‘HONEST FAKES’ AND LANGUAGE ORIGINS

CHRIS KNIGHT

School of Social Sciences, Media and Cultural Studies, University of East London, Docklands Campus, London E16 2RD

> *‘The passage from the state of nature to the civil state produces a very remarkable change in man, by substituting justice for instinct in his conduct, and giving his actions the morality they had formerly lacked. Then only, when the voice of duty takes the place of physical impulses and right of appetite, does man, who so far had considered only himself, find that he is forced to act on different principles, and to consult his reason before listening to his inclinations’.*
>
> Jean-Jacques Rousseau, *The Social Contract* (1973 [1762]: 195).

1. Digital minds in an analog world

Language has been described as a ‘mirror of mind’. Chomsky attributes this idea to ‘the first cognitive revolution’ inspired by Descartes among others in the seventeenth century. ‘The second cognitive revolution’ – triggered in large measure by Chomsky’s own work – is taken to have been a twentieth century rediscovery of these earlier insights into the nature of language and mind. In 1660, the renowned Port Royal grammarians (Arnauld and Lancelot 1972 [1660]: 27) celebrated

> ‘this marvelous invention of composing out of twenty-five or thirty sounds that infinite variety of expressions which, whilst having in themselves no likeness to what is in our mind, allow us to disclose to others its whole secret, and to make known to those who cannot penetrate it all that we imagine, and all the various stirrings of our soul’.

For Descartes himself, however, this was no human invention: ‘the seat of the soul’ was the pineal gland (Descartes 1991 [1640]: 143). In Chomsky’s reformulation, the relevant organ becomes ‘that little part of the left hemisphere that is responsible for the very specific structures of human language’ (Chomsky in Piatelli-Palmarini 1980: 182). As Pinker (1999: 287) puts it: ‘We have digital minds in an analog world. More accurately, a part of our minds is digital.’

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But if 'a part of the mind is digital', how did it ever get to be that way? Under what Darwinian selection pressures and by what conceivable mechanisms might a digital computational module become installed in an otherwise analog primate brain? Can natural selection acting on an analog precursor transform it incrementally into a digital one? Is such an idea even logically coherent?

If these were easy questions, the origins of language – recently dubbed the 'hardest problem in science' (Christiansen and Kirby 2003) – might long ago have been solved. Chomsky accepts Darwinism in principle, but doubts its direct relevance to this particular problem. In his view (Chomsky 2005: 12), the 'leap' to language 'was effectively instantaneous, in a single individual, who was instantly endowed with intellectual capacities far superior to those of others, transmitted to offspring and coming to predominate….' He considers the language faculty to be 'surprisingly perfect' – just as we might expect had it been designed by 'a divine architect' (Chomsky 1996: 30). Of course, Chomsky is no creationist. But otherwise supportive Darwinians have criticized him for suggesting an apparent miracle – forgetting, perhaps, that Chomsky's guiding principle is internal consistency, not conformity with the rest of science. 'In fact', writes Chomsky (2005: 12) in justifying his 'Great Leap Forward' narrative, 'it is hard to see what account of human evolution would not assume at least this much, in one or another form.' Chomsky is informing us that language *as he defines it* cannot gradually have evolved.

Chomsky (2005: 11-12) explains:

> 'An elementary fact about the language faculty is that it is a system of discrete infinity. Any such system is based on a primitive operation that takes *n* objects already constructed, and constructs from them a new object: in the simplest case, the set of these *n* objects. Call that operation Merge. Either Merge or some equivalent is a minimal requirement. With Merge available, we instantly have an unbounded system of hierarchically structured expressions. The simplest account of the "Great Leap Forward" in the evolution of humans would be that the brain was rewired, perhaps by some slight mutation, to provide the operation Merge, at once laying a core part of the basis for what is found at that dramatic ''moment'' of human evolution….'

Merge, then, is more than an empirical necessity: it is a logical one. It is the procedure central to any conceivable system of 'discrete infinity'. Merge is recursive: it means combining things, combining the combinations and combining these in turn – in principle to infinity. Chomsky suggests that a 'slight mutation' may have allowed a single human ancestor to accomplish this for the first time. No matter how we imagine the physical brain, according to

Chomsky, the transition to Merge is instantaneous, not gradual. This is because discrete infinity – 'the infinite use of finite means' – either is or is not. What sense is there in trying to envisage 'nearly discrete' objects being combined in 'nearly infinite' ways? A moment's thought should remind us that when the objects to be arranged are subject to even limited blending, the range of combinatorial possibilities crashes to a restricted set. In short, for Merge to do its work, the elements available for combination must be abstract digits, not concrete sounds or gestures. Combining a sob with a cry would not be an example of Merge. Neither would we call it Merge if a chimpanzee happened to combine, say, a bark with a scream (Crockford and Boesch 2005).

2. Analog minds in a digital world

One way to escape the conundrums inseparable from Chomsky's position – conundrums central to the recent explosion of debates on language origins and very well documented by Botha (2003) – might be to keep the essential idea but reverse the underlying philosophy. Humans have analog minds in a digital world. More accurately, just *a certain part* of our world is digital. We are at one with our primate cousins in being immersed in ordinary material and biological reality – Pinker's 'analog world'. But unlike them, we have woven for ourselves an additional environment that is digital through and through. This second environment that we all inhabit is sometimes referred to as the 'cognitive niche', but the evolutionary psychologists who invented this expression (Tooby and DeVore 1987) did so in pursuit of their own particular agenda. Adherents of the 'cognitive revolution' but attempting to marry a reluctant Chomsky to their own mentalist version of Darwin, they are committed to minimizing the intrinsically social, cultural and institutional nature of the digital semantic representations made available to our brains. The expression 'cognitive niche' may have explanatory value, but not if the purpose is to prioritize 'nature' at the expense of what social anthropologists and archaeologists term 'symbolic culture.' Contrary to Tooby and DeVore (1987), the 'cognitive niche' doesn't actually exist 'in nature.' No one has ever found such a niche 'in nature.' As Tomasello (1999) points out, distinctively human cognition is rooted in *culture.* The 'cognitive niche', to be precise, exists only as an internal feature of *human symbolic culture.*

So what exactly is this thing called 'symbolic culture'? Following the philosopher John Searle (1996), let's begin by drawing a distinction between 'brute facts' and 'institutional facts'. Birth, sex and death are facts anyway,

irrespective of what people think or believe. These, then, are brute facts. Phenomena such as legitimacy, marriage and inheritance, however, *are facts only if people believe in them.* Suspend the belief and the facts correspondingly dissolve. But although institutional facts rest on human belief, that doesn't make them mere distortions or hallucinations. Take two five-pound banknotes. Their monetary equivalence to one ten pound note is not merely a subjective belief: it's an objective, indisputable fact. But now imagine a collapse of confidence in the currency. Suddenly, the various bits of paper are worthless – the former facts have dissolved.

Institutional facts are not necessarily dependent on verbal language: one can play chess, use an abacus or change money without using language. The relevant digits are then the chess pieces, beads or coins that function as markers in place of any linguistic markers. Facts of this kind – the intricacies of the global currency system, for example – are patently non-physical and non-biological. We may think of them as internal features of an all-encompassing game of 'let's pretend'. Needless to say, institutional facts presuppose a brain with certain innate capacities, syntactical language being one possible manifestation of these capacities. But as Tomasello (2006) points out, explaining distinctively human cognition by invoking 'language' is circular and unhelpful: it is precisely language that we need to explain.

When people coin a new word – 'spam' to mean 'bulk e-mail' is a recent example – it becomes established as an institutional fact. Whether linguistic or non-linguistic, facts of this kind develop ontogenetically out of the distinctively human capacity for mindreading, joint attention and 'let's pretend'. The underlying formula is 'Let X count for us as Y' (Searle 1996). Using a broomstick to signify 'horse' is in principle no different from using 'spam' to signify 'bulk e-mail'. When children learn the meanings of words, they succeed not thanks to a word-learning module dedicated exclusively to this task but by drawing on more fundamental and empirically verifiable features of social and non-social cognition (Bloom 2000). In particular, learning the meaning of a word presupposes the ability to correlate perspectives, grasping others' referential intentions. It is this imaginative ability – the ability to infer and share intentions and goals – that distinguishes human cognition so radically from that of apes (Tomasello et al. 2005).

Of course, it is always possible to term this critical ability 'language'. This might seem helpful if you consider language to be an innate mechanism

operating independently of the rest of cognition or of any institutional setting. Chomsky does hold this view, treating language as a faculty no different in principle from walking or stereoscopic vision. Pinker sets out from essentially the same position: language, he says, should be studied on the model of echolocation in bats or stereoscopic vision in primates. Distancing himself from Chomsky, however, Pinker insists that language is specifically designed for a social function – namely, for communicating thoughts. Pinker explores how 'words and rules' are continuously invented and re-invented for this purpose. In Searle's terms, the results of this social process are 'institutional facts.' Pinker calls them 'inventions'. But if they are indeed inventions, Chomsky's foundational assumption must be wrong. Language cannot be understood simply as a biological object. It operates on an entirely different level of organizational complexity from walking or stereoscopic vision – mechanisms, which, after all, don't require institutional arrangements in order to work.

What would language consist of in the absence of institutional facts? What meaning would language have to a child deprived of 'words and rules'? According to Chomsky, the first human to be endowed with language used it to 'articulate to itself its thoughts'. As he explains (Chomsky 2002: 148):

> 'Actually you can use language even if you are the only person in the universe with language, and in fact it would even have adaptive advantage. If one person suddenly got the language faculty, that person would have great advantages; the person could think, could articulate to itself its thoughts, could plan, could sharpen, and develop thinking as we do in inner speech, which has a big effect on our lives. Inner speech is most of speech. Almost all the use of language is to oneself, and it can be useful for all kinds of purposes (it can also be harmful, as we all know): figure out what you are going to do, plan, clarify your thoughts, whatever. So if one organism just happens to gain a language capacity, it might have reproductive advantages, enormous ones. And if it happened to proliferate in a further generation, they all would have it'.

But if communication was inessential, what need was there for any kind of external transmission via phonology? And if there was no such transmission, how could syntax have interfaced between Phonetic Form and Logical Form? After all, there would have been no Phonetic Form. Finally, if we accept that language can exist when stripped of this interface – when stripped of syntax as Chomsky (2005) himself defines it – in what sense does the residue deserve to be called 'language'? Why not just call it 'mentalese' or 'thought'?

Pinker (1999: 287) concludes his book on 'the ingredients of language': 'It is surely no coincidence that the species that invented numbers, ranks, kinship terms, life stages, legal and illegal acts, and scientific theories also invented

grammatical sentences and regular past tense forms'. Confusing correlation with causation, Pinker here treats the supposedly digital concepts intrinsic to human nature as responsible for the legalistic distinctions of human culture. Note, however, that the digital concepts he actually mentions here – whether linguistic or non-linguistic – belong without exception not to individual cognition but to the realm of *agreements* and *institutions*. This is perhaps not a coincidence – after all, we possess no evidence that language would be possible at all outside such institutional settings. Reversing Chomsky – and correspondingly reversing the whole idea of 'digital minds in an analog world' – we can conclude that 'doing things with words' (cf. Austin 1978 [1955]) is invariably more than just activating a biological organ. To produce 'speech acts' (Searle 1969) is to make moves in a non-biological realm – a realm of facts whose existence depends entirely on collective belief.

3. The evolution of deep social mind

Evolutionary psychologists often refer to the evolution of 'deep social mind' (Whiten 1999). By this, they mean the kind of mind that cannot be restricted to one individual. Deep social mind is recursive – mind as represented in other minds, and as it represents to itself such representations. There is a subtle difference between this idea and the theory that thought is dependent on language. 'No support can be found for the view that words are necessary for thought', writes Bloom (2000) in his exhaustive study of how children learn the meanings of words. But if words are not necessary for thought, in what sense can 'language' be said to be necessary for thought?

To appreciate why it is so unhelpful to privilege language as the source of uniquely human cognition, let's take the case of pointing (Tomasello 2006). Intentional pointing begins in children at about 14 months; chimpanzees never reach this stage. Pointing would seem to be a relatively simple activity, not requiring much in terms of computational hardware. Since it appears so simple, why don't chimps do it?

One answer might be that Universal Grammar is required – and chimps don't have Universal Grammar. But that would surely be absurd: pointing doesn't depend on any kind of grammar. It is true that whatever cognitive abilities enable pointing are necessary to enable talking as well, but that is no excuse for attributing evolutionary priority to language. Tomasello (2006: 520) concludes:

> ‘To explain human cognitive uniqueness, many theorists invoke language. This contains an element of truth, because only humans use language and it is clearly important to, indeed constitutive of, uniquely human cognition in many ways. However, ….asking why only humans use language is like asking why only humans build skyscrapers, when the fact is that only humans, among primates, build freestanding shelters at all. And so for my money, at our current level of understanding, asking why apes do not have language may not be our most productive question. A much more productive question, and one that can currently lead us to much more interesting lines of empirical research, is asking the question why apes do not even point.’

So why don’t apes point? Tomasello offers a social explanation. Regardless of whatever mindreading abilities apes possess, in their natural environment they lack any *motive* to correlate perspectives or share goals. They are by nature competitive. Only quite peculiarly cooperative creatures motivated to share *goals* and *intentions* could have any reason to point – or any reason to go yet further and invent ‘words and rules’.

When fictional representations are given public and observable form – as in a game of ‘let’s pretend’ – language has started to evolve. Scaled up from the level of children’s games and extended across society as a whole, ‘let’s pretend’ may generate a whole system of ritual and religion (Durkheim 1947 [1915]; Knight 1998, 1999, 2000a, 2000b; Power 1999, 2000). The morally authoritative intangibles internal to a symbolic community – that is, to a domain of ‘institutional facts’ – are always on some level digital. This has nothing to do with the supposedly digital genetic architecture of the human brain. The explanation is less mystical. It is simply that institutional facts depend entirely on social agreement – and you cannot reach agreement on a slippery slope. What would it mean if the Queen in her official capacity were to ‘open Parliament’, but only slightly? Or if a couple who had just made their wedding vows were pronounced man and wife – but only ‘more or less’?

What applies to royal and religious edicts applies to semantic distinctions in general. Chomsky notwithstanding, semantic distinctions are social and institutional, not individual or innate. Take the classic case of basic colour terms. All humans, in all cultures, discriminate perceptually between an immense variety of different hues. But while actual colours can be directly perceived – and while innate biases play a key role in determining which regions of the spectrum are picked out – it need hardly be stressed that digital colour *categories* operate on a quite different level. Knowing that the spectrum is segmented into two, three or some other limited set of ‘colours’ – ‘the seven colours of the rainbow’, for example – requires access to the relevant

institutional conventions. Basic colour terms – English 'red' and 'green', for example – map directly to these simplified abstractions; they do not and could not possibly map to the vastly more complex features of the human visual system as such (Davidoff 2001; Davidoff et al. 1999; Steels and Belpaeme 2005). To summarize: by definition, anything perceptible can be evaluated and identified through direct sensory input – in other words, on the basis of innate perceptual mechanisms. But institutional intangibles are inaccessible to the senses. Being invisible, intangible and in a fundamental sense unreal, they can be narrowed down and agreed upon only through a process in which abstract possibilities are successively eliminated. 'Discrete infinity' captures the recursive principle involved.

The sound system of a language – its phonology – is prototypically digital. It is no more possible to compromise between the *t* and the *d* of *tin* versus *din* than to compromise between 11:59 and 12.00 on the face of a digital clock. Of course, categorical perception is common enough in nature. But the meaningless contrastive phonemes of human language comprise only one digital level out of the two that are essential if meanings are to be conveyed at all. Combining and recombining phonemes – 'phonological syntax', as it is called by ornithologists (e.g. Marler 1998) who study the digital phenomenon in songbirds – would be informationally irrelevant if it did not interface with a second digital level, which is the one necessary if *semantic* meanings are to be specified. No animal species has access to this second level of digital structure. It would therefore be inconceivable and in principle useless anyway for an animal to make use of syntactical operations – whether Merge or anything else – in order to interface between the two digital levels. The explanation is that animals inhabit just their own biological world and therefore don't have access to the extra digital level. It is the nature and evolution of the entire second level – the level of symbolic culture – that has proved so difficult a puzzle. Explaining 'the Great Leap Forward' as an outcome of 'Merge' is a parsimonious solution (Chomsky 2005), but only in the sense that explaining it as an outcome of divine intervention might seem persuasive in terms of parsimony although less so in terms of testability.

4. A Darwinian solution

The alternative is to conceptualize the language capacity as one remarkable manifestation of a 'play capacity' continuous with its primate counterparts but let loose among humans in a manner not open to other animals (cf. Huizinga 1970 [1949]; Jespersen 1922; Knight 2000b). The development of play and the development of language in children are widely recognized as isomorphic. They have the same critical period, the same features of intersubjectivity and joint attention, the same triadic ('do you see what I see?') referential structure and the same cognitive expressivity and independence of external stimuli. It is unlikely that these parallels are a pure coincidence (Bruner et al. 1976; Trevarthen 1979; Tomasello 2003).

'Digital infinity' corresponds to what developmental psychologists might recognize as a children's game – in this case, 'let's play infinite trust'. Take any patent fiction and let's run with it and see where it leads. Metaphorical usage is an example of this. A metaphor 'is, literally, a false statement' (Davidson 1979). React on a literal level – as an autistic person might do – and the signaler is rebuffed, denied the freedom to 'lie'. But most of us don't react in this unimaginative and unsympathetic way: by accepting the patent fiction and sharing in it, we can construct it as truth on a higher level – truth for 'our own' joint purposes of conceptualization and communication. A red dress is not necessarily 'bloody' – but identifying it that way might pick out one particular garment from a range of possible alternatives. As literal falsehoods become gradually conventionalized, one possible trajectory is that they crystallize out as 'dead metaphors' – familiar terms whose original metaphoric meanings have become forgotten. Grammatical markers and associated constructions are historical outcomes of essentially similar processes that are now well understood (Meillet 1903; Lakoff and Johnson 1980; Heine et al. 1991; Gentner et al. 2001; for an excellent recent overview see Deutscher 2005).

If all this is accepted, it follows that for words and rules to evolve, humans must trust one another sufficiently to find value in patent falsehoods. It is for social reasons that non-human primates are unable to do this. Chimpanzees, for example, are powerfully motivated to read one another's minds. But like devious spies, they have no reason to assist potential rivals in reading *their own* minds. Where a volitional signal *is* cooperative – as in a simple 'pointing' gesture – no chimpanzee is intuitively able to 'get it'. As if anticipating Machiavellian cunning, the confused recipient can't trust or even make sense of

the helpful communicative intention behind the gesture (Hare and Tomasello 2004). In the primate case, resistance to deception blocks the possibility of one animal accepting on trust the potentially misleading signal of another. Among other consequences, this blocks the use of metaphor – and in so doing blocks the elaboration of abstract conceptual thought. If animals don't talk, therefore, it's not because they lack the necessary digital computer installed inside their brains. The explanation is more simple: they live in a Darwinian world. Animals value signals to the extent that they are dependable, hence hard to fake. Only body language has this property. Intentionally produced symbols are rejected because they might always prove false.

The social factors that in humans allow metaphorical usage are equally the ones permitting digital concepts to evolve. Hard-to-fake indices such as laughs, sobs, cries and so forth must be evaluated for intrinsic quality on an analog scale. While compatible with bodily displays, this analog principle of evaluation is just not compatible with the processing of abstract digits. It therefore rules out even the theoretical possibility of Merge. Conversely, analog evaluation just *cannot* be applied to the processing of patent fictions. Regardless of innate cognitive architecture, the contrastive possible intentions behind a communicative fiction are *in principle* not subject to analog evaluation. 'Discrete infinity' becomes unavoidable in this context because linguistic signs are 'honest fakes' – literal irrelevancies and falsehoods, significant only as cues to the intentions underlying them. Since communicative intentions are intangibles, processing them has to be digital by reason of conceptual necessity, not because the brain or any part of it is innately digital.

'Animals,' Durkheim (1947: 421) long ago observed,

> 'know only one world, the one which they perceive by experience, internal as well as external. Men alone have the faculty of conceiving the ideal, of adding something to the real. Now where does this singular privilege come from?'

Maynard Smith and Szathmáry (1995) offered a bold Darwinian answer to Durkheim's question, citing Rousseau and viewing the puzzle of language origins as inseparable from the wider problem of explaining the emergence of life governed by morally binding contracts. Their 'major transitions' paradigm is ambitious and conceptually unifying, assuming no unbridgeable chasm between natural and social science. The same applies to the paradigm being developed by Steels and his colleagues (Steels et al. 2002), who use robots to show how shared lexicons and grammars – patterns far too complex to be installed in advance in each individual brain – spontaneously self-organize through

processes of learning, recruitment, social co-ordination and cumulative grammaticalization. By maintaining continuity with primate analog minds while introducing novel social factors, we can continue to apply basic principles of Darwinian behavioural ecology to account for the emergence of distinctively human cognition and communication.

'Analog minds in a digital world' is fully compatible with Darwinian evolutionary theory. 'Digital minds in an analog world' is not compatible at all. Installation of an innate digital mind – whether instantaneous or gradual – is a *deus ex machina* with nothing Darwinian about it. A model of language evolution, to qualify as scientific, cannot invent fundamental axioms as it goes along. It cannot invoke currently unknown physical or other natural laws. It should be framed within a coherent, well-tried body of theory; it should generate predictions that are testable in the light of appropriate empirical data; and it should enable us to relate hitherto unrelated disciplinary fields. Whereas the *deus ex machina* approach rejects the accumulated achievements of social science, the play/mindreading/joint attention paradigm (Tomasello 1996, 1999, 2003, 2006; Tomasello et al. 2005) has the potential to link the natural and social sciences in a theory of everything.

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