



# Human nature: the remix

People's mindsets are neither fixed by evolution nor infinitely malleable by culture.

**Dan Jones** looks for the similarities that underlie the diversity of human nature.

**D**arwin famously gave scant attention to humans in *On the Origin of Species*, contenting himself with the teasing pledge that "Light will be thrown on the origin of man and his history". The promised light came in the *The Descent of Man, and Selection in Relation to Sex* (1871) and *The Expression of the Emotions in Man and Animals* (1872), in which the notion of a common human origin was crucial. In *The Expression*, to further his case that humans shared a great deal of their nature, Darwin "endeavoured to show in considerable detail that all the chief [emotional] expressions exhibited by man are the same throughout the world".

Darwin often relied on anecdotal accounts



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of travellers and his own casual observations in drawing these conclusions. His poorly sourced claims came, in time, to be challenged by anthropologists focused on the particularities of, and differences between, various cultures. In the 1960s, guided by the prevailing anthropological orthodoxy, Paul Ekman, now retired, set out to prove Darwin wrong by asking for interpretations of facial expressions from the farthest flung people he could get to. He ended up confirming that Darwin had a point. "The evidence is very strong, from studies of both recognition and expression in Western and Eastern, literate and preliterate, cultures that Darwin was indeed prescient," says Ekman. "At least six, perhaps seven, emotions have a pancultural facial expression."

The expression of these emotions is not the only human commonality revealed by cross-cultural studies. People everywhere form communities and pay attention to kinship systems, use complex languages to communicate, socialize and adorn their bodies. Some of these common motifs simply reflect givens of human existence. Many languages use a word related in meaning to 'small person' to describe the opening in the eye's iris, as English does, but this needs no explanation beyond the fact that pupils show the viewer a small reflection of his or herself. Others have deeper significance.

In 1991, anthropologist Donald Brown, then at the University of California, Santa Barbara, published *Human Universals*<sup>1</sup>, a survey of hundreds of candidate universal similarities from domains as diverse as language and status

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systems to concepts of time and incest taboos. “It was primarily designed to disabuse anthropologists and others of the notion that universals are few and trivial,” says Brown, and it immediately found a warm reception among the then-emerging field of evolutionary psychology, which championed the idea of a universal human nature explained by evolution.

But although some anthropologists had simply denied the existence of the human universals that evolutionary psychology craved, others had put forth a subtler view. As the late Clifford Geertz wrote:

The notion that the essence of what it means to be human is most clearly revealed in those features of human culture that are universal rather than in those that are distinctive to this people or that is a prejudice that we are not obliged to share... It may be in the cultural particulars of people — in their oddities — that some of the most instructive revelations of what it is to be generically human are to be found<sup>2</sup>.

Today’s research is taking that message, as well as Brown’s, to heart. An emerging cadre of anthropologists and evolutionary theorists is taking a new look at the way oddities and difference shed light on the universal. Human nature, this line of thinking holds, is like the control panel on a mixing desk. It is not infinitely malleable: it has its fixed channels and its presets. But it has lots of faders and switches to play around with, and their cultural twiddling can produce a surprisingly wide range of effects.

### Is fair fair?

Trying to understand human nature this way has required some academic reconciliation. “We’ve had to demonstrate to those who emphasize cultural diversity that there is still a useful and interesting way to talk about human nature underpinning the diversity,” says Justin Barrett, a cognitive psychologist at the University of Oxford, UK. “At the same time, we’ve also had to convince those on the biological side that explaining the complexity of human cultural behaviour requires more than a simple application of the rules of animal behaviour.” And the reconciliation is still a work in progress. As anthropologist Joe Henrich of the University of British Columbia in Vancouver, Canada, puts it, “We’re all comfortable with evolved aspects of the human mind as well as the importance and power of cultural transmission — but there are large swathes of academia that haven’t yet reached this constructive consensus.”

Henrich’s commitment to the cultural plays out in the way he does research. He and his team have gone out and sampled humanity’s cultural diversity in various far-flung reaches of the world, combining in-depth ethnographic work with experimental tools from the psychology lab. “A lot of us are trying to be seriously quantitative about these things,” says Henrich.

A notable example of the approach comes from a staple of behavioural economics, the ‘ultimatum game’: one player of a pair is given a sum of money, say ¥100, and has to offer the other some proportion of it. If the offer is accepted, the money is split as proposed; if

it is rejected neither player gets a thing. The proposer thus has to gauge what his or her partner will think fair, or at least accept. Western subjects often reject offers of less than 30% of the money. In a landmark study, Henrich’s team took the game on a world tour to 15 diverse small-scale societies. In some places people rarely or never rejected very low offers; in others, surprisingly, they rejected more-than-fair offers of greater than 50%<sup>3</sup>. This fits with the finding that ‘altruistic punishment’ — people’s willingness to punish free-riders who parasitize the efforts of others — varies dramatically across societies<sup>4</sup>, even while being present in

some degree in most. The fairness fader, if there is one, can clearly be set at a wide range of positions.

### Enter the WEIRDos

These studies call into question conclusions about universals derived from looking at limited, and possibly unrepresentative, groups of subjects — which is a problem with most psychology studies. Henrich classifies them as WEIRD — Western, educated, industrialized, rich and democratic. What’s worse, undergraduates, the lab rats of psychological studies, are weird even by the standards of WEIRDos.

Why should this make a difference? “Our kids grow up with a lot of active teaching compared with small-scale societies,” says Henrich. “Our brains are trained for the particular and strange world we inhabit, one where we’re not foraging for food, hunting game or constantly under the threat of disease.” Although WEIRDos may use universal foundations to build up their strange ideas (see ‘Universal maths’), not everyone has a culture that encourages such things.

The argument is borne out by research: an as-yet unpublished review by Henrich and his colleagues Steve Heine and Ara Norenzayan that looks at available cross-cultural studies confirms that WEIRDos are outliers in many ways. Humans, for instance, have a tendency to prefer a smaller immediate gain to a larger but delayed reward. Yet to say that discounting

“At least six emotions have pan-cultural facial expression.”  
— Paul Ekman



## Universal maths

There is evidence that humans have not just one innate number system, but two. The ‘analogue estimation’ system evaluates quantities in an approximate manner by relating them to imprecise notions such as ‘amount of stuff’ or ‘extent of imaginary line’. The second system is more exact, but can initially, and innately, keep track of only three or four items<sup>1</sup>.

The exact number system can handle larger numbers, but this requires cultural learning and elaboration (the analogue system seems to function in much the same way across cultures). Some societies, such as the Pirahã of the Amazon, have little need for large exact numbers (they do not trade or keep accounts), and use only ‘one’,

‘two’ and ‘many’. The Pirahã also perform poorly at lining up groups of three or more objects (nine nuts, say, with nine batteries), or estimating when the last of 15 beans has been removed from a tin. Without the cultural demand for trading in large numbers, they have neither developed the concept nor invented the words<sup>12</sup>.

Cross-cultural studies also suggest that a basic grasp of geometric concepts, such as points, lines and parallelism, is a universal component of human cognition, or at least found in disparate cultures<sup>13</sup>. A similar story holds for how people relate numbers to space, but with an interesting twist. Western adults tend to order clusters of dots (grouped in 10, 100 and 1,000), along a linear

scale, so that the distance between the group of 10 and 100 is much smaller than the gap between 100 and 1,000. Western infants, by contrast, group numbers on a logarithmic scale, with the gap between 100 and 1000 the same as that between 10 and 100. Cross-cultural studies among the indigenous Amazonian Mundurucú revealed that both children and adults order numbers logarithmically. Together with the results from Western infants, this suggests that the logarithmic system could be an innate and universal aspect of mathematical thinking, one that gets tweaked in Western populations through formal education in certain mathematical tools and techniques to produce a switch to the linear system<sup>14</sup>. **D.J.**

in this way is a human universal glosses over the dramatic differences in discounting seen in different cultures. Among the Tsimane of the Bolivian Amazon, future discounting is ten times what you find in the United States; by this measure the Tsimane care even less about the future than do American drug addicts, typically regarded as pathological future discounters.

To try to get deeper into these issues, researchers are looking for ways to gauge not what people say, but how they actually think. “Cognition bridges the biological and the cultural,” says Barrett. A cognitive approach focuses attention on what human minds come equipped with, and how they develop — a process that involves much more than just unfolding according to some pre-specified blueprint. “What you really want to study are developmental processes, and how they interact with culture,” says Henrich. A model here is Noam Chomsky’s pioneering work in linguistics (see ‘Universal language’). Chomsky, at the Massachusetts Institute of Technology in Cambridge, united the study of universals and diversity across the world’s languages by proposing an innate mental system to acquire, use and comprehend language, which operates on the basis of a great deal of culturally specific input. The constraints placed on humanity’s vast linguistic diversity by a shared ‘universal grammar’ does not make the study of languages less interesting — it just makes it more tractable. The same might apply to phenomena as seemingly complex and socially mediated as religion (see ‘Universal religion’).

Ideas with a distinct Chomskyan flavour have been a stimulus to recent thinking about morality. What counts as a moral transgression, and



how one should react to the transgressor, vary from culture to culture. But deeper patterns seem to lurk beneath this surface diversity.

Following Chomsky’s lead, a number of researchers are working on the idea that an innate and universal moral grammar might underlie human ethical judgements. A series of web-based studies led by Marc Hauser of Harvard University have suggested that moral judgements can be explained in terms of such universal and fundamental moral principles<sup>5,6</sup>. Harm caused by direct physical contact, for instance, is generally deemed to be morally worse than harm arising as a side effect, as are

harms caused by specific actions rather than omissions.

But these are early days in fleshing out the tool kit of putative moral principles and parameters. “By the time Chomsky started his work in the 1950s he already had a massive amount of descriptive linguistics from all over the world to play with,” says Hauser. “In the case of morality, we don’t have anything like what the linguists had 50 years ago. We don’t know whether the distinctions we’re making are at the right level of abstraction, or whether they are principles or parameters.”

Web-based surveys are necessarily biased

## Universal religion

Whereas human individuals can be atheists, and an increasing number are, human societies are historically universally religious. The detailed beliefs that people have about the powers and roles of deities are not universal or innate. But that doesn’t mean that they don’t share a common cognitive basis. “There is no God part of the brain,” says anthropologist Scott Atran of the University of Michigan in Ann Arbor. “But there are many different kinds of universal process involved in religious thinking that converge to generate a set of family resemblances between religions across cultures.”

Much of the evidence for this

claim comes from developmental studies with children. “Supernatural thought is so ubiquitous in part because it is so readily accommodated by human cognitive systems from early childhood,” says Justin Barrett, a cognitive psychologist at the University of Oxford, UK. “Children seem naturally predisposed to accept the idea that there exist supernatural intentional agents, that the natural world is intentionally designed and purposeful, and that something of human identity is separable from human bodies, allowing for ready belief in some kind of afterlife.” But although supernatural beliefs may be in this sense ‘natural’, they also

typically violate assumptions about how the natural world works that seem also to be hard-wired. A god, for example, has most of the properties of a human, with key exceptions; it may not, for example, have a body.

Atran suggests that such violations can make certain supernatural concepts more salient and memorable. At the same time, too many violations can make them confusing. So the deities and supernatural agents that populate the world’s belief systems fall into a family, with each member being like a natural object in many respects, and decidedly unlike anything natural in a few others.

Atran suggests that religious belief may have been particularly important in the cultural evolution of large-scale societies. As societies grow, it can be harder to enforce moral and altruistic norms, and punish free-riders on the public good. This in turn can make such societies less cohesive and less able to compete with other expanding societies. Moral deities do lots of things,” says Atran. “Crucially, they define the sacred boundaries of societies and the taboo things you can’t do. If you really believe in these moral gods then the problem of punishment becomes easier, as you punish yourself.”

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## Universal language

Children are prodigious language learners, and natural-born chatterboxes. In the 1950s and 1960s, though, it was widely held that language learning was simply a learning of associations between words and things. Noam Chomsky, a linguistics expert at the Massachusetts Institute of Technology in Cambridge, argued that something more specific was going on. There was, he said, simply not enough data in the child's linguistic environment for an associationist account to be plausible. And the way children speak reflects the use of rules or principles that they could not have inferred from what they had heard. Something must guide the

way language develops.

The solution Chomsky provided — an innate universal grammar — remains controversial. The basic idea is that humans are born with a set of mental principles making up a grammar that constrains how any human language can be built. The principles of this universal grammar shape language acquisition and underscore the commonalities seen among the world's languages. But Chomsky's approach also accounts for diversity with the idea that the universal grammar came with 'parameter switches' that are set differently in different languages. Creating an inventory of these principles and parameters — what is

fixed and what is flexible — has been a major preoccupation of numerous linguists over the past 50 years.

To take a common example, some languages, such as English, are said to be 'head first' and verbs precede direct objects, which means I would write John ate toast. Japanese, by contrast, is head-last — so Kenji sushi ate. In both languages, the same principle constrains how certain kinds of word or phrases can be put together — the phrase has to have a head and some other words in any order — but the head-position parameter (first or last) is set by cultural learning. Universality and diversity blend together seamlessly.

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towards the more educated and affluent, so the answer is to go and look at less WEIRD data — which makes the picture more complex. In a recent study<sup>7</sup>, Hauser and his Harvard colleague Linda Abarbanell ran a variety of moral scenarios past a largely uneducated rural Mayan population. Compared with web-based subjects, this decidedly non-WEIRD group gave much less moral weight to distinction between acts and omissions. Hauser and Abarbanell think that the weight put on that dichotomy is a parameter that can be set by local culture, just as some grammatical practices are.

A bird's-eye perspective on moral diversity and uniformity comes from psychologists Jonathan Haidt, of the University of Virginia in Charlottesville and Craig Joseph, of Northwestern University in Evanston, Illinois. Surveying anthropology and evolutionary psychology, they argue that evolution has built into the human mind a preparedness to care about five sets of social issues: fairness and justice; avoiding harm to and caring for others; in-group loyalty; social hierarchy and respect for authority; and the domain of divinity and purity, both bodily and spiritual<sup>8</sup>.

"Morality is a social construction, but each society constructs it on top of these five innate moral foundations, relying on them to varying degrees," says Haidt. "Some moralities, such as those of secular Europe, rest primarily on the

first two, prizing concerns about harm and fairness above all else; other cultures, such as those of traditional India, emphasize fairness less, and the virtues of respect and spiritual purity more."

### Liberal differences

Haidt and his graduate student Jesse Graham also argue that differential use of the five foundations illuminates the difference between American liberals and conservatives: whereas the former have hypertrophied sensitivity to fairness/justice and harm/care, and atrophied

interest in the rest, conservatives are sensitive to all five channels<sup>9</sup>. This inevitably leads to disagreements about what counts as a moral issue, and differences in how moral debates are approached.

Moral norms are a prominent, but by no means exclusive, subset of the broad class of cultural norms. These are the social rules that govern a great deal of people's behaviour in everyday life — from what to wear and how to meet and greet people, to tipping and queuing. Although invoked remarkably often, the psychology of normative behaviour still remains poorly understood.

Psychiatrist Chandra Sekhar Sripada, at the University of Michigan in Ann Arbor, and philosopher Stephen Stich, of Rutgers University in New Brunswick, New Jersey, have surveyed the widely spread literature on normative psychology, and argue that humans are innately

and universally equipped with two key pieces of psychological kit that underlie the phenomenon<sup>10</sup>. The first is a norm-acquisition device, in some ways like Chomsky's language acquisition device, which is responsible for picking out and absorbing local norms. The second generates an intrinsic motivation to comply with these acquired cultural norms, which change over time and diverge between groups. If Sripada and Stich are on the right track, then humans are biologically built to be cultural — and different. The universal design specification is not merely compatible with cultural diversity; it is one of the engines that drives it.

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**"Supernatural thought is so ubiquitous because it is readily accommodated by human cognitive systems."**

— Justin Barrett



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