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Language and symbolic culture: an outcome of hunter-gatherer reverse dominance

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> Symbolic culture . . . requires the invention of a whole new kind of things, things that
> have no existence in the 'real' world but exist entirely in the symbolic realm.
> Examples are concepts such as good and evil, mythical inventions such as gods
> and underworlds, and social constructs such as promises and football games.
>
> Philip Chase (1994: 628)

From a Darwinian standpoint, 'symbolic culture' is an unsettling notion. Modern science became established in opposition to the idea that culturally accepted fictions can be equated with facts. Yet the concept of symbolic culture requires us to grasp just that paradoxical possibility. Long before the late twentieth century invention of the Internet, evolution allowed humans to flit between two realms: reality on the one hand, virtual reality on the other. Symbolic culture is an environment of objective facts—whose existence depends entirely on collective belief. To use language is to navigate within that imagined world.

17.1 Two kinds of fact

'Brute facts', in the terminology of John Searle (1995: 27), are facts which are true anyway, regardless of human belief. Suppose you don't believe in gravity: jump off a cliff and you'll still fall. Natural science is the study of facts of this kind. 'Institutional facts' are fictions accorded factual status within human social institutions (see Wyman, Chapter 13). Monetary facts are fictions of this kind. The complexities of today's global currency system are facts only while we believe in them: suspend the belief and the facts

correspondingly dissolve. Yet although institutional facts rest on human belief, that doesn't make them mere distortions or hallucinations. Take my confidence that these two five-pound banknotes in my pocket amount to ten pounds. That's not merely my subjective belief: it's an objective, indisputable fact. But now imagine a collapse of public confidence in the currency system. Suddenly, the realities in my pocket dissolve.

For scholars familiar with Rousseau, Marx, or Durkheim, none of this is especially surprising or difficult to grasp. Some facts are true anyway, irrespective of human belief. Others subsist in a virtual realm of hallucination or faith. For Saussure (1983 [1915]: 8), it was the parallel between linguistic meanings and currency values—all in some sense hallucinatory—which made a scientific linguistics so problematical:

> Other sciences are provided with objects of study given in advance, which are then examined from different points of view. Nothing like this is the case in linguistics . . . The object is not given in advance of the viewpoint: far from it. Rather, one might say that it is the viewpoint adopted which creates the object.

It was in rebellion against such troubling notions that Noam Chomsky (2000: 106–33) redefined 'language and similar phenomena' as 'elements of the natural world, to be studied by ordinary methods of empirical enquiry'. Linguistics, within Chomsky's new paradigm, ceases to be social and becomes natural instead. Ideologically hostile to Marx, Durkheim and what they termed 'Standard Social Science', a generation of Darwinians (Tooby and Cosmides 1992, 1995; Pinker 1994) embraced Chomsky's 'cognitive revolution'. Somehow, language had now to be explained as an innate cognitive module without biological precedent, emerging suddenly and without reference to anything social (e.g. Hauser et al. 2002; Fitch et al. 2005). The consequence of all this was to render language's very existence an insoluble mystery (Knight 2004, 2009). Far from yielding to Darwinian explanation, the evolutionary emergence of language is nowadays increasingly considered 'the hardest problem in science' (Christiansen and Kirby 2003). Is it theoretically possible that the difficulties stem largely from our own culture-specific assumptions? If so, it might be a good idea to try abandoning them as a preliminary intellectual step. Among other things, I think we must abandon Chomsky's foundational insistence that language is a biological entity located in the head.

17.2 Four positions on the origins of symbolic culture

Within the past two decades, archaeological revelations from the African Middle Stone Age have transformed our picture of the timing of symbolic culture's emergence. Until the early nineties, the prevailing view of the 'human revolution' (Mellars and Stringer 1989) was unfortunately Eurocentric, focused as it was on the Upper Palaeolithic Revolution conceived as humanity's 'Great Leap Forward'. Recent discoveries from Africa have at least doubled the time-depth of probable or at least possible evidence for symbolic activity. This has left us with four main archaeological positions:

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17.2.1 *Francesco D'Errico*

Multispecies transition across Africa and Eurasia. Symbolic capacities already in place with *Homo heidelbergensis* 300,000–400,000 years ago. Sporadic behavioural expressions of symbolism occurring simultaneously among ancestors of both Neanderthals and ourselves (D'Errico 2003).

17.2.2 *Sally McBrearty and Alison Brooks*

Down with the revolution! African ancestors of modern humans undergo gradual, sporadic build-up of modern cognition and behaviour spanning 300,000 years. Symbolism presents no special theoretical difficulties, emerging as part of the package of modern, flexible, creative behaviours within Africa. What archaeologists once termed the 'human revolution' in Europe had nothing to do with the origin of symbolism. It was the collision of two species, one of which (modern humans originating from Africa) had gradually developed symbolism prior to reaching Europe, while the other (Neanderthals in Eurasia) produced little evidence of symbolism (McBrearty and Brooks 2000; McBrearty 2007).

17.2.3 *Christopher Henshilwood and Ian Watts*

There was a human revolution but it occurred well before the Upper Palaeolithic in Europe, being inseparable from the process of modern human speciation in Africa (Mellars et al. 2007). Evidence in the form of cosmetics and personal ornamentation is the archaeological signature of this African Middle Stone Age transition. Emerging at this time, symbolic culture was not an optional extra; life following the transition was fundamentally organized through symbols (Henshilwood and Dubreuil 2009; Watts 2009; Watts, Chapter 16).

17.2.4 *Richard Klein*

Recent interpretations of the African Middle Stone Age record are wrong; the original 'human revolution' theory remains correct. Middle Stone Age humans evolving in Africa may appear anatomically modern, but did not become cognitively modern until the Late Stone Age/Upper Palaeolithic. Language and symbolic culture emerged no more than 50,000 years ago, caused by 'a fortuitous mutation that promoted the fully modern brain' (Klein 2008: 271).

17.3 The archaeological evidence

In the African archaeological record, the earliest persuasive evidence for symbolic culture includes certain engraved pieces of ochre (Henshilwood et al. 2002) associated with marine pierced shells (Henshilwood et al. 2004; d'Errico et al. 2005). Dated to around 70,000 years ago, these were recovered from Middle Stone Age levels at

Blombos Cave, South Africa. Mounting evidence for symbolic behaviour at still earlier dates includes a South African coastal site (Pinnacle Point) yielding mollusc remains, bladelets, and red ochre pigments dating to at least 164,000 years ago (Marean et al. 2007). Use of ochre pigments extends back between 250–300 kya at some sites in the tropics; regular and habitual use dates back to the time of modern speciation (Watts 1999, 2009).

Most archaeologists now accept that the Blombos and other shells and pigments were used for personal ornamentation. Often, the shells were strung together to form a necklace. Traces of red pigment have been found on a set of 82,000-year-old perforated shells from the Grotte des Pigeons in North Africa, suggesting that the wearer's body may already have been ochred (d'Errico and Vanhaeren 2009: plate 2). Traces of red ochre pigment have similarly been found on some shells from Blombos in South Africa (d'Errico et al. 2004). Several modified pieces of ochre from the same site have a sharp bevelled edge, as if designed to produce a clear outline of colour on a surface (Watts 2009: plate 4). Ochres yielding the most saturated dark reds—especially 'blood' reds—were subjected to the greatest intensity of grinding and use (Watts 2009). Pinnacle Point nearby yields similar 'crayons' dated to *c.* 164,000 kya (Marean et al. 2007). Geometric engravings found on Blombos pieces (Henshilwood et al. 2002) add to the suggestion that many of these delicately shaped 'crayons' were used to produce blood-red abstract designs, presumably on the human body (Watts 2009). This cultural tradition can be traced back to at least a hundred thousand years ago (Henshilwood et al. 2011). Such evidence suggests that cultural traditions involving body painting were already being established with the speciation of *Homo sapiens.*

17.4 Explanatory scenarios

To Christopher Henshilwood and Benoit Dubreuil (2009), the cosmetic evidence indicates that Middle Stone Age people were capable of symbolic communication. For individuals to wear cosmetics or a necklace, they must care about how they look. To adorn yourself appropriately, you must imagine your appearance from the standpoint of others. The requisite capacities for multiple perspective taking are distinctively 'modern' and underlie all symbolic communication including language. Henshilwood and his colleagues on that basis conclude that the producers of the Blombos pigments and ornaments had language-ready minds.

Ian Watts (2009; Watts, Chapter 16) arrives at similar conclusions concerning language, but on different theoretical grounds. Since my own theoretical position converges closely with that of Watts, and since we both support Camilla Power's Female Cosmetic Coalitions model (see Power, Chapter 15), I will avoid repetition at this point and turn directly to Richard Klein, who is the main archaeological

opponent of the idea that African Middle Stone Age findings from sites such as Blombos have anything to do with symbolism.

As noted above, Richard Klein (1999, 2008; Klein and Edgar 2002: 271–2) argues that a single mutation installed a language organ some 50,000 years ago, triggering a symbolic and cultural explosion in Africa, the Middle East and Europe. Although Chomsky (2005, 2012: 43) still supports this once-popular idea, it has little to recommend it. We should be suspicious when a puzzle regarding our own species is addressed using 'special' methods—methods without parallel elsewhere in evolutionary science. No biologist studying, say, elephants or social insects would invoke a single fortuitous mutation as sufficient explanation for an entire complex adaptation. Neither would a behavioural ecologist explain an animal species' behavioural or other adaptations by invoking fixed properties of its 'mind' or 'mind/brain'. Mental capacities themselves have to be explained, and this is done by reference to a wider context of reproductive, social, foraging and other behavioural strategies conceived as adaptations to changing conditions. We need a theory of the evolution of *Homo sapiens* faithful to the methods of behavioural ecology which have proved so successful elsewhere in the living world.

It might be thought that by now, we would have a number of theoretical attempts in this direction. Sadly, this is not the case. If we restrict ourselves to hypotheses which are (a) based on tried-and-tested methods of behavioural ecology; (b) focused on the emergence of symbolism; and (c) testable in the light of archaeological data, the range is strikingly limited. Camilla Power's Female Cosmetic Coalitions model (see discussion in Sections 17.9–17.11) meets all three conditions. But before evaluating it, I will survey a range of models which meet at least some of these basic preconditions.

17.5 Costly versus cheap signals: co-operation between strangers

17.5.1 *Philip Chase: Symbolism enforces co-operation between strangers*

During the later phases of human evolution, humans began to invent entities lacking any existence in the real world—intangibles such as underworlds, promises, and totems. Symbolic culture arose because its coercive rituals and associated belief systems provided the only mechanisms of punishment and reward capable of enforcing co-operation between strangers, in turn a prerequisite for the establishment of institutional facts. The term 'co-operation between strangers' means co-operation on a scale transcending the limits of Darwinian kin-selection or reciprocal altruism (Chase 1994, 1999).

17.5.2 *Richard Sosis: Costly ritual enforces co-operation between strangers*

Religious communities are networks of 'strangers' held together by costly ritual. The supernatural entities that help to inspire allegiance don't spontaneously replicate in

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human brains: they must be coercively installed. Painful ordeals such as initiation rites perform this function. The only way to reliably demonstrate religious commitment is to undergo rituals so demanding of personal sacrifice that the benefits of subsequent defection are likely to be outweighed by the costs (Sosis 2003).

17.5.3 *Merlin Donald: Mimesis*

Symbolic culture became established as *Homo erectus* came under communicative pressure to exercise cognitive control over previously hard-to-fake, emotionally expressive body language. Mimetic culture emerged as learned, culturally transmitted, simulated versions of previously instinctive responses. Through dance, song, pantomime, and ritual, evolving humans bonded with one another more and more closely, becoming correspondingly adept at expressing in public their emotional and cognitive states (Donald 1990, 2001).

17.5.4 *Dan Sperber: To qualify as symbolic, an expression must be false*

To determine whether a signal or statement is 'symbolic', a simple rule can be applied. Is it patently false? If not, symbolism is absent. Expressions are symbolic, according to Sperber, to the extent that they are literal falsehoods serving as guides to communicative intentions. Metaphor, irony, sarcasm, and much verbal humour illustrate the principle—'saying' one thing while 'meaning' another. This communicative strategy relies on listeners' inferential and imaginative abilities; it is central to all linguistic communication. Language in some form must have begun evolving from the moment when, for whatever reason, our ancestors first began deploying and decoding patent falsehoods in communicatively helpful ways (Sperber 1975, 2005; Sperber and Wilson 1986).

17.5.5 *Roy Rappaport: In the beginning was the Word*

Words are cheap and therefore unreliable. Communal investment in repetitive and invariant (purposefully 'inefficient') ritual is the solution to this problem. At the apex of any congregation's hierarchy of symbols is its 'ultimate sacred postulate'—that article of faith which lies beyond possible denial. Without the community's confidence in that symbol of itself, faith in the entire system of interconnected symbols would collapse. During the evolution of humanity, therefore, the crucial step was the establishment of community-wide rituals capable of upholding the levels of public faith necessary for low-cost verbal communication to work (Rappaport 1999).

17.5.6 *Jerome Lewis: Hunting, mimicry, and play*

Since they are incapable of mimicry, the various antelopes, monkeys, and other animals hunted by Central African forest people trust their own species-specific calls, treating them as intrinsically reliable. Forest hunter-gatherers routinely exploit

such gullibility, faking animal cries to lure their targets within range. When these same hunters subsequently recall a particular hunting episode, they act out the story drawing on the same sophisticated capacities for faking, mimicry and pantomime. Story-telling, ritual, play, and religious symbolism in such societies are the in-group, co-operative, and correspondingly honest redeployment of capacities for deception initially deployed in the forest. This converges with the people's indigenous view: they conceptualize their signs, songs, and rituals as echoes of the forest's own voices and spirits (Lewis 2009, Chapter 7; Knight and Lewis, Chapter 21).

17.6 Symbolism: puzzles and paradoxes

Turning now to a review of these ideas, archaeologist Philip Chase asserts that Darwinism alone cannot explain co-operation between strangers. He also reminds us that symbolic culture enforces just this kind of co-operation. But how did symbolic culture itself emerge? Having posed the question with admirable clarity, he leaves the evolutionary emergence of symbolic culture unexplained.

Behavioural ecologist Richard Sosis does offer a Darwinian model in which individual strategies of alliance-building enforce co-operation between strangers. To explain the mechanisms at work, Sosis relies on costly signalling theory (Zahavi 1975; Zahavi and Zahavi 1997). Religious communities hold themselves together by insisting that each individual member pay admission and continued membership costs so heavy as to deter freeriding. The threshold of costs will be set by the probability of social defection. This explains why rituals of initiation are so often painful, and potentially why there should be variability in costliness. A ritual involving no hardship or sacrifice cannot signal commitment: it would allow freeriders to flourish. Sosis has done his main studies on contemporary or recent historic religious communities, who are already immersed in symbolic culture. In principle, however, the model can apply to the evolutionary emergence of ritual and religion. Indeed Alcorta and Sosis (2005) discuss the African Middle Stone Age archaeological record, mainly the ochre evidence, in relation to this model. The value of this work is that it suggests a bridge between animal signalling and symbolic cultural display: the same body of theory can be applied in both domains. But why exactly must hard-to-fake ritual generate what Chase (1994) terms 'things that have no existence in the "real" world'? Hunter gatherer ritual and religious landscapes are populated by animal spirits, tricksters and other such fictional entities. What is the connection between these two apparently incompatible properties of ritual—its intrinsic reliability on the one hand and its reliance on trickery on the other?

In stark opposition to the hard-to-fake costly signal model stand Merlin Donald and Dan Sperber. For symbolism to evolve, if we accept their positions, evolving humans had to stop probing signals for their reliability and instead collude with patent fakes. At first sight, this seems wholly incompatible with Sosis' argument that

symbolically constituted communities hold themselves together by resorting to signals whose reliability is underwritten by their costs. If Donald and Sperber are correct, symbolism seems to presuppose signals which are not just unreliable but patently false. But perhaps the cheap signals and the costly ones perform distinct functions, operating on quite different levels?

This is essentially the argument of Roy Rappaport (1999), the distinguished social anthropologist who rejected modern selfish-gene Darwinism but independently discovered the costly signalling idea. Social acceptance of symbols presupposes high levels of trust already in place. Sosis follows Rappaport's argument that costly ritual is designed to generate trust where none existed before. Integrating these lines of reasoning, we might conclude that ritual is needed to cement bonds sufficiently trusting to permit communication on the basis of cheap fakes such as words.

Let me put this another way. A distinction can be drawn between signalling costs of two kinds (Grafen 1990a; Guilford and Dawkins 1991). Either the signaller must generate trust on a signal-by-signal basis, or sufficient trust can be assumed already in advance. In the first case, the relatively low costs involved in minimizing perceptual ambiguity won't suffice: added costs must be incurred to ensure reliability as well. A strong case can be made that all animal signals without exception involve costs of both kinds—'efficacy costs' plus 'strategic costs'. The reason for this is that animal signals must always carry at least some of the burden of generating the trust necessary for communication to work.

Now to the second case. What if the signaller doesn't have to generate trust at all? Trust could be assumed already in advance, leaving the signaller free to concentrate on perceptual discriminability. Suppose no strategic costs whatever need be incurred. All signalling effort can now be poured into efficacy. Carried to its conclusion, this should permit reduction to digital alternatives—enabling communication of the cheapest, most efficient kind theoretically possible. We know that human language is in fact digital in fundamental ways, both phonological and semantic, this being one of its most remarkable, biologically unprecedented characteristics (Jakobson 1938; Burling 2005: 25–7, 53–5; Chomsky 1991: 50).

As an evolutionarily stable strategy, digital encoding under Darwinian social conditions is ruled out for the same reason that reliance on patent falsehoods is ruled out. Costly signals, by definition, are signals designed to demonstrate reliability. Regardless of receiver psychology, they can't be decoded in either/or (i.e. 'digital') terms. If all primate vocal repertoires are ultimately graded rather than discrete (Clay and Zuberbühler, Chapter 11), the reason is simple: signallers and receivers have conflicting interests, preventing them from carving up the cost continuum into conventionally agreed categories. As meanings are contested, the gradations are infinite, leaving receivers with no choice but to evaluate performance on an analog scale (Zahavi and Zahavi 1997: 57–8).

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Putting all this together, it seems that language is digital for the same reason that it isn't real. Its field of operation is exclusively the imagination. Its zero-cost features can be prove socially acceptable and evolve only under highly unusual conditions—namely, those internal to a ritually bonded community whose members cannot benefit from lying.

Combining the insights of Chase, Sosis, Donald, Sperber, and Rappaport, we might summarize by defining symbolic culture as a domain of transparent falsehoods whose social acceptance depends on levels of trust generated through the perform-ance of costly ritual. We might add that once the relevant fictions are socially accepted, they qualify automatically as 'institutional facts' (Searle 1995; see Wyman, Chapter 13). Whether in language or elsewhere, institutional facts are digitally con-trastive by logical necessity. You cannot be more or less someone's wife, more or less a knight in chess. X either does have status Y or it doesn't: there are no shades of grey. Since they depend on communal agreement, facts of this special kind presuppose the uniquely human phenomenon of 'co-operation between strangers'. While such co-operation must have evolved, it remains to be explained how and why.

Following Maynard Smith and Harper (2003: 3), we may define a 'signal' as any act or structure which alters the behaviour of other organisms, which evolved because of that effect, and which is effective because the receiver's response has also evolved. If one animal pushes away another, that's not a signal. If one animal makes another retreat by baring its teeth, that action is a signal because the response depends on evolved properties of the receiver's psychology and sense organs. The signal must carry information of interest to the receiver. While this needn't always be correct, it must be correct sufficiently often for receivers to be selected to respond appropri-ately. Against this background, Krebs and Dawkins (1984) conceptualized signal evolution as an arms race between signallers as manipulators and receivers as mind-readers. Zahavi (1975; Zahavi and Zahavi 1997) proposed 'the handicap prin-ciple' to explain why signal selection in the animal world favours extravagance and apparent wastefulness, not utilitarian efficiency. Receivers on guard against deception force signallers to compete in producing signals so costly that they cannot be fakes.

The problem is that by these standards, fast, efficient, digital communication on the model of language appears to be theoretically impossible, a point which is explicitly made by Zahavi (1993). As Steels (Chapter 24) explains, communicative efficiency—not wasteful extravagance—is the engine driving grammaticalization in human lan-guages. But how, during human evolution, did the shift from wastefulness to efficiency come about? Machiavellian primates can produce tactical deceptions, but these are frequency-dependent: they work only if most signals are honest. To explain the emergence of human cultural symbolism, we need a theory which addresses this difficulty: How can we imagine falsehoods so prevalent and so valued as to be embraced by all? How can we imagine Machiavellian evolving humans, by definition resistant to deception, opting to immerse themselves in infinite realms of fiction?

Here is a possible solution. Is this or that signal deceptive or reliable, costly or cheap, analog or digital? It depends on who is doing the evaluating and from what standpoint. Imagine a coalition of individuals co-operatively aiming deceptive signals at an external target. Viewed from inside the coalition, those patent deceptions will have positive value. Instead of being resisted, they should be celebrated and embraced. But that's only when viewed from the inside; viewed from an external perspective, everything will seem quite different. To quote Saussure (1983 [1915]: 8) once again: 'The object is not given in advance of the viewpoint: far from it. Rather, one might say that it is the viewpoint adopted which creates the object.'

Drawing on his work with the Mbendjele forest people of Central Africa, Jerome Lewis (2009, Chapter 7) offers a proposal along similar lines, viewing distinctively human capacities for vocal mimicry and deception as adaptations to the hunter-gatherer lifestyle. Human volitional control over vocal signalling, he suggests, did not evolve initially in contexts of human social interaction. Instead, it was used initially to deceive prey animals who would prove vulnerable again and again to such fakes. Humans co-operating with one another to deceive external targets wouldn't be predicted to resist one another's deceptions. On the contrary, they should echo and amplify them. In Lewis' account, vocal simulations re-deployed internally within the community laid the basis for vocal humour, children's games, choral singing, narrative fiction, metaphor, religion, and so forth. Humans successfully 'deceived' the forest and then constructed the symbolic domain as that forest's own echo, now directed back into the human social world.

We now need to consider how hunter-gatherer strategies of this kind might have beome established in the evolutionary past.

17.7 Counter-dominance, egalitarianism, and collective intentionality

17.7.1 *Michael Tomasello: The cultural origins of human cognition*

Cultural evolution can proceed rapidly, helping to explain the accelerated pace of evolution since the emergence of *Homo sapiens.* Cultural advance presupposes the 'ratchet effect', in which innovations are preserved and accumulated intergenerationally. This would have been fostered by co-operative strategies in which individuals subordinated their private purposes to collective future goals. Apes are not capable of this kind of co-operation, which explains why they don't even point—or, at least, don't point things out to one another when interacting under natural conditions in the wild. Declarative pointing presupposes 'we'-intentionality: a shared subjectivity rendering things interesting or relevant 'for us'. It involves a triadic structure of representation in which signaller and receiver share the same focus of attention. If the cognition of apes is poorly adapted to such tasks, the explanation is ultimately that in the wild, their way of life makes them just too competitive (Tomasello 1999, 2006).

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17.7.2 *Andrew Whiten: The evolution of deep social mind*

Primate Machiavellian cognition reflects the fact that reproductive success is likely to be secured by deception and trickery as much as by honesty and co-operation. In humans, strikingly novel cognitive developments reflect novel strategies of co-operation whose roots lie in 'counter-dominance'—resistance to being physically dominated by others. Within increasingly stable coalitions, internal status began to be earned in novel ways, social rewards accruing to those perceived by their peers as especially co-operative and self-aware. Selection pressures favoured such psychological innovations as imaginative empathy, joint attention, moral judgment, project-oriented collaboration, and the ability to evaluate one's own behaviour from the standpoint of others. Underpinning enhanced probabilities of cultural transmission and cumulative cultural evolution, these developments led to the establishment of hunter-gatherer-style egalitarianism in association with minds which were now 'deeply social' (Whiten 1999).

17.7.3 *Christopher Boehm: From counter-dominance to reverse dominance*

During the later stages of human evolution, counter-dominance tipped over into 'reverse dominance'. Humans became so resistant to being dominated by others that they remained constantly on guard, ready at any moment to band together in countering perceived threats (see Dessalles, Chapter 20). As coalitions organized in this way regularly defeated all opposition, they established themselves collectively as the dominant force. Society became 'moral' when everyone was embraced within the same coalition, evaluating the behaviour of its individual members from this new collective standpoint (Boehm 1999, 2012).

17.7.4 *Robin Dunbar: Social brain, gossip and grooming*

Seeking safety in numbers, evolving humans favoured life in larger groups. Among primates, the larger the group, the more intense are the likely levels of internal competition presenting individuals with increased prospects of harassment and associated stress. Social success in larger groups also selects for a larger neocortex, hence increased childcare burdens, placing females in particular under more reproductive stress. Dunbar proposes a strategy for cutting the costs of time budgets. Females and other subordinates buffer themselves by forming defensive alliances, maintaining friendships through manual grooming. As alliances become progressively larger, pressure mounts to find a cheaper, more efficient way of maintaining social bonds. There is a solution: switch to vocal grooming. By using vocal sounds in place of fingers, evolving humans discover that they can service multiple allies at once while leaving their hands free for practical tasks. Although the idea has been heavily criticised (Power 1998), Dunbar (1996b) claims that 'gossip' has its origins here.

17.8 Dominance and reverse dominance

Psychologist Michael Tomasello studies the cognitive interface between humans and other primates. The special thing about humans, in his account, is co-operation in pursuit of a future goal held jointly in mind. An element of contractual understanding is involved, since commitment would collapse without confidence that promised gains will be shared. Resource sharing is in this way bound up with an orientation toward the future. There has to be a dream or vision, those sharing it committing themselves to whatever forms of collaboration are needed to secure its practical implementation.

So how and why did *Homo sapiens* begin collaborating in this special way? The fact that wild-living apes don't even point things out to one another shifts attention from cognitive mechanisms to competitive and co-operative strategies. Declarative pointing presupposes individuals so trusting and co-operative that they are willing to decide collaboratively on the perspective to be adopted toward the world. Humans during the course of evolution established such 'we'-intentionality. Linguistic rules and symbols—complex elaborations on the simple theme of pointing—are, in Tomasello's view, culturally inherited patterns which evolved and became transmitted from the moment when this development occurred. As to why it occurred, Tomasello once remarked—with refreshing candour—'I really have no idea' (Tomasello 2003b: 108–9). Pressed for an answer, he now invokes an early stage of obligatory collaborative foraging followed by the development of group-on-group social conflict and competition (Tomasello et al. 2012).

Without giving it special emphasis, Tomasello also considers a third possibility: collective resistance to being dominated by 'individuals who attempted to hog all of the food' (Tomasello et al. 2012: 676). The struggle to resist dominance ('counter-dominance') has an inherent tendency to bring together unrelated individuals who might not previously have been allies. Andrew Whiten (1999) invokes this idea to explain why human hunter-gatherers evolved to be so insistently egalitarian. In Whiten's model, humans retain their primate heritage of 'Machiavellian' strategic intelligence, initially without undergoing any psychological rupture or break. But as they developed increasingly effective strategies of resistance, the benefits of imposing dominance on others became matched by the associated costs. Eventually a stalemate was reached: instead of everyone competing to find someone else to dominate, the winning strategy was 'don't mess with me'—a generalized refusal to be dominated. As this strategy became evolutionarily stable, it altered the trajectory of cognitive and cultural evolution, leading to the emergence of distinctively modern human psychology.

Whiten avoids the conundrums and paradoxes associated with the topic of symbolism. Boehm does little better, barely mentioning ritual, religion or language.

Yet Boehm takes one notable step in the necessary direction. Tomasello, as we have seen, links the evolution of symbolism with collaboration in pursuit of a shared vision or goal. Boehm in this context offers a concrete proposal. The vision which mattered was a *political* one. There was an effort to take hold of primate-style dominance and turn it upside down. No longer should physical violence or threat be allowed to determine access to resources or status within the group. Humanity's first moral community was committed to the ideal of an egalitarian order turning dominance on its head.

According to Boehm, the strategy of resisting dominance leads eventually to full-scale revolution. But how exactly did this happen? Boehm asks us to envisage a coalition expanding until it eventually includes everyone. This is an unrealistic concept: a coalition by definition presupposes a boundary between insiders and outsiders. Given that primate dominance is always in some sense sexual, it would follow that a model of counter-dominance culminating in reverse dominance should take account of this. Could male-versus-female conflict and co-operation lead to a coalition embracing everyone? Boehm (1999) does consider distinctively female strategies, but only when dealing with chimpanzees. As he turns to consider the emergence of human hunter-gatherer egalitarianism, sex surprisingly disappears.

If we are to consider counter- and reverse dominance in human evolution, the most critical issue becomes reproductive counter-dominance. How do these models deal with the question of reproductive inequality or 'skew' among males—that is, with the degree to which any dominant male can monopolise reproductive success? Bowles (2006) points to reproductive levelling among predominantly monogamous hunter-gatherers as critical to egalitarianism. To explore the evolutionary establishment of egalitarianism on this reproductive level, we must ask questions about the strategies of females.

According to the Social Brain hypothesis (Dunbar 1996a, 1998, 2003), the factor driving increase in neocortex size in hominin ancestors was increasing group size. In the case of early *Homo*, as climate dried towards the end of the Pliocene, groups needed to be bigger for protection in more open environments. In the case of later *Homo*, during the Pleistocene, the main danger of predation was likely to have been from other human groups. Under pressure to live in larger groups, *Homo* was selected for increased Machiavellian intelligence to negotiate increasing social complexity. Pawlowski et al. (1998) show that as neocortex size increases in primates, the correlation of male rank with mating success is progressively undermined. Selection for increased social intelligence therefore goes hand in hand with greater reproductive levelling.

Larger brain sizes in later *Homo*, along with larger bodies, led to increased costs of reproduction for females. It is now time to consider how the extra energetic requirements of mothers of large-brained offspring were met. We turn to models for sexual strategies and investment.

17.9 Female coalitionary strategies

17.9.1 *Sarah Hrdy: The origins of mutual understanding*

Ape mothers are insufficiently trusting to allow others to hold their babies. *Homo erectus* mothers, facing increasingly heavy childcare burdens, enhanced their fitness by getting trustworthy kin—especially female kin—to help. However, according to Hrdy, this was only possible if mothers and daughters could stay close together (see Hawkes, Section 17.9.2). Distinctively human cognition evolved in this female kin-coalition context, as mothers probed potential allocarers for their co-operative intentions. Infants monitoring the intentions and feelings of mothers and others became adept at perspective-taking and integrating multiple perspectives. Offspring more skilled in reading the intentions of others and eliciting their help were better nourished and more likely to survive. Female strategies of co-operative childcare can explain how and why humans became cognitively and emotionally 'modern' (Hrdy 2009).

17.9.2 *Kristen Hawkes: Grandmothering and show-off hunting in human evolution*

Hawkes and colleagues, James O'Connell and Nick Blurton Jones, offer two key arguments for investment in offspring at different stages of human evolution. The 'grandmother' hypothesis (Hawkes et al. 1998; O'Connell 1999) argues for the beginnings of humanlike life history in early *H. erectus*. Burdened with increasingly heavy childcare costs, evolving *Homo* mothers sought help from the most reliable source— female kin and especially their own mothers. Post-reproductive lifespans extended as older females came under selection pressure to invest in the offspring of their daughters. As the climate became drier in the Early Pleistocene, increasing the scarcity of accessible foods for weanlings, older females stepped in, providing gathered foods such as tubers to these young offspring. In terms of life history, this selected for relatively early weaning (hence shorter interbirth intervals) along with longer childhood dependency on adult provisioning, with correspondingly delayed sexual maturity and longer lifespans. Males were intermittently or unreliably involved in supporting offspring at this early stage, but during the Middle Pleistocene (associating to *Homo heidelbergensis*), hunting strategies become more effective and reliable. Males were motivated to hunt big game to gain prestige in female eyes. Rather than hunt small to medium game for their own genetic offspring alone, they demonstrated quality by generously providing big game to the whole camp (Hawkes and Bliege Bird 2002). In short: females gained male investment by stimulating mating effort rather than by attempting to keep males monogamously faithful and paternal.

17.9.3 *Camilla Power: Female cosmetic coalitions*

The evolution of concealed ovulation, extended receptivity, and increased reproductive synchrony in the human female forced males to spend more time in female

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company. Potential philanderers were deprived of the information they needed to successfully rove from one female to the next, picking and choosing on the basis of current fertility cues. However, one signal—menstruation—was unavoidably left salient, giving away this potentially dangerous kind of information. As an indicator of imminent fertility, menstruation will trigger conflict both between males, who may compete for the cycling female, and between females, who may compete for male investment. In the absence of countermeasures, mothers who are pregnant or lactating may be at risk of losing male investment to the cycling female. The rapid increase in neocortex size characteristic of human evolution over the last half million years meant that mothers—now burdened with correspondingly heavier childcare costs—could no longer tolerate rampant philandering; it was in their individual fitness interest to prioritise future economic security over short-term sexual favour-seeking. Counter-dominant female coalitions on this basis responded by 'painting up' with false signals representing all members of the coalition as uniformly 'fertile'. Investor males—whose offspring might have better chances of survival—had a fitness interest in colluding with the corresponding fictions. The evolutionary stability of female strategies of cosmetic bonding and adornment culminated in the transition to symbolic ritual, and—as a consequence of dramatically increased levels of in-group trust—the earliest beginnings of language-like communication (Power and Aiello 1997; Power 1999, 2009, Chapter 15; Power et al. 2013).

17.10 On co-operative breeding

Sarah Hrdy effectively combines the 'grandmother' model with Tomasello's arguments for intersubjectivity as the basis for human culture and cognition. Pregnancy and postnatal childcare in *Homo* were exceptionally heavy burdens, offering for that reason the most convincing context for the development of novel co-operative strategies. Alone of the great apes, we became co-operative breeders. Hrdy's arguments about the effects of alloparenting on human cognitive evolution are persuasive. Her focus on changing female strategies and on consequences for infant psychology are necessary and welcome. Demographically flexible co-operative breeding networks could act as a safety net for mothers, compensating for extreme variability in levels of male commitment.

Neither Hrdy nor Kristen Hawkes, whose model Hrdy acknowledges as the initial steps into co-operative breeding, aim to deal with symbolic culture. Both models also keep males as investors in the margins, with female kin getting on with the job, not expecting regular investment from males. Males enter the picture only late, becoming more reliable hunters as female sexual choice drives them to intensified mating effort. There is no clear argument from Hawkes as to what causes the shift in male behaviour and productivity between *Homo erectus* and subsequent encephalized humans. In fact, in her life history models she does not take much account of

increasing brain size, even though this must have been critical in adding to female costs. Among Hadza bow-and-arrow hunters, to this day, males are only intermittently successful, an observation which led Hawkes to doubt the validity of the model of 'man the hunter' provisioning exclusively his own genetic offspring.

Camilla Power concurs with Hrdy's and Hawkes' initial position of female kin-related social structures among *Homo erectus.* Because female fertility is affected by the grandmother strategy—mothers with allocare support tending to have shorter interbirth intervals and be fertile more often—this must affect male behaviour. More dominant males might attempt to target fertile females opportunistically, moving from one to another, while less dominant males could pursue a strategy of hanging around more reliably, offering provisioning and protective support to a particular female and her kin. As interbirth intervals shortened, one consequence would be that investor males who waited around instead of competing for additional mates should gain reproductive benefits. Such a picture of variability in male commitment fits Hrdy's observations of stark differences between modern human fathers.

Power argues that while such variability may have been tolerable for less encephalized early *Homo erectus,* as brains rapidly expanded during the Late Middle Pleistocene (from *c.* 500,000 to 150,000 kya), female fitness would have been increasingly affected by whether or not males were providing help. In these conditions among *Homo heidelbergensis*, sporadically in Eurasia, and increasingly regularly in Africa, females resorted to the cosmetic strategy from *c.* 300,000 kya. This had the effect of rejecting dominant male philanderers reluctant to work and invest—in favour of more co-operative males competing to impress females with their hunting skills and generosity (Power et al. 2013).

An advantage of Power's model is that the emergence of symbolism is intrinsic to the strategy. Symbols are socially accepted fakes; that means, in the first instance, cosmetics. But were pigments necessarily used by women alone? Evolving human males had little Darwinian reason to alter or transform their biologically perceptible identity. With females, matters had always been more complex. The evolving human female had good reason to conceal external signs of ovulation, since philanderer males might use the information to their advantage. The use of blood-red cosmetics to scramble menstrual signals was in that sense nothing new. Power's model does not exclude males from using cosmetics; but, she argues, it's hard to think of a good Darwinian reason why males should take the lead in 'faking' their biological appearance using cosmetics (see Power, Chapter 15). At present, the Female Cosmetic Coalitions (FCC) model is the only Darwinian explanation as to why processed, curated, distinctively *blood-red* ochre is so prominent at Blombos and other Middle Stone Age sites.

The FCC model posits counter-dominance leading to reverse dominance. Unlike in Boehm's version of reverse dominance, however, in Power's FCC scenario both the initial dominance and its subsequent reversal are gendered. The model applies a

standard behavioural ecological approach (one distinguishing sexual strategies and male and female trade-offs) to the suggestions of Whiten and Boehm. Females concealing ovulation and extending sexual receptivity are already promoting 'counter-dominance' on a sexual level, since the strategy discriminates against dominant males in favour of subordinates more likely to invest time and energy. When the scrambling of reproductive signals is extended to menstruation, the effect is to tip 'counter-dominance' into 'reverse dominance'. When a female begins to menstruate, her senior female kin have every interest in surrounding her, identifying with her attractions and 'painting up' to spread those attractions around. But they also have every interest in barring male access to her except on their terms (compare Knight 1991; Knight et al. 1995).

Hawkes' model of male hunting as a 'show-off' strategy needs to be placed in this wider sexual and political context. After all, there are many different ways in which males might show off, not all of them conducive to symbolic culture. Males could resort to physical force, 'showing off' through violence and aggression (see Dessalles, Chapter 20). An advantage of the Female Cosmetic Coalitions model is that it explains how males might have been corralled into showing off helpfully rather than destructively.

17.11 Sex and symbolism

Whereas Chase argues that symbolic culture emerges in order to enforce co-operation between strangers, Power sets out from selfish-gene theory and stays with it throughout. 'There is no reason to believe that symbolic culture was ever essential to survival', writes Chase (1994: 626–8). But in that case, why invest so much energy in the necessary rituals? Chase has contributed to the conceptual definition of symbolic culture, but in the absence of any evolutionary theory he lacks specific predictions about exactly what taboos, laws or rules would be collectively enforced. By contrast, Power offers an array of specific predictions testable against the archaeological, fossil and ethnographic records (Power 2009: 273, table 14.2; for detailed ethnographic tests, see especially Watts 2005).

But how exactly does the model generate such detailed predictions? In pursuing their direct reproductive interests, women 'gang up' on anyone in their ranks who might constitute a weak link in the chain. A female who has just begun cycling comes potentially into that category: in view of her evident fertility—hence special attractiveness to males—she might be tempted to break ranks. Abandoning his current partner, we would expect any would-be philanderer to be on the look-out for such an opportunity. To gain his attention, we would expect the favour-seeking female to indicate that she is of the same species as the dominant male, of the opposite sex and currently or imminently fertile. This immediately gives us the predicted signature of reverse dominance. The defiant, cosmetically adorned coalition must bond tightly

with the female concerned. Reversing her perceived biological identity, they must signal collectively: 'Wrong species, wrong sex, wrong time!'

Note that we now have a coalition which might in principle extend to embrace everybody, as Boehm's argument demands. On the one hand, the entire female community has an interest in joining up, irrespective of kinship or previous friendship or familiarity—all should benefit over the long term by making philandering an unplayable game. But the coalition of females should also expect male support. Brothers and sons might be expected to defend female kin. Investor males should have an interest in ganging up against dominant philanderers threatening to impregnate their long-term mates. On all these grounds, we might expect the 'reverse dominance/reverse reality' coalition to succeed in imposing its message.

There is cognitive hardship in believing in counter-reality. It is not easy to accept that reality as perceived can be so completely reversed—that the categories of human versus animal, female versus male, menstrual blood versus hunting blood can be so radically interchanged and confounded. But such tricks—the stuff of mythology the world over—are not arbitrary cultural inventions. Reverse dominance generates them by conceptual necessity. The message which results is patently false. The biological female undergoing her initiatory ordeal (her incorporation into the coalition) is not a male, not an animal and not wounded. But if everyone accepts the fiction, it's an institutional fact. And not just any such fact. If Power's argument is accepted, reverse sexual dominance by its own internal logic generates a characteristically hunter-gatherer version of Rappaport's Ultimate Sacred Postulate—a paradoxical truth serving to underpin all others.

17.12 Conclusion

In this chapter, I have tried to show how the problem of the emergence of symbolic culture might be solved. In revisiting a set of currently prominent models—all of which offer insights—I have asked how we might parsimoniously fit them together.

My aim has not been to set up the Female Cosmetic Coalitions (FCC) model in opposition to the others considered here. Chase is correct to view symbolic culture as a means of enforcing co-operation between strangers. But we require more than a statement: we need a Darwinian explanation. Rappaport and Sosis are surely right about the importance of ritual, but for a model of ritual origins to be testable, we need sufficient detail: which rituals, serving whose purposes, when, where, how, why? Donald is persuasive in his arguments about mimesis. But mimesis is 'faking it': if everyone is just acting, why should anyone believe? Similar theoretical difficulties afflict Sperber: how, when, where, and on what basis could patent falsehoods have been trusted by evolving humans as valid intellectual currency? Whiten's model is persuasive but unfortunately avoids the topic of sex, as does Boehm's. Whiten and Boehm correctly address politics, but skate over the nuts and bolts. What specific

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political purposes might have been sufficiently constant and unifying to give rise to 'deep social mind'? Tomasello posits commitment to shared future goals as a condition for language's evolutionary emergence. Can we specify whose goals? Hrdy reminds us that half the human population is female, and that mothers caring for infants are most likely to have driven the emergence of new strategies of social cognition and co-operation. But why stop short of the emergence of symbolism, given the increasing reproductive costs of encephalization following the evolution of *Homo erectus?* Why not explain the relatively late emergence of symbolism in terms consistent with the previous logic of allocare? Hawkes brings male mating effort back into the picture, but without explaining why symbolism had anything to do with it.

Lewis comes into a rather different category. Instead of proposing yet another cultural origins theory, he invites us to open our minds to the insights of hunter-gatherers. The Mbendjele forest people who inspire Lewis' vision challenge the conceptual distinctions central to western evolutionary and social science. Language, play, ritual and cosmology are all cut from the same cloth. Religion is not a different thing from childhood pretend-play: it's pretend-play taken seriously and continued into adult life. Hunting or gathering is not necessarily distinct from speaking or singing: from a Mbendjele perspective, it involves pleasing the forest by echoing back its own sounds. Lewis argues persuasively that such interconnections should be borne in mind by those of us struggling to explain the evolutionary emergence of human language and symbolic culture. It may be that everything is simpler than we thought.

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