

CHAPTER 3

Trust, Emotional Commitments and Reputation

Abstract

How did our uniquely human commitments to our loved ones develop, and why are we so concerned about what feelings lie underneath what other people do? In this chapter, we consider the origins of our long-term emotional connections based on trust, and how they lead to uniquely human sensitivities to what motivates other people and how they feel about us.

As we have seen in Chapters 1 and 2, new types of emotional connections, and new ways of collaborating to survive, emerged in early humans after 2 million years ago. This was a time when changes in emotional dispositions led to a greater willingness to share with, and care for, a wider set of individuals. Archaeological evidence demonstrates care for vulnerable adults, within the contexts of both food sharing and of collaborative care for increasingly dependent offspring.

(Abstract continued on next page)

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The emergence of strong emotional bonds based on high levels of give and take at this time laid the basis for human trust, emotional commitments and love. Yet these long-term emotional connections also seem to have come at a price. The importance of knowing who to trust brought with it pressures to be acutely focused on displaying our genuine intentions (or hiding our less genuine ones), and on identifying the genuine emotional motivations of others. Considering the importance of relationships based on trust, and with this emotional astuteness about *who could be trusted*, may yield important insights into many debates about our origins. These include the cultural transmission of ideas, the explanations for an increasing concern with symmetry and the aesthetics of form in stone tools after 2 million years ago, and the mechanisms behind how people who thought differently may have been integrated into human populations.

Long-term relationships based on trust and a sensitivity to the emotional connections underlying people's words or actions may have been much more important in our distant past than we have previously recognised.



Figure 3.1: Our sensitivity to others’ feelings and to who they are as a person prompts us to feel transported into the mind and feelings of the artist who created these lions from Chauvet cave, France, around 30,000 years ago. Image from replica at Brno Museum Anthropos (Czech Republic). Public domain, via Wikimedia Commons: [https://commons.wikimedia.org/wiki/File:Lions_painting,_Chauvet_Cave_\(museum_replica\).jpg](https://commons.wikimedia.org/wiki/File:Lions_painting,_Chauvet_Cave_(museum_replica).jpg).

Introduction

Many highly evocative examples of European Ice Age art affect us emotionally. Simply experiencing the depictions of lions at Chauvet cave (Figure 3.1) seems to transport us to the time, place and mind of the artist who created them, for example. Realistic depictions like these appear after 50,000 years ago, not only in Europe but as far afield as Indonesia. Debates about the meaning of such depictions have continued for well over a hundred years. However, beyond the specific meaning of any one painting or artefact, such art also tells us about a uniquely human sensitivity to how others feel. Even though all we are looking at is stone and paint, or even, perhaps, just an

image on the screen or paper, we feel intimately emotionally connected to the artist, despite the many thousands of years between us. We feel that we are in some way in the moment, and in the mind, of whoever painted this picture. We get a sense that the artist knew how we would feel in viewing this image, at least on some level, despite the thousands of years and widely different cultures and experiences between us. We also have some sense of how they themselves felt when remembering these lions.

Our emotional brains are finely attuned to identifying not just what people believe but how they feel and the *emotions behind why they do what they do*. Yet, despite the complexity of these judgements, we scarcely notice we make them. Every story, action and item of gossip is subject to our unthinking judgement about its implications in terms of what people feel, and what they might feel about us. We cannot help being driven to try to understand what they mean about whether people are trustworthy or not, whether they are on our side, and even what their emotional motivations mean about the world as a whole. Because of this sensitivity, we are also almost inescapably drawn to infer the emotions behind art, a topic we return to in more depth in Chapter 5.

Why should it matter to be so attuned to others' feelings and motivations?

Some of the explanations for our acute sensitivities to other people's feelings lie in changes in recent human evolution over the last 300,000 years (discussed in Part 2). However, the origins of our attention to what lies behind other people's actions seem to lie much further back in time. The interdependence within groups of early humans, as far back as 2 million years ago, reflected in their willingness to care for adults with vulnerabilities (discussed in Chapter 2), seems to have triggered important changes in emotional connections. We hardly imagine our distant ancestors as *trustworthy*. However, so much of what kept groups alive may have depended on trust, whether that was raising vulnerable offspring and protecting them from harm, finding food together or tackling dangerous animals (Spikins 2019). Only by caring deeply about others would early humans have been motivated to help them when they were ill, share food with them, or risk their own lives to defend them from predators. Such willingness to help risks exploitation, however, perhaps from an individual's ally or mate who might abandon them in a time of need. *Abilities to make the right choices about*

people and to correctly judge others' motivations and emotional commitments towards us will have been increasingly important.

The significance of trust to our evolutionary history may tell us something important about why we are so acutely attuned to what other people feel about us, and why it is not just social connections that we need to thrive today but shared emotional commitments marked by genuine care and trust.

Trust and a sensitivity to emotional motivations in human evolutionary origins

Our human drive to understand the emotions behind other people's actions

When we consider how human minds and societies developed, we have traditionally paid a lot of attention to the significance of our strategic social thinking or cognitive empathy (see, for example, Dunbar 2003; Noonan et al. 2018), explained in Chapter 1. We often hear about the 'social brain' or theory of mind, how unusually adept we humans are at understanding what others believe and what they are rationally thinking, and how good we are at the social understanding needed to maintain many social contacts. However, the importance of our affective empathy, or emotional attunement to others' feelings, and how we use it to understand how they feel about us, is often forgotten. This attunement to how others feel and why they feel this, rather than simply to what they think or believe, may have been far more important in our evolutionary past than we have recognised.

Clues exist today. Looking around us we can see a surprisingly complex attention and attunement to the hidden depths of other people's emotional lives.

We are much more sensitive to the emotions of people around us than we often imagine. As we have discussed in Chapter 1, how others around us feel affects us deeply. We are acutely sensitive to heroism, cruelty or even everyday kindness or harshness, for example (Keltner and Haidt 2003; Piper, Saslow, and Saturn 2015). Even just hearing about acts of genuine compassion or heroism can influence how we treat others around us and what

we believe about the world. Acts of generosity tend to spread to people down the line, as people feel differently after hearing about or witnessing them and ‘pay it forwards’ (Fowler and Christakis 2010). Moreover, we have extraordinary levels of biological attunement to each other – the heart rate and gamma brain wave oscillations of mothers and babies and couples even coordinate in tune with each other, as well as their emotions and movements (Feldman 2017).

More than this sensitivity, however, we pay great attention to what other people feel *about us*, or even *might feel about us*, and what their feelings might mean. We have remarkable abilities to make highly accurate inferences about other people’s intentions, even on the basis of the tiniest of facial expressions or slightest of other indications of what feelings are happening ‘behind the scenes’ in others’ minds.

There have even been many changes to the human face since our split with other apes which reflect our need to display our feelings and identify the feelings of others. These include the emergence of blushing and crying as signs of genuine emotions (Evans 2002), as well as changes in face shape and appearance (Bastir 2018; Godinho, Spikins, and O’Higgins 2018; Lacruz et al. 2019). We share a distinctive ability to both express and identify in others subtle expressions of vulnerability, sympathy or recognition through movements of our eyebrows, for example, discussed in more detail in Part 2.

Often without realising it, we constantly track the feelings and intentions of the people around us, and how they might behave (Thornton, Weaverdyck, and Tamir 2019). We may think we pay attention to what people do but, in fact, the hidden world of their feelings is often more important to us. Research confirms that we are much less swayed by the outcomes of people’s actions than we are by the emotional intentions behind them, for example (Yudkin, Prosser, and Crockett 2018). We may feel more positively inclined towards an elderly person who kindly gives sweets to a child than to someone wealthy who gives substantial funds to a major charity, even though the outcome in the former case may not be all that positive and, in the latter, may make a substantial contribution to people’s lives. We even feel more comfortable talking to a stranger who displays their caring nature

through owning a pet dog than we would if they were by themselves, for example (McNicholas and Collis 2000). By this small acknowledgement of their emotional need for a pet, they seem more trustworthy. Our complex pictures of the emotional motivations of other people even extends to how they treat not only other people or even animals but also inanimate things (discussed in Chapter 5).

The efforts our brains make, behind the scenes, to keep track of others' feelings and what they might mean extend into having profound effects on our long-term relationships. We may love our children unconditionally, or at least aspire to, but, in our adult relationships, how our friends, partners or other people important in our lives feel about us matters deeply. We keep extraordinary track of the motivations of people close to us through a constant set of mathematically founded assessments of their 'trust metric', or the extent to which we understand that they will act in our interests above theirs, for example (Gottman 2011). However much we value rationality in our business world, amongst our partners and friends we are unimpressed if they are not prepared to be irrationally driven to sometimes put our needs above their own when it matters for us (Jordan et al. 2016; Manapat, Nowak, and Rand 2013). Further, many micro judgements lie at the heart of long-term relationships. In these relationships, as we trust someone more, we become increasingly more willing to be generous, and more comfortable with giving to another person without expecting anything in return (Manapat, Nowak, and Rand 2013).

We start to make these judgements about what motivates other people from an early age, and they become so routine that we barely notice them. As we have seen in Chapter 1, these judgements begin in early childhood, when we are no longer duped by apparently kind acts but become much more aware of what feelings lie behind what other people do, and why they matter. This is the point when, even as young children, we help others *discriminately*, deciding how much effort to put in to help, or even whether to put in any at all, according to our estimate of the person needing help. From childhood, it is not sufficient just to track what others do. We also need to know what their underlying emotional motivations are. Even in the playground, we often make decisions to resist bullies and help those genuinely in need which may not be in our own immediate short-term interest.

We cannot help but wonder why we should devote quite so much time and effort to understanding what emotions lie underneath others' behaviour, and what they might mean.

We do share a certain sensitivity to others' motivations with many highly social animals. Chimpanzees, for example, can remember favours that have been done to them for at least six months (Schino and Aureli 2010). Domestic dogs make judgements about people who have either helped or refused to help their owners, and will not accept food from the latter (Chijiwa et al. 2015). Being a social animal involves being astute about how your fellows are behaving and how it might affect you. It also involves being able to handle emotions rather than immediately act on them, such as through overcoming the frustrations of having to share food, or controlling impulses to be aggressive (Green and Spikins 2020; Marshall-Pescini, Virányi, and Range 2015). However, our seeming obsession is different. Only humans build up a complex picture of the emotional motivations of people around us on the basis of a whole myriad of behaviours, not just those we see in front of us but also stretching into the past.

The unique problems faced by early humans may give us important insights into why trust became so important, and why we care so much about what lies behind what other people do and how they feel about us.

Why early human interdependence made a good reputation matter

As we have seen in Chapters 1 and 2, early humans from about 2 million years ago survived dangerous predators, brought up vulnerable young and found food because they *depended on each other*. Archaeological evidence demonstrates an increasing tendency to care for ill or injured adults as well as increasingly vulnerable and dependent children, alongside collaborative hunting of increasingly large and dangerous animals and sharing of food resources.

Early human groups at this point took a different pathway from other apes, as we discussed in Chapter 1. Non-human apes may be socially clever, but they are largely self-focused, with their main emotional bonds being between mothers and their offspring. However, early human communities needed to be far more collaborative to survive, and changes in emotional

connections are likely to have played a key role in enabling this. By being willing to be generous to others in their group, and to depend on others' generosity in turn, they will have been able to reduce their individual risks at a time of increasing environmental unpredictability (Grove 2011). Sharing hunting risks, food, infant care and caring for the ill and injured made human groups far more resilient to the vagaries of resource shortfalls, injuries or individual misfortune (Gurven and Jaeggi 2015). It was also in these collaborative contexts, where caring for others was key to bringing up vulnerable young, to finding and sharing food, and to looking after vulnerable adults, that the strength of our human emotional connections, and even love, emerged.

Two key transformations had to take place. Firstly, collaboration had to happen across the whole group, rather than just with particular allies as we see with chimpanzees (Figure 3.2). This meant that being a valuable and trusted group member began to matter (Tomasello and Vaish 2013). Secondly, the depth of collaborations, and the extent of give and take anyone might expect from others, had to increase. From calculated exchanges typical of other apes, early humans had to develop much more in-depth commitments, such as in taking risks to find resources or to defend the group from predators, or in shared care for vulnerable young (Figure 3.3).

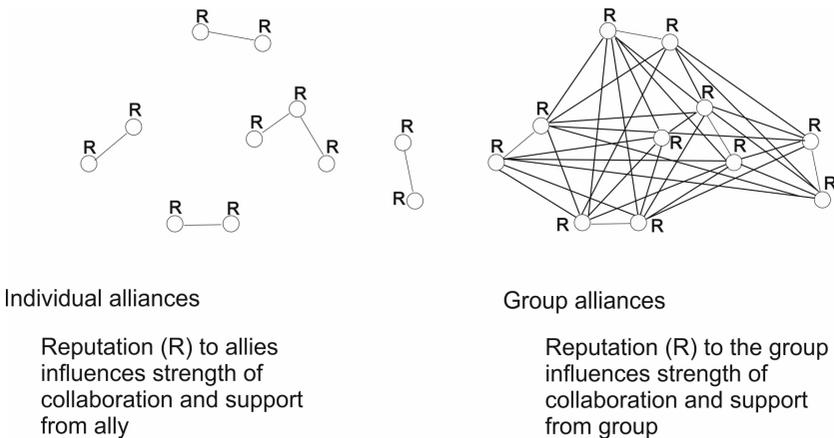


Figure 3.2: Judgements of reputation within peer-to-peer alliances are relatively simple (left) whereas within collaborative groups judgements of reputation with regard to many potential allies or even the group as a whole are far more complex (right). Penny Spikins, CC BY-NC 4.0.

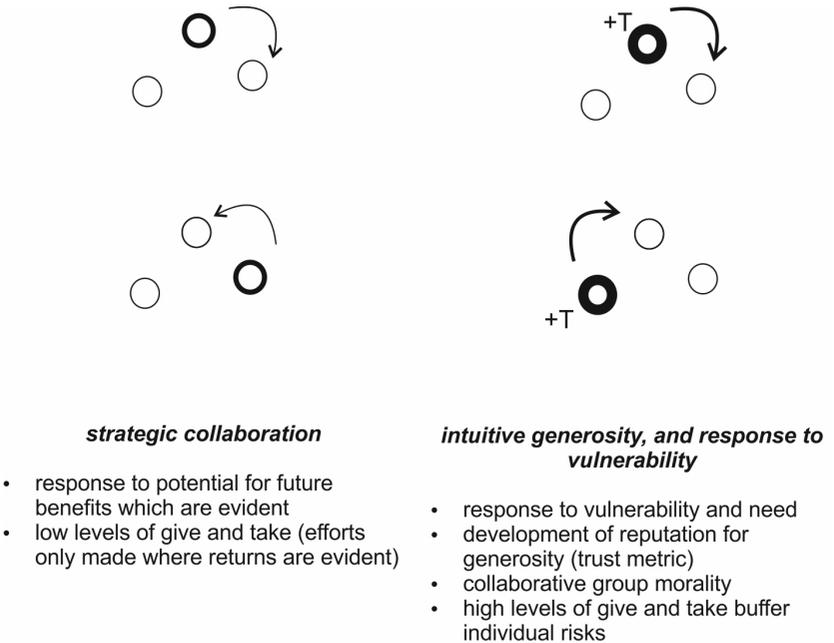


Figure 3.3: Relationships based on strategic selfish motivations (left) show lower levels of give and take (denoted by thinner lines) and lack trust (denoted by T) than those based on genuine caring and mutual generosity (right). Penny Spikins, CC BY-NC 4.0.

These transformations brought new levels of collaboration but, also, new problems. As we have seen in Chapter 1, whilst it makes simple adaptive sense to help out members of one's family, helping out non-family members depends on mutual generosity and some kind of assurance that one's efforts will be repaid, if not by that person then by someone else. Ancestral apes would be fully capable of deception, opening up possibilities for exploitation. The more interdependent people became, and the more survival depended on extensive 'give and take', so the more serious would be the consequences of being exploited. There are many situations where a small amount of help from someone who genuinely cares can make a big difference to survival, of which temporary illness or injury is just one example. But how could such help be ensured? Without laws or formal repercussions, what would stop a friend, mate or ally from abandoning someone with a serious injury in time of need?

Emotional commitments, fuelled by trust and abilities to discern who is or is not genuine, solve this problem (Spikins 2019). Genuine emotions act like an insurance policy, forcing other people to pay a price in terms of emotional pain if they do not act in the best interests of someone they care about. In this sense, emotions handcuff people to act on others' behaviours before their own, and vice versa should the situation be reversed. We all experience this most acutely when we talk about the effects of love, or scientifically phrased 'strong emotional bonds'. Love motivates us to sacrifice ourselves for someone else, and when something bad happens to them or we let them down *love hurts*. The extremes of joy and pain through our emotional connection to people we love create strong bonds, resilience to life's challenges and high levels of give and take. However, our tendencies to care can also be exploited, and the more we care about other people the more we are willing to sacrifice and the more we might lose. The more attuned we can be to identifying genuine motivations from fake ones, and at displaying our own genuine intentions, the better we can be at developing relationships based on mutual trust and so the better we are protected from deception or cheating. For this reason, early human interdependence brought with it selective pressures on displaying and identifying genuine emotions and tracking others' reputations, with genuinely caring about others working almost like a type of currency to ensure willing generosity from them in turn (Hoffman, Yoeli, and Nowak 2015; Jordan et al. 2016; Rand and Nowak 2013; Spikins 2015a).

The more important collaboration became to survival, and the more interdependent human groups became, the more important relationships based on trust and long-term emotional commitments were. This, in turn, meant that having, displaying and being able to identify genuine kindness became more important also. The potential for exploitation also became greater, of course. The need to express and identify genuine motivations, and the possibility of cheating and exploitation, can almost be seen like the escalation of an arms race, to which we credit both our capacities for love and our all-too-present concerns with who to trust and what others feel about us.

We can see the role of reputation affecting other people's emotional willingness to help all around us even today. Examples abound in modern

hunter-gatherers, as well as in our own society. Amongst the Martu of the Australian Western Desert, for example, the most genuinely generous hunters are the ones that are most favoured as hunting partners (Bird and Power 2015) and, amongst the Aché of Paraguay, the most genuinely generous hunters were most willingly looked after when ill or elderly (Gurven et al. 2000). It is easy to imagine that these judgements might simply be about actions but instead they rest on judgements of genuine feeling. Amongst the Jo'huansi of the northern Kalahari, for example, too large a gift is treated with suspicion – it might indicate that someone wishes to ingratiate themselves, rather than genuinely caring (Wiessner 2002). Our intuitive judgements about the feelings behind people's actions even affect who we find attractive. Even in Western industrialised societies, more altruistic men tend to be rated as more physically and sexually attractive and desirable as dates than those who are less altruistic (Jensen-Campbell, Graziano, and West 1995), and more genuinely altruistic people also have higher mating success over the long term (Arnocky et al. 2016). It is not *what people do* that matters in highly collaborative human groups but the hidden depths of *the emotional motivations underlying why they do it*.

We tend to imagine that early humans were cunning rather than kind but, perhaps surprisingly, in a climate of trust within small cohesive societies, genuinely caring about others can be a more successful strategy than just being socially clever. We may imagine that collaboration depended on being socially clever, but social astuteness alone does not foster effective collaboration. Strategic social thinking can add 'fuel to the fire' of competition, promoting unethical behaviour (Pierce et al. 2013) and enabling manipulation. Emotional motivations to care about others' wellbeing can be far more important to how people work together effectively than being socially clever (Smith et al. 2017; Stellar et al. 2017). Our willingness to punish those who cheat or who are exploitative also acts like a measure of 'policing' people who are manipulative or purely self-interested (discussed in Chapter 1). Moreover, it is not always an advantage to have more complex social thinking or theory of mind abilities. Higher levels of perspective-taking contribute to anxiety about what others are thinking and have been associated with psychosis (Brosnan et al. 2010). Further, when it comes to making friends, we are often more willing to trust people who do not delve too deeply into what others are thinking about them (Jordan et al. 2016; Spikins, Wright, and Hodgson 2016). Being too socially intelligent can backfire if others are focused on your trustworthiness and suspicious

of social astuteness. We may imagine a 'successful' early human as rather a self-centred and even cutthroat type of person, successful perhaps through their Machiavellian tactics, but such ideas are purely our own assumptions (Winder and Winder 2015). The nature of collaboration argues that being kind may have mattered much more to success than being cunning.

***Trust, emotional commitments and the price to pay
for caring about reputation***

Collaboration based on emotional commitments, rather than on simple agreements or loose alliances, may have been even more key to human evolutionary success than we imagine. Relationships based on trust meant that collaborative groups could hunt larger and more dangerous prey, as individuals would be willing to risk their lives for others and also to care for injured adults. It also meant that vulnerable young could take longer to reach adulthood, given the security of many adults to care for them, and so could learn more in the process.

However, there was a price to pay for a dependence on such relationships. Firstly, depending on the generosity of one's socially astute peers for one's own survival meant that the social and emotional world got a great deal more complicated. Secondly, an awareness of one's reputation in others' eyes brought with it emotional vulnerabilities that continue to plague us today.

There are costs in terms of brain power needed to keep track of who to trust. It takes a lot of cognitive effort to fully understand others' emotional motivations, or their emotional reputation, as this depends on building up a picture over many different moments, not just one individual instance. Without building up our understanding of someone else, we are easily duped by behaviours that appear to be helpful but may hide selfish or harmful intentions. Moreover, whilst chimpanzees only need to track peer-to-peer relationships (single sets of allies), people are also concerned with others' group morality, the extent to which they want to contribute to the wellbeing of the whole group (Tomasello and Vaish 2013). Understanding what someone's behaviour might mean about their intentions towards you is already complicated enough, but understanding what their behaviour means about their intentions and motivations with regard to the whole social group is even more complex.

There is good reason to argue that it was the *heightening stakes* on making the right decisions about who to trust that prompted selective pressures on a better understanding of what other people think or feel, including about each other (Hoffman, Yoeli, and Nowak 2015; Rand and Nowak 2013; Spikins 2015a). Quite simply, early humans needed to understand a great deal about what others thought and felt, not only about them but about everyone else, and to get better at building up a picture of others' feelings and actions over many instances. Moreover, these kinds of pressures may have been key to driving accelerated human intelligence and, as we have noted in Chapter 2, it may not be so surprising that even the smallest brained species of early human add enlarged brain areas responsible for social and emotional processing.

These heightened stakes also set the scene for painful emotions such as guilt or shame, which prompt us to adhere to moral norms. After all, painful though such feelings may be, people tend to trust us more when we are visibly guilty or ashamed for our transgressions. Our emotional self-punishment is difficult to fake, and provides some reliable evidence to others that we would find it hard to exploit them. These feelings hardly make our own lives easier, though, and can often become debilitating. The importance of reputation within our social relationships means that we are left with deep-seated concerns and vulnerabilities around what people think about us, and who to trust, making us vulnerable to shame and depression. It may be a price worth paying for deep-seated connections, kindness and support in hard times, but it is not an easy one.

The significance of trust, emotional commitments and a concern with reputation to key issues in human origins

The importance of trust, emotional commitments and reputation to early human collaboration may give us new insights into some of the key questions about our early origins.

Being kind rather than being cunning

We often base our interpretations on the assumption that people who were socially clever were the most successful in our evolutionary past, rather than

those who were emotionally kind or good at forging relationships based on trust.

It is not difficult to see why we have made this assumption. Our preconceptions about what must have been important for success may have played a role (discussed in the introduction to this volume). Moreover, drawing a straight line between our nearest relatives, chimpanzees, and ourselves may be another influence. As we have seen in Chapter 1, imagining our ancestors as existing part way along a continuum between non-human ape and modern human easily prompts us to ignore the importance of interdependence, emotionally based collaboration, and response to vulnerability to how early humans survived.

There are also other reasons why being socially clever, rather than kind, has been emphasised in our evolutionary origins. Evidence from changes in the size and shape of the human brain through time seem to point in the direction of increasingly large, and so socially challenging, human groups rather than small and cohesive ones. Social understanding or theory of mind abilities are key to keeping track of many individuals within the type of large-scale social network such as we imagine characterised an early human past (Lewis et al. 2011; Noonan et al. 2018). Increases in prefrontal (neocortex) size through human evolution, alongside comparisons with other species, were taken to imply a progression towards increasingly large human social networks (Lehmann and Dunbar 2009). On this basis, it appeared that selection pressures on the 'social brain' and so our abilities to manage complex social situations, drove expansions in human intelligence.

There are problems with the idea of increasingly socially intelligent humans adapted to ever larger social networks, however. Whilst neocortex size does increase throughout human evolution, this may not be primarily indicative of increasing group sizes, and with this the need to negotiate relationships with many people, but rather of a need to forge closer and more trusting relationships with a few.

Firstly, the relationship between neocortex size and group sizes has been called into question, with clear correlations difficult to identify (Lindenfors,

Wartel, and Lind 2021; Miller, Barton, and Nunn 2019). Secondly, there is little archaeological evidence for either large groups or large social networks prior to 300,000 years ago, and archaeological and genetic evidence more clearly support small close-knit groups rather than large complex social communities, as discussed in Part 2. An increasing neocortex size may have more to do with emotional understanding and social emotional relationships than with simply being socially complex. Theory of mind (understanding what other people think) and emotional understanding (affective empathy) use somewhat different parts of the brain (Stietz et al. 2019) but both involve increasing activity in the neocortex.

Social networks and social intelligence, in terms of keeping track of many people, may be a much less significant factor in our evolutionary history than we imagine. We can ‘keep track of’ many different relationships without these relationships necessarily having any real depth or significance in our lives. Some ‘relationships’ that involve theory of mind and perspective-taking do not involve any meaningful emotional interaction. For example, chimpanzees use their social abilities to pay close attention to the calls of neighbouring groups and what they mean about their politics (Sapolsky 2017), paying more attention to socially surprising sounds (such as submission by a dominant individual to a lower-ranking one) (Figure 3.4). Ravens use their social intelligence in the same way (Massen et al. 2014). In each case, this demands social cognitive complexity. In similar ways, in modern societies we use our social competence to keep track of relationships between pretend characters, which feel like they are real but are similarly not a meaningful part of an alliance network (Lather and Moyer-Guse 2011). None of these relationships provides allies who are there when needed.

If we redress the balance and take on board the significance of trust, emotional commitments and reputation to our human origins, we may contribute to several key debates – from early cultural transmission knowledge to the explanations for a concern with aesthetics to the mechanisms promoting inclusion of different minds into early societies.

Reflecting on the cultural transmission of knowledge

Most authors agree that the capacity to pass on knowledge from one generation to another, or cultural transmission, is a significant evolutionary step in our origins. However, in terms of explaining this important transformation,



Figure 3.4: A group of chimpanzees at Kibale National Park, Uganda, stop near the boundary between groups and listen carefully to the calls within their neighbouring group for several minutes before moving on. Photo copyright John Mitani, reproduced with permission.

we have tended to focus on the role of capacities for social communication, including language.

There has been a tendency to assume that teaching and learning are primarily about effective communication. From this perspective, passing on knowledge from one generation to another comes about through being able to communicate that knowledge effectively, both technically in terms of language and socially in terms of understanding of how others think. However, cultural transmission of important innovations and knowledge may be one example of the often-underestimated role of trust and emotional commitments. Emotional dispositions and abilities may be more critical to learning and teaching of skills than we imagine.

Abilities to teach new skills to others (particularly stone tool production) have been related to perspective-taking capacities (Shipton 2010). However, emotional motivations towards others' wellbeing may be as much, if not more important, in learning. There is good reason to suggest that

motivations to teach skills and a sense of safety needed to learn are most dependent on emotional connections, rather than cognitive skills. Those social species that are most collaborative and most emotionally motivated to care about offspring seem most disposed to teach skills to their young, rather than those that are most socially or cognitively clever. We might expect our nearest relatives, the chimpanzees, with the highest non-human theory of mind abilities, to be the most adept at teaching skills to the young. However, young chimpanzees typically learn only by copying adult behaviour rather than by being actively taught. It is amongst far more distantly related collaboratively breeding tamarins that we see evidence of teaching, including vocalisations, amending food transfers according to skills and sculpting of behaviours (Snowdon 2011). Cooperatively breeding meerkats may not technically be clever but they teach foraging skills to the young, such as by stunning scorpions to allow young to learn how to kill them (Thornton and McAuliffe 2006). Moreover, bonding hormones play a key role in this activity. Increasing levels of oxytocin in meerkats cause increased efforts to teach skills (Madden and Clutton-Brock 2011). On a phylogenetic level, teaching appears to be more associated with cooperative breeding and emotional motivations to care for other group members than theory of mind (Thornton and McAuliffe 2015).

Changes in emotional dispositions as early humans become more collaborative may have had a far greater impact on facilities to learn new skills and pass on cultures than we think. We have tended to assume that more complex technology associated with the origins of *Homo*, which must have been taught across generations, was a product of increasing social understanding, more complex theory of mind abilities, and so abilities to teach others, for example. Changing emotional dispositions, affecting motivations to share knowledge, may have been equally, if not more, important.

Reflecting on the influence of emotional reputation on attention to the aesthetics of artefact form

The importance of emotional commitments may also cast light on questions of the earliest concern with aesthetics and symmetry.

Of all artefacts, it is perhaps stone tools that we most tend to associate with being purely functional. However, even these artefacts may demonstrate

quite how sensitive our complex emotional brains were, even as far back as nearly 2 million years ago.

It is handaxes, or bifaces, in particular that have attracted attention for their potential to inform us about early human emotional capacities. Handaxes begin to appear in the archaeological record after 2 million years ago, alongside increased meat eating. They were almost certainly largely used to butcher meat, remaining in use for over a million years. Research into the form of handaxes or bifaces argues that these carefully formed stone tools may demonstrate a certain sensitivity to reputation in their construction (Green and Spikins 2020; Spikins 2012). Attention has been drawn to these artefacts as they demonstrate a concern with symmetry and the aesthetics of form in their construction, usually complying with what appears to be a mental template of what a finished tool ought to look like in terms of a typical teardrop symmetrical shape (Figure 3.5).



Figure 3.5: Photograph of a handaxe or biface from Olduvai, dated to around 1.2 million years ago, illustrating attention to symmetry and the pleasing aesthetic form of these artefacts (on display in the British Museum). Johnbod, CC BY-SA 3.0, via Wikimedia Commons: https://commons.wikimedia.org/wiki/File:Olduvai_handaxeDSCF6959.jpg.

Two particular characteristics of bifaces suggest that they may have played an important role as signals of genuine emotional motivation. Firstly, by imposing an aesthetically pleasing symmetry on an artefact that may be used by others, early humans may have been demonstrating their other-focus – the extent to which the feelings and wellbeing of those around them demonstrably mattered to them. Secondly, early humans may also have been signalling their abilities at inhibitory control, or overcoming frustration (Green and Spikins 2020; Spikins 2012). Certainly, it is far more difficult to impose a preconceived form on a stone tool than simply to create a sharp edge. Imposing the classic teardrop shape of a biface a flint core demands considerable inhibitory control (or what we might more prosaically call patience or self-control).

Both of these capacities are plausibly important to collaborative social relationships and liable to others' judgements. Any species that becomes more socially collaborative also needs to develop increased inhibitory control – the capacity to withstand motivations to act, particularly in one's own interests. We use inhibitory control, or patience, when we share food rather than 'giving in' to the temptation to eat it all ourselves. Being able to act prosocially in response to others' needs demands not only empathy but also inhibitory control – our capacity to handle emotions. When we see someone in pain, for example, we feel an empathetic response, particularly if we care about them. Without being able to exert some self-control over our emotions, our own empathetic feelings can be overwhelming. Feeling empathy only leads to compassionate helping behaviour if we can handle difficult emotions and overcome tendencies to simply act impulsively.

Evolved capacities for impulse control (self-control/inhibitory control), or more prosaically patience, vary between different species, as well as according to any animal's experiences. Sometimes, evolved selective pressures to handle emotional impulses arise simply from the type of resources different animals exploit. Predators need inhibitory control to resist temptations to 'pounce' until the right moment, for example. There can also be subtle pressures that influence differences between closely related species. Amongst New World monkeys, for example, common marmosets depend on exploiting sap that oozes slowly from trees and are more 'patient' than cotton top tamarins, which more predominantly exploit quick-moving insects, requiring greater impulsivity (Stevens, Hallinan, and Hauser 2005).

For highly social animals, getting along with others often demands a need to withstand immediate impulses, such as desires to snatch food from others, to hit back or even to run away. Social-living primates, such as our nearest relatives, chimpanzees and bonobos, typically show high levels of self-control, for example. Chimpanzees and bonobos are able to wait for a greater food reward rather than impulsively take what is immediately on offer, suggesting comparable abilities in our shared ancestor (Rosati et al. 2007). Social carnivores are particularly adept at impulse control as they depend so intimately on high levels of collaboration for survival (Marshall-Pescini, Virányi, and Range 2015). Wolves are able to share food, which entails withstanding the frustrations of being hungry themselves in order that those they care about can eat (Dale et al. 2017). Moreover, although conflicts erupt often in wolf packs, actual violence is rare, with impulse control allowing wolves to focus more on a reprimand and typically stop short of actual serious harm (Marshall-Pescini et al. 2017). In social mammals, play performs an important function in fostering emotional regulation, providing an arena to safely practise frustrations (Bekoff 2001; Linsey and Colwell 2003; Palagi et al. 2016). In chimpanzees and bonobos (Palagi 2006) and wolves (Cordoni 2009), as well as in humans, social play extends into adulthood.

Self-control in humans shares similar features to that in other animals (Miller et al. 2010). However, we also have extra levels of emotional regulation. We can also draw on our conscious self-awareness of how we feel, and our capacities to label (or 'tame') our feelings, as well as being able to use conscious strategies to resist temptation (Hobson 2002). By bringing our emotions into awareness, sharing them with others, and rationalising and reframing our emotional experience, we can use our gut feelings as well as our rational thinking to make decisions (Damasio and Dolan 1999).

Capacities for self-control and emotional regulation have far-reaching influences on human lives, affecting social relationships, achievement, and propensity to anxiety and depression (de Ridder et al. 2012; Joormann and Gotlib 2010; Tangney, Baumeister, and Boone 2004), and predicting academic performance better than IQ (Duckworth and Seligman 2005). Higher-level controls on impulses also make it possible to delay gratification over considerable timescales, for example saving money today for a pension many decades in the future. More than this, however, our abilities to withstand being carried away by our emotions allow us to translate the intensity of feelings we have for those we love to help them in pain, loss and grief.

Though it takes extra effort and inhibitory control to overcome the frustrations involved in imposing symmetry on the form of a biface, given the significance of demonstrating one's genuine motivations, this 'costly signalling' would almost certainly pay off in terms of fostering stronger social bonds (Spikins 2012). In modern, highly collaborative societies, material displays of genuine generosity and inhibitory control in giving away food even when hungry have been shown to have rewards in later life through the willingness of others to help at times of illness or infirmity (Gurven et al. 2000). Conversely, material displays of impulsivity, at least in adults, are typically treated with a certain disdain and loss of status, as seen amongst the Inuit (Briggs 1970). Almost everything we do betrays how we feel, and the way in which we create and use objects around us is no different. Whilst we tend to focus on how more complex stone tools, such as handaxes, gave early humans who used them a technological advantage over other hominins, their ability to display subtle messages about generosity or trust may have been equally if not more important. Not only can subtle messages in the creation and use of material things send signals about positive reputation; they may also perform a role as signs of comfort, safety and familiarity that might promote physiological safeness and increase confidence to explore (discussed in Chapter 7).

Of course, there may be far more to handaxe symmetry than simply displaying positive emotional capacities to others who were sensitive to such indicators. Certainly, an irrational concern with the aesthetic form of bifaces has been a source of much debate (Gowlett 2011; Gowlett 2020; Hayden and Villeneuve 2009; Hodgson 2015; Kohn and Mithen 1999; Lycett 2008; McNabb and Cole 2015; Nowell and Chang 2009; Wynn and Gowlett 2018). Nonetheless, much like cave art many thousands of years later, it is clear that these subtle signs of inner emotions can have powerful influence.

A sensitivity to moral reputation may also be part of social processes that fostered the inclusion of diverse cognitive styles in the evolutionary past.

***Reflecting on a sensitivity to emotional motivations and the
integration of different minds***

An understanding of the significance of relationships based on trust and of judgements of reputation may also contribute to our understanding of the mechanisms driving inclusion of people with different minds within societies.

As we discussed in the introduction to this volume, all too often we impose an idea on the past of there being a simple progression in human evolution from one individual being to another, when the real story is far more complex. We know that human populations are not really many examples of a single 'ideal' mind but are made up of many different minds that work together, but we easily forget this when we discuss our evolutionary past. The concept of a progressively better individual through time tends to easily suppress our understanding of the significance of diversity to human evolutionary success.

One particularly important example of how the interaction between different minds may have contributed to our evolutionary history comes from research on autism. Few people fit into the mould of having what we might think of as a 'normal' mind, and the differences associated with autism present us with one of the most interesting, important and hotly debated areas of cognitive difference.

Definitions of autism have changed over the years. Nonetheless, there is a general consensus that people who we say have an autism spectrum condition (ASC) tend to display a constellation of traits related to how they perceive the world and their social perception. Individuals with ASC tend to lie at the extreme of perceiving and thinking in terms of high levels of detail (Happé and Frith 2006), and in terms of rules and systems rather than intuitive understandings (Baron-Cohen and Lombardo 2017). Their strategic social thinking is limited, and they tend to have only low levels of theory of mind (being more likely to fail at the level of second-order theory of mind, i.e. 'Y believes that X believes this'; Baron-Cohen 1989). Whilst, in the earliest cases of autism, the term implied a highly debilitating condition, today only about 30% of cases of ASCs are associated with intellectual impairment (Iosifov et al. 2014). Autism without intellectual impairment is more common, and is often seen as more of a difference than a disability, bringing with it both talents and vulnerabilities (for a more detailed review, see Spikins 2009; Spikins, Scott, and Wright 2017; Spikins, Wright, and Hodgson 2016; Wright, Spikins, and Pearson 2020).

For many years, it was assumed that autism was simply a disorder, and that autistic individuals would not have survived in the societies of the far-distant past (Bednarik 2013; Bednarik 2016; Pickard, Pickard, and Bonsall 2011). However, relatively recently genetic evidence has proved that this

assumption was wrong. Some of the variants of genes associated with traits related to autism are present across primates, being identified in macaques, for example (Yoshida et al. 2016). Autistic traits have also been recorded in chimpanzees (Faughn et al. 2015). Autism seems to be an essential part of that evolvability of the human gene, that is, its capacity to adapt. Moreover, autism has been subject to positive selection (Polimanti and Gelernter 2017) and there also seems to be a proliferation of genes associated with autism in relatively recent evolution (Nuttall et al. 2016). Not only were individuals with ASC present in the past, but there appears to sometimes have been certain advantages to the condition.

We will probably never identify any individual archaeological artefact made by someone who we would now identify with ASC. However, there are some clues as to the involvement in Palaeolithic societies.

How individuals with ASC interact with the material world around us today show subtle differences (Spikins, Scott, and Wright 2017; Spikins, Wright, and Scott 2017; Wright et al. 2021). A far greater percentage of individuals with ASC today have extraordinary talents in realistic depiction as a direct result of their enhanced detail focus, for example (Spikins, Scott, and Wright 2017). Extraordinarily talented autistic artists are well known; however, a tendency to show greater talent in realistic depiction is seen across the whole population of individuals with ASC. Furthermore, individuals with ASC tend to be drawn to creating and owning highly technological objects and ones made with a high degree of precision, a trait that enhances their abilities to produce highly specialised technology (Spikins and Wright 2016; Spikins, Wright, and Hodgson 2016).

A focus on technology and detail may have been particularly important to the ability of past hunting and gathering populations to survive in cold and highly risky environments. As we see in the modern Inuit today, complex technology is essential for survival in such situations. In these particular contexts, of which Ice Age Europe is a particularly good example, the skills associated with autism may have been particularly valued. Similarities between highly realistic depictions in European Upper Palaeolithic art and that of talented autistic artists today are probably explained by the involvement of autistic individuals in producing some of the art but also,

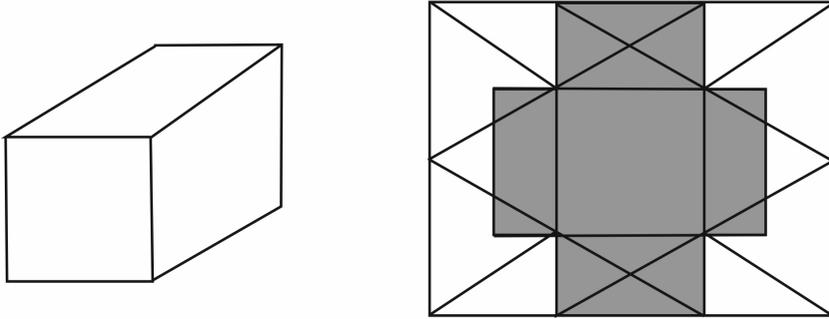


Figure 3.6: Example of an embedded figure test. Individuals with ASC have superior abilities at identifying the shape on the left within that on the right. Penny Spikins, CC BY-NC 4.0.

perhaps more importantly, influencing the style of art (Spikins, Scott, and Wright 2017).

Given that we know that autistic individuals were present in the Palaeolithic past, and able to make a contribution, the question then becomes: why and how were autistic individuals integrated into past societies?

There are many potential advantages to the inclusion of individuals with autistic talents. ASCs are associated with elevated abilities in various domains. These include visual perception (perception of detail, identifying hidden figures; see Figure 3.6), focus, pitch, smell and taste detection, as well as social skills such as an unemotional response to crisis and concern with fairness (see Spikins, Wright, and Hodgson 2016).

Many autistic people have remarkable talents in particular domains. In studies of over 250 autistic individuals, Meilleur, Jelenic and Mottron (2015) found that over 60% had some special skills. These ‘savant talents’ occur in several realms, including computational (listed as ‘easily able to multiply two numbers in the millions together in head; can tell the elevation of both the sun and the moon at any time on any date without reference to any book’), calendrical (‘could tell people what day of the week their birthday would occur and what day of the week they were born on’), memory (‘a few years ago, he was bought a book which was read to him; this year we read it to him again after over a year – if we stopped he would finish the rest of the

sentence quite accurately') and visuospatial abilities ('successful in painting portraits of friends, friends' children and selling them') (Howlin et al. 2009).

Strategic social thinking is not always important to being successful. In a study of 840 Cambridge University students, around 2% scored in an autism quotient range suggestive of having ASC (Baron-Cohen et al. 2001). As Baron-Cohen comments,

None of those meeting criteria complained of any current unhappiness. Indeed, many of them reported that within a University setting their desire not to be sociable, together with their desire to pursue their narrow or repetitive interests (typically mathematics and computing) was not considered odd, and was even valued. (Baron-Cohen et al. 2001: 12)

Our own research has demonstrated the same pattern in students at York (Spikins, Wright, and Hodgson 2016), as well as how the different perception and skills of autistic individuals are reflected in unique forms of art (Spikins, Scott, and Wright 2017), particular preferences for cherished possessions (Spikins, Wright, and Scott 2017), and certain attributes of the built environment (Schofield et al. 2020). Rather than there being a single human mind, society is in reality a *balance of minds*.

Although there may be challenges to the integration of autistic individuals, it is not difficult to see that some of these abilities could be a real advantage in realms such as hunting, medicine or technology. Such advantages might even particularly be important in cases of environmental unpredictability, when being able to quickly develop new technologies or exploit new resources may have been vital to survival. Technological abilities may even have provided the potential for specialised roles, such as around the production of elaborate and highly detailed technologies.

Were autistic individuals integrated into prehistoric societies *because of* their talents? An understanding of the significance of emotional motivations adds a new perspective to this debate. As we have seen above, when we make judgements of others, we tend to focus on the emotional motivations behind their actions – whether they intended to help others or not. An explanation for the integration of autism should probably look beyond

simply behaviours and abilities to emotional motivations, and the motivations of autistic individuals to make a contribution to group wellbeing, albeit perhaps in subtly different realms.

Motivations to help others are not affected by ASC per se (that is to say, individuals with ASC are as likely to be motivated to act for the common good as are individuals who are neurotypical). Whilst empathy for complex emotions may be impaired in autism, empathy for pain remains intact (Hadjikhani et al. 2014). Most autistic individuals are highly motivated to make a contribution, albeit often in particular realms such as law or medicine or justice (Spikins 2009; Spikins, Wright, and Hodgson 2016). For this reason, the emergence of group judgements based on genuine emotional motivations (collaborative morality) and around contributions to the group interests seem likely to have been an important part of the process whereby autistic individuals became an essential part of the balance of human societies.

Particular roles for autistic individuals may have been most evident in the later phases of human evolution (discussed in Part 2), potentially as part of a process that includes occupation of high latitudes, and larger group sizes in which specialised roles become more sustainable. However, the inclusion of autism is discussed here as the primary driver for this process seems not to be strategic skills that autistic individuals may possess, but rather their shared human capacity to think about the wellbeing of the group above their own.

There is almost certainly more to understand, and disentangling the mechanisms and reasons behind the inclusion of autism into human societies may continue well into the future. There are, after all, a number of complexities to this issue. It would be rather convenient for our understanding if genes simply mapped onto autism, and yet this quite clearly is not the case. The actual situation is frustratingly complex. Not only are there over a thousand genes that show some association with autism but also the relationship between gene variants and autistic traits is certainly not a simple one. Moreover, there are complex issues such as epigenetic factors, that is, the potential effects of environmental conditions on the expression of particular genes. Neither is the presence of any particular difference within populations necessarily any indication that it was selectively advantageous; simply not making a

difference can be enough, as is often the case with hair or eye colour. As we shall see throughout this volume, we can construct a speculative explanation for why evolutionary changes took place, but may never entirely understand whether our perfectly plausible explanation is the right one. At best, we hope we are getting nearer to the truth.

We can be confident that autism is not outside of the human evolutionary story but is very much part of what makes us human. Certainly, the condition deserves to be seen in terms of its positive attributes, as well as the challenges it may impose (Wright, Spikins, and Pearson 2020).

Rethinking our societies of the past as ones in which feelings, motivations and sensitivities to others were centre stage may help us better understand the changes taking place.

Further questions

Many questions remain. We have seen through the three chapters in Part 1 of this volume that ecological changes after 2 million years ago, and opportunities to move into new niches involving greater meat eating and collaborative hunting, placed new selection pressures on human emotional responses. Increasing interdependence placed selective pressures on group members to care more deeply about each other, and in long-term ways.

As a result, we share emotional motivations to share with and care for others in our group with other highly social and collaborative animals. However, for all the similarities, our human emotional connections, in particular our long-term commitments and the importance of trust in our relationships, are markedly different to those of other animals. We can recognise that our human reliance on emotional commitments has its roots in the complex social brain of an ape placed under pressure to collaborate in more in-depth ways. Yet there is also much more to understand about the timing and mechanisms underlying the significance of trust and reputation to human emotional connections.

There is also more to understand about who is cared for, trusted and included. Here we have focused on the inclusion of different minds within close kin and living groups. But what about the inclusion of strangers or

people who are different or unfamiliar in other ways? To address this question, in Chapters 4 and 5 we turn our attention to the evolution of increasing tolerance towards those outside of our familiar living groups. Beyond the question of other people, however, lies that of other animals, or of even things with which we develop strong emotional connections. These are topics we turn to in Chapters 6 and 7.

What about competing pressures towards self-interest? It would be foolish to portray human societies as wholly driven by motivations of generosity and trust. Rather, there seems to be a balance, both at an individual and a social level, between pressures towards self-interest or exploitation of others, and those towards generosity, sharing or compassion. A complex dynamic exists between our emotional desires to share and care and those to hold and control (Gilbert 2021). In climates of trust, it may pay to be genuinely kind, but there are highly competitive climates in which it pays to be cunning or exploitative. Both contexts may have existed in a certain equilibrium within past societies, or even have been expressed differently in alternative evolutionary pathways in the past. The developmental influences on this dynamic, and its implications for the future, are discussed in more detail in Chapter 5.

There are also many other issues that remain to be explored and for which this discussion is merely a starting point. Our capacities for emotional commitments themselves bring their own constraints, for example. Close-knit collaboration brings a cost in terms of tendencies to look inwards rather than out, and may have restricted the capacity of human groups to make large-scale connections until at least 300,000 years ago. Different evolutionary branches with different types of emotional connections are likely to have existed, as explored in Part 3. Moreover, emotional commitments have a darker side. The same loyalties and a willingness to take risks on behalf of others and to make great sacrifices for the sake of the group can also motivate some of the darker elements of human nature, including wars, feuds and vendettas. There is some evidence that conflicts may even have been important in human dispersal events after 100,000 years ago, for example (Spikins 2015b).

For all that love and trust are some of our human characteristics that we most applaud, there is much more that might be said about the negative side of human loyalties. The drives to defend loved ones and to make

sacrifices on the behalf of others play an important role in much of human war and suffering (Spikins 2015a). We may have only scratched the surface of what might be discussed, discovered or explored.

Wired for trust?

Perhaps we have at least begun a journey towards uncovering evidence for the significance of kindness, trust and emotional commitments in our shared origins. Our understanding of our long evolutionary history of living in close-knit communities connected by warmth, trust and interdependence may also cause us to begin to reflect on the mismatch between today's societies and our evolved make-up. In this light, we may be less surprised that an education system based on competition, judgement and a focus on quantifying merit fuels an epidemic of mental ill health amongst the young. Equally, the causes of high rates of depression in the context of rising inequality and declining social trust may be easier to explain. In beginning to resolve these issues, and to develop the type of society structures that promote better emotional connections and support the caring side of our natures, we might be helped by a more accurate narrative of what made humans successful as a species than one that emphasises cunning and self-interest above caring and community.

Conclusions

Our acute sensitivity to the feelings underlying other people's actions seems most likely to stem from increasing pressures on early humans to be ever better at judging who they could safely trust. From here, we began a journey towards extraordinary attunement to others' emotions and concerns as to how we might appear to others.

A focus on changes in our emotional brain, rather than on more strategic social intelligence, explains how strong bonds relying on mutual generosity fostered survival through challenging environments. It also provides insights into archaeological questions of changes in teaching and learning, the integration of different minds, and attention to the aesthetics of stone tools. Rather than intelligence or social understanding, it may have been changing emotional motivations that allowed more effective collaboration and made changes in intelligence, social complexity and cultural transmission possible.

Other changes taking place over the last 300,000 years, alongside pressures to look beyond familiar local allies, added further fuel to changes in social sensitivity, needs for belonging, and motivations to be likeable, as discussed in Part 2.

Key points

- Changes in affective empathy and in our emotional attunement to others may have been a more significant factor in human social evolution than developments in social thinking skills. Furthermore, rather than strategic social astuteness, displaying genuine emotional motivations towards others and being sensitive to genuine emotions in those around us may have played a greater role in evolutionary success than we imagine.
- Archaeological evidence suggests that a *sensitivity to moral reputation*, the pattern of emotional motivations towards others someone expresses over time, emerged after 2 million years ago, as seen in a concern for symmetry and aesthetics in stone tool form. Furthermore, later developments in the significance of genuine emotional motivations to group wellbeing, and collaborative morality, may have provided a basis for the cultural transmission of knowledge and for the inclusion of different minds within human populations.
- Our human emotional minds developed through compromises between strengths and vulnerabilities. Collaboration based on trust and emotional commitments came at the cost of individual sensitivities to what others think or feel about us.

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