticism. Now Luke Matthews of Harvard University and Paul Butler of Boston University have shown that a link between two versions of a specific gene and ancient migration patterns stands up to rigorous analysis.

The *DRD4* gene codes for a dopamine receptor in the brain. It exists in several versions, or alleles, and studies have shown that people tend to have slightly different personality traits depending on which they have. The 4R allele, for instance, is associated with being even-tempered, reflective and prudent. The less common 7R and 2R versions have been linked to impulsive and exploratory behaviour, risk-taking and the

ability to shrug off new situations. Matthews and Butler think that migrants with these versions were better able to deal with dangerous, fluctuating situations and more likely to survive and reproduce under those conditions.

They looked at the frequency of 7R and 2R in 18 indigenous populations spread along the routes humans took from Africa to Europe, Asia and the Americas.

The further away from Africa they were, the more likely they were to have either of these two versions (*American Journal of Physical Anthropology*, DOI: 10.1002/ajpa.21507).

The problem with Chen's 1999 study was that populations can share alleles simply by chance, which might create the illusion of a link between, say, distance travelled and certain alleles. To overcome this, Matthews and Butler modelled how alleles randomly show up in populations. They discovered that the distribution of 7R and 2R is not random, and were able to demonstrate a statistically

significant link between the alleles and migration.

The study suggests that some small portion of the behaviours that characterise populations may be down to genetics, and that cultural actions like mass migration can modify our genes, says Matthews.

Marcus Munafò, a biological psychologist at the University of Bristol, UK, cautions that variations in the *DRD4* gene are numerous and complex, making its exact behavioural effects hard to pin down. But he agrees that it is likely that some differences in behaviour have been generated by genetic selection.

Researchers are beginning to play with the idea that our culture could be influencing evolution, says Robert Moyzis of the University of California, Irvine. He has shown that 7R arose as a rare mutation 40,000 to 50,000 years ago, after we left Africa, then spread rapidly in human populations. The 2R allele is a modified version that arose in Asia less than 10,000 years ago.

He has also shown that people diagnosed with attention deficit hyperactivity disorder are twice as likely to have the 7R allele. He thinks some of what we consider ADHD symptoms, like rapidly shifting focus and quick movements, are actually survival traits that were selected for during our migration out of Africa. ■



DANIEL RAMSBOTTOM/PA/CORBIS

Thrill-seeking genes?