Human uniqueness and the pursuit of knowledge: a naturalistic account

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1. Human uniqueness

Despite the widespread acceptance of naturalism in many of the human sciences, discussions of the extent to which human beings are 'unique' are still common among philosophers and scientists. Cognitive ethologists and comparative psychologists often defend a standard view of this question by quoting Darwin's famous claims in *The Descent of Man* that 'there is no fundamental difference between man and the higher mammals in their mental faculties' and that all the differences are 'differences of degree, not of kind' (Darwin 1871: 35).

Darwin's claim is sometimes taken as a simple consequence of the theory of evolution by natural selection. Indeed, David Premack has commented that 'Darwin's opinion has been so closely linked with evolutionary theory that it has been virtually impossible to contest his opinion while supporting evolutionary theory' (Premack 2010: 22). But of course, whether this is so all depends on what 'fundamental', 'degree' and 'kind' mean. If a fundamental difference is the kind that (e.g.) Descartes thought existed between humans and animals, then of course Darwin is right, and to disagree with him would surely be to dispute evolutionary theory. But if a fundamental difference is just an *important* difference, or a *significant* difference, or a scientifically or philosophically *interesting* difference, then Darwin's claim is surely not true.

To illustrate, here is an uncompromising statement of obvious and fundamental differences between humans and other animals:

> Human animals – and no other – build fires and wheels, diagnose each other's illnesses, communicate using symbols, navigate with maps, risk their lives for ideals, collaborate with each other, explain the world in terms of hypothetical causes, punish strangers for breaking rules, imagine impossible scenarios, and teach each other how to do all of the above. (Penn, Holyoak and Povinelli 2008: 109)

Are these differences between humans and other animals differences of 'kind' or differences of 'degree'? The question is obscure. Of course, if we can identify the stages by which the complex capacities mentioned above evolved from simpler capacities by the well-understood mechanisms of natural selection, then there would be some point in saying that these differences are differences of degree. But I assume that we are not in a position to do this. And clearly if anything counts as a 'difference in kind' in this area it is the difference between these forms of human communication and (e.g.) the bee dance. To echo something Daniel Dennett said at the conference from which this volume derives: if the difference between the bee dance and human communication is a difference in degree, then these degrees differ enormously in kind. Saying these are differences of kind might mislead, of course, if it were to suggest that some deep ontological distinction (like Descartes's) is in question. But many or most naturalists will reject such distinctions. A better approach for a naturalist is to stop talking in terms of the contrast between 'differences of kind' and 'differences of degree'.

In this paper, I want to approach the question of human uniqueness from a slightly different angle, focusing on the distinctive character of human epistemic

endeavour. First I will argue that human beings have the ability to pursue knowledge for its own sake; and that it is far from obvious that other animals exhibit this ability. Second, I will detect a pattern in some of the empirical results about human and animal learning, communication and thought, which might help us identify the basis for this ability, an ability which is arguably unique to humans. The distinctiveness here should not lead us to posit an ontological gap between humans and other animals; but the evidence lends little support to the idea that it is 'just' a matter of degree. The idea that the 'pure' or 'disinterested' pursuit of truth or knowledge might be characteristic of human beings is not, I think new; but what might be new is the attempt to support it by using empirical evidence.

2. Knowledge for its own sake

Aristotle begins his *Metaphysics* with the famous sentence, 'All men by nature desire to know'. He goes on to say that 'an indication of this is the delight we take in our senses, for even apart from their usefulness they are loved for themselves'. He then contrasts the way other animals 'live by appearances and memories' but 'the human race lives by art and reasoning'. Knowledge and understanding 'belong to art rather than to experience', because art, not experience, teaches you the 'why' of things ('art' here is *techne*: 'skill' might be more accurate). Jonathan Lear argues that when Aristotle says that by nature we desire to know, he was referring to the desire to know for its own sake (Lear 1988: 1-3). Lear argues that 'for Aristotle … we are led to the pursuit of explanations for their own sake both by our natural makeup – the desire to know – and because it is part of our nature to find the world puzzling' (Lear 1988: 5).

This raises two questions. First, is it true that we have the desire to know for its own sake? And second, what does it mean to say that the pursuit of such explanations is part of our 'natural make-up'? In this section, I will answer the first question, and in the next section the second.

To talk about the 'sake' for which someone does something is to identify the end or purpose of the action. The end of an action might be something that the agent values, and this thing can be of instrumental value – i.e. useful, because it is the means to some further end – or because it is valuable in itself. The distinction between instrumental and intrinsic value is, of course, a subject of intense debate within moral philosophy and the theory of value; but here I will take it for granted and concentrate on its application to the case of knowledge.

Human beings and other animals actively seek information about the world, and we label the state of having received this information 'knowledge'. It's a good question why we have the distinction between *knowledge* and *true belief* or *opinion*. I agree with those who say that we seek knowledge and not merely true belief (or correct representation) because we are looking for strategies to avoid error (see Williams 1978, Papineau 1992). But even given this, our search for knowledge can be for many different purposes. A piece of knowledge might be valuable because of some further purpose or good it might serve, or it might be something which is an end in itself.

So, for example, we can distinguish someone's having a purely instrumental interest in the stars – for example to aid navigation at sea – and having an interest in the stars for its own sake. An instrumental interest in the stars is different from the interest of someone who simply wants to know about the constellation of Orion, or

who wants to know how far away certain stars are, or which stars are brighter. On the face of it, this kind of knowledge need not be put at the service of any practical project, but is simply something that is pursued for its own sake.

I hope that this will strike readers as fairly obvious on the face of it. But some philosophers might dismiss the distinction I have just made between instrumental knowledge and knowledge for its own sake. They might say that even in the case where someone simply wants to look at the skies, their knowledge is instrumental because it its role is to satisfy the desires of the agent: the desire to look at the stars. Any agent who wants to know something has some desires – notably the desire to know these things – and these desires would be satisfied by the achievement of knowledge. Since the search for knowledge is always driven by the desire – as perhaps all searches are, if Aristotle is right that 'thought by itself moves nothing' – then this knowledge would be instrumental too, in the sense that its role is to satisfy the desire for knowledge.

Perhaps everyone should concede that all knowledge is instrumental in this anodyne sense. But if we insist that this is the only sense in which all knowledge is instrumental, then we will miss an important distinction. The distinction we need is between knowledge which is pursued because of the desire for knowledge on that subject-matter as such, and knowledge which is pursued because it will help some aim or purpose *distinct* from the desire to know.

Some philosophical and psychological accounts of thought treat all thought as instrumental in a more substantial way than this trivializing manoeuvre does. This is a way of reading some versions of evolutionary psychology. In general terms, evolutionary psychology looks for explanations of human cognitive capacities as

adaptations, that is as developments across generations of those traits which have enhanced the fitness of organisms (for the general idea, see Barkow, Cosmides and Tooby 1992). A more specific version of this view could say that the cognitive capacity which aims at the representation of the world is an adaptation, and that in this sense the products of this capacity have a 'purpose' which is fitness. So what representations of the world are 'for' is simply to enhance fitness, and this is what they are 'pursued for': there are no representations which are pursued for their own sake.

To defend my distinction, I need not reject the central thesis of evolutionary psychology, which is that (some or all) psychological capacities are adaptations. Nor need I reject the claim that the capacity for knowledge (or correct representation) is an adaptation. It might be an adaptation; but the point is that this does not imply that the reason someone pursues this goal is to enhance the fitness of their offspring. There is a difference between the evolutionary reason why the capacity is there in the first place and the reason for which any individual exercises this capacity.

Other accounts of thought attempt to ground all thought on the satisfaction of desire. In a famous paper, F.P. Ramsey described a view he called 'pragmatism': that beliefs could be characterized by their effects in action. The idea (similar to what later came to be called 'functionalism') is that because what we do is fixed in part by what we believe and what we want, we should attempt to understand believing and wanting as dispositions to act in certain ways. Ramsey went further, and attempted to define what it is to believe one thing rather than another in terms of the actions they would give rise to in certain circumstances. He illustrated this with the simple case of a chicken: 'We can say that a chicken believes a certain sort of caterpillar to be

poisonous, and mean by that merely that it abstains from eating such caterpillars on account of unpleasant experiences connected with them'. Generalising from this, he defines a belief in terms of the actions it would cause, and the 'content' of a belief (labeled with the letter 'p') in terms of its utility: 'any set of actions for whose utility *p* is a necessary and sufficient condition might be called a belief that *p*, and so would be true if *p*, i.e. if they were useful' (Ramsey 1927: 40).

Ramsey's view that beliefs should be understood in terms of their utility is a version of the view that all thought is instrumental. J.T. Whyte (1990) labeled this view 'success semantics', and it has been defended by a number of philosophers (for discussion see Blackburn 2005,Mellor 2012). Beliefs are said to be distinguished by their 'truth-conditions': the conditions under which they are true. So for example, my belief that the sun is shining is the belief it is because the belief is true in just those conditions in which the sun is shining. Success semantics says that the *truth*-conditions of a belief are its *success* conditions: the conditions under which actions based on it would succeed, where success is understood as the satisfaction of wants or desires. So, if what I want is to walk to the river but I only want to do it if the sun is shining, then my desire and my belief will cause me to attempt to achieve that. The conditions under which the belief is true are the conditions under which actions based on it succeed. It follows that belief (and therefore thought in my sense) must be defined instrumentally in terms of possible success of actions.

I don't want to deny that this kind of relationship between belief, desire and action may hold for many actions and mental states (not just the kinds that we might credit to chickens, but to human beings too). The relation between the success of our actions – the achievement of our objectives or goals – and the truth of our beliefs

must be an essential part of the whole story. But since it characterizes the truth-conditions of a belief in terms of the success-conditions of a desire, it owes us an account of the satisfaction conditions of desires. The satisfaction of a desire cannot simply be the cessation of desire, as Russell once thought; for a desire can cease even if it is not satisfied. Rather, the satisfaction of desire must be what Whyte calls its *fulfillment:* bringing about a certain condition. But if bringing about this condition cannot be understood except in terms of the truth of a proposition, then this is what we are trying to explain. The problem is especially acute when the desires concern desires to find out something for its own sake: for in this case, the satisfaction of a desire just *is* the acquisition of a true belief. We are moving around in a very small circle.

Although they both contain important insights, neither the evolutionary psychological approach nor the 'success' approach eliminates the reality of the phenomenon of pursuing knowledge for its own sake. Even if it is true that our cognitive capacities are adaptations, this does not imply that each exercise of this capacity is performed for the reason that the capacity came about. And the 'success' approach cannot work without an account of the fulfillment of desire which is independent of the account of the content of beliefs.

What more can we say about this phenomenon of the pursuit of knowledge for its own sake? First, it is important to emphasise that to want to know something for its own sake is not to want it *because it is true* – if 'because it is true' is supposed to be an intelligible answer to the question 'why do you want to know that?' Jane Heal puts this point well, when discussing the idea that 'the disinterested search for truth' might be a value in itself:

> When someone claims that information on a certain topic would be a good thing one can always ask "Why do you want to know about that?" An intelligible answer will have to say something about that particular subject matter. It cannot simply point back to the fact that the item in question would be a specimen of true belief. (Heal 1988: 107)

But, Heal goes on, just because being 'true' can never be an intelligible answer to the question, this does not mean that an intelligible answer must always be to specify some practical project:

> to say that an answer [to the question, 'why do you want to know about that?'] must be forthcoming is not to say that the form of the answer must involve reference to some practical project in immediate or distant contemplation. (Heal 1988: 107)

Heal here points out the false contrast between the illusory idea that one might simply search for truth 'as such', just because it is true, and the perfectly correct idea that our beliefs and desires often serve our practical needs. There is, as she indicates, a third option: one I would describe as being interested in the truth about a certain subject-matter for its own sake.

When one is investigating a subject matter for its own sake, one is not pursuing the truth 'just because it is true'; but nonetheless, one must think of oneself as governed by the norm or standard of *getting it right*. The amateur star-gazer who plots the changing positions of the stars over the year is doing it because of an interest in the stars, but if asked to reflect on what he is aiming to do, he might answer that he just wants to find out – to know – how things are up there. If we accept the reason given above for distinguishing between knowledge and true belief – that we want a

method that cannot easily go wrong, or that we want a method for avoiding error – then the search for knowledge involves essentially the attempt to avoid error. But if you are going to explicitly try and avoid error, you need to have the concept of error.

At this stage it might be objected that the line of thought I have been developing has ignored the obvious difference between human and animal thought: the fact that our thought, unlike theirs, is expressed in language. And of course, this is an obvious difference. (Let's ignore here the evidence from so-called 'linguistic apes', which accordingly to one recent authority is 'mostly anecdotal, lacking in systematic detail and often involves over-interpretation' Gómez 2008: 590.) In any case, what is uncontroversial is that we are the only species who develop language in the course of normal ontogenetic development. But what is the significance of this difference for our understanding of thought? Does language simply make possible a more complex kind of thought or is there some difference of *kind* that language provides?

Descartes is famous for having denied thought to animals, partly on the grounds that they could not speak. In the 20th century, Donald Davidson (himself hardly a natural Cartesian) agreed with Descartes. Davidson's idea was that to be a thinker is to be the interpreter of the thought of another, which essentially involves employing a language (Davidson 1983). So non-linguistic animals cannot think. Why does he think this?

Davidson's argument focuses on what it is to have a *belief*. It is based on two assumptions: first, that in order to have a belief, one must have the concept of belief; and second, that to have the concept of belief, one must have language. It is a consequence of this that any creature which has beliefs must have a language. The more detailed line of thought is that to have the concept of belief requires mastering

the distinction between how things seem and how they are. Davidson argues that language would suffice for making this distinction, and conjectures that nothing else would make it.

Davidson's argument is controversial and has persuaded few. In particular, the premise that one can only have beliefs if one has the concept of belief is crucially unsupported, and without that, there is no reason to accept his conclusion, and no reason to deny thought to non-linguistic animals. In the relevant sense, a belief can be a simple representational state, which Ramsey's chicken can have. We can call the chicken's belief a belief *that chickens are poisonous* if we like, but this does not require that we attribute to the chicken the 'concept' of poison. Calling this a belief is just a way of indicating that the chicken represents the world in a way that guides its actions, and in way that can be correct or incorrect.

In order to have this 'belief' the chicken needs no beliefs *about* its beliefs. For example, it need not be *surprised* if it eats a caterpillar and does not have an unpleasant experience. It need not discover that it was wrong. It just moves on, updating its representations accordingly. Being surprised, Davidson argues, requires that one distinguishes between how one previously thought the world was, and how one now discovers it is. I think Davidson is quite right about that. But he is wrong to think that being a believer requires that one is capable of surprise.

However, although Davidson's argument fails, it contains something which gives us a clue as to how to answer our question: what does language add to thought? (Or, what kind of thought does language make possible?) Davidson argued that having the concept of belief involves making the distinction between how things seem and how they are. This amounts to having the concept of error. It is clear that the way

mature humans normally represent others as being correct or incorrect is showing agreement or assent, or by using the words for these things, ‘correct’ or ‘incorrect’. This suggests to me that Davidson was on the right track to think that there is a link between having the concept of belief and having a language. The link is this: it is when a creature has a language that it can easily and systematically represent the beliefs of others as being correct or incorrect. Children can do it at the age of four or five. Without language, it is very hard to see how they could do this. Very hard: I do not say impossible. But like Davidson, I cannot clearly see any other way in which it can be done.

The significance of language, on this view of things, is not simply that it allows us to communicate, or even that it allows a more sophisticated kind of communication – although both these things are true. The other extra thing that language gives us is that it facilitates and gives us a mechanism to articulate the correctness and incorrectness of the thoughts of others. As Daniel Dennett has put it (1988), we are ‘reason-representers’: we don’t just act on reasons, but we represent reasons to ourselves and to others. In doing so, we can evaluate our and their reasons as good or bad; as accurate or erroneous. Seeing ourselves as in the pursuit of knowledge for its own sake requires having the concept of error.

3. A naturalistic approach

These remarks are phenomenological (or what Dennett calls heterophenomenological) observations – about how we talk and think about our minds and the minds of others. To establish whether this capacity is *actually* part of our nature, as Aristotle claimed, as opposed to being some kind of illusion, we need to examine the evidence from

human psychology and comparative psychology. This is of course a huge task, and I do not pretend to say anything conclusive here. The purpose of this paper is to suggest at a relatively abstract level how some of the evidence might be used to support the hypothesis that the capacity to pursue knowledge for its own sake is part of human nature, and that it is not shared by other animals. My hope is that this might provide a fruitful way of looking at some debates in comparative psychology.

Discussions of whether certain psychological traits are unique to humans have tended to focus on a number of traits: human communication (especially the role of language); the distinctive character of human social cognition (especially in connection with so-called 'theory of mind'); the human ability to perform analogical reasoning; and the distinctive imitative abilities of humans and its role in learning (see Premack 2010). Here I will make some remarks about the evidence about communication, theory of mind, imitation and learning. (I will ignore the question of analogical reasoning in this paper.)

First, communication. Obviously, language is the distinctive mechanism of human communication, and in the previous section I proposed that language facilitates the pursuit of knowledge for its own sake by giving us the means to represent error in ourselves and others. But what about other forms of communication? Does the evidence about other forms of communication touch on the question of knowledge for its own sake?

Consider what is known as 'referential communication' in humans and animals – that is, communication with other creatures about objects in the environment. A classic paradigm of referential communication in animals is the alarm calls of vervet monkeys, as revealed in the pioneering studies of Cheney and Seyfarth

(1990). Vervet monkeys in the wild employ a number of distinct calls to indicate to other monkeys the presence of different kinds of predator. The hypothesis that this is *referential* communication is the hypothesis that these animals are communicating not about their inner states (fear, anger or something like that) or trying to command other monkeys to do things ('flee!' 'Run for it!' and so on). Rather, the monkeys are aiming to inform other monkeys of something in their environment – which predator is coming – so that the others will be able to take the appropriate evasive action (run up a tree if it is a leopard, hide under a bush if it is an eagle etc).

Of course, it is a real question what the content of the referential intention is, if we agree that it is referential at all. But it is plausible that if there is a communicative intention involved, the aim is to bring about some change in the environment, some change in the situation of the monkey's conspecific. If there is thinking going on, then, it is instrumental or means-end thinking. The vervets' communication is geared to specific, immediate goals and very 'domain-specific' tasks: getting food, avoiding predators, mating etc. So one question for researchers on referential communication is whether there are experiments which would establish that there referential communication exhibits the expression of knowledge for its own sake. There are severe methodological difficulties here, since acquiring robust evidence about animals' cognitive capacities in the wild is incredibly difficult, and in captivity experiments are often tied to specific rewards and benefits.

Here it is relevant to consider the evidence about non-linguistic communicative devices, notably pointing. Among human infants, there are two kinds of pointing (Tomasello 2006). Infants point when they want something, or want an adult to give them something ('juice!'). This is 'imperative' pointing. But they also

point when they want to share attention with an adult, to draw their attention to something in the environment – this is 'declarative' pointing (the kind of pointing we might think of as expressing the child saying 'look at that!').

What is known about pointing in other animals? Attempts to discern pointing in apes has met with mixed success. There seems to be almost no evidence of pointing in the wild, although some apes who have lived with humans occasionally point imperatively. But there is no evidence of *declarative* pointing in apes, anywhere, at any time. As Michael Tomasello says, 'no apes in any kind of environment produce, either for other apes or for humans, acts of pointing that serve functions other than the imperative functions' (Tomasello 2008: 37-8).

What about the recognition of human attempts to communicate by pointing? Dogs, who have evolved alongside human beings for at least the last 15,000 years, are sensitive to human attempts to communicate (and interestingly, wolves – even those reared by humans – do not seem to be). But dogs' sensitivity to human communication is limited to very specific features of the communicational context. As Pierre Jacob puts it, 'in dogs, the sensitivity to ostensive communicative signals seems tied to particular individuals and primarily hooked to a motivational system whose goal is to satisfy human orders' (Jacob 2010). Again it seems that the ability to recognize the situation as a communicative one is tied to the immediate effects of such recognition – rewards or other outcomes from the human with whom they are communicating.

Human infants, by contrast, point declaratively from an early age. A bold speculation is that declarative pointing in children is what one might expect to see if there were something like a psychological mechanism of 'pure curiosity' in human

beings. For unlike instrumental pointing, declarative pointing seems to manifest a sheer interest in something with no especial need for a practical upshot (as Aristotle said, 'not only with a view to action, but *even when we are not going to do anything*, we prefer seeing (one might say) to everything else'). But it must be explicitly acknowledged that this is a conclusion that goes a long way beyond the current evidence about pointing and the understanding of pointing gestures. The least we can conclude at this stage is that there is no evidence at the moment from studies of animal communication that referential communication and pointing are for anything other than the exchange of information about the immediate environment.

Of course, one of the principal human communicative mechanisms is language, and language has a special role in the second area where humans are supposed to be unique, namely social cognition. I claimed in section 2 that language plays a particular role in the pursuit of knowledge for its own sake: it enables us to represent ourselves and others as being in error. Is there any evidence that animals have the ability to represent other creatures as being in error? I want to suggest that the answer is no.

In 1978 David Premack and Guy Woodruff asked the question, 'Does the chimpanzee have a theory of mind?' Having a 'theory' of mind in this sense is just having a conception of other creatures' mental states. The first question for psychologists is whether apes (and other non-human animals) have a conception or some kind of understanding of the minds of other creatures at all. The issue is controversial, and I do not attempt to address it here. Rather, I assume here for the sake of argument that chimps (and some others) have a conception of the minds of others. My question is: what kind of theory of mind do they have? What kinds of

mental states are they capable of representing? Some evidence suggests that chimps have beliefs about what other chimps can *know* or *see*, but there is no evidence that they have beliefs about what other chimps *believe*. And if they cannot form beliefs about what other chimps believe, they cannot have the concept of error – if the claims of section 2 are correct.

In a well-known study, Brian Hare *et al* (2000) provided evidence that chimpanzees can apparently know what other chimpanzees can see, and therefore what they know. The essence of the experimental paradigm involved a dominant and a subservient chimp, and two situations. In the first situation, food was placed accessibly in front of the subservient chimp in full view of the dominant chimp; the subservient chimp did not move. In the second situation, an opaque barrier was placed between the dominant and the subservient, so that the food could not be seen by the dominant; in this case, the subservient chimp took the food. The proposed explanation is that in the second situation, the subservient chimp knew that the dominant ape could not see the food.

The result has been challenged (e.g. by Karin-D'Arcy and Povinelli 2002, and others) and is still controversial; so once again the conclusion I want to draw is conditional at best. The conclusion I would like to draw from the experiments of Hare *et al*, is that even if chimps can know what other chimps can or cannot see, and therefore what they do or do not know, there is no evidence from these (and related experiments) that chimps know what other chimps *believe*. The distinction we need here is the distinction between ignorance and error. The subordinate chimp knew that the dominant chimp could not see the food – that it was *ignorant* of this fact. There is no evidence that they show any awareness of the mental states being *correct* or

incorrect. The mental states that this experimental paradigm reveals are what we might call *relational* mental states: knowledge, seeing, wanting (some of these are also factive, but relational is the broader category). These are states of mind that relate the thinker to the environment, and so cannot, in a certain sense, be wrong. Beliefs, on the other hand, are the kinds of thing that can be wrong. But there is no evidence that chimps can show any awareness of these kinds of state in conspecifics.

If this is right, it suggests that chimps have no concept of error. And if that is right, it would add further to the explanation of why chimps cannot pass the 'false belief test' for theory of mind. The test is well-known: children are told a story (illustrated by dolls or by human experimenters) in which character A in the story puts (say) a marble in a box, in view of the other character B. Character B leaves the room and character A removes the marble and hides it somewhere else. When B returns, the child is asked, 'where does B think the marble is?' The uncontroversial result is that above a certain age (about four) children give the 'right' answer: *in the box*. But younger children often answer that B thinks the marble is where A hid it. In short, they have no understanding that B is in error, or has a false belief.

The claim that apes have any chance at all of passing the false belief test is very controversial; and there seems to be lots of evidence that they cannot (see Call and Tomasello 2008). Nonetheless, according to the mentalist point of view I have been assuming, chimps do seem to have some other kind of representations of the mental states of other chimps. So chimps have a 'theory of mind' in the sense of having representations of the mental states of others; and we can call these representations 'beliefs' if we like. But this theory of mind is restricted to a conception of (something like) relational or factive mental states like knowledge or

seeing. By contrast, unlike the chimp's conception, the child's maturing conception of mind introduces a conception of error. A conception of error is something which (as I argued in section 2) is what language facilitates. Perhaps it is not a coincidence, then, that the child's conception of error fully emerges at the age of four, which is roughly the age of linguistic competence.

In any case, we should not expect sharp distinctions in when these capacities emerge, nor in what fully constitutes linguistic capacity or a particular kind of theory of mind (in this sense, the 'matter of degree' talk is quite right). But the tentative conclusion I do want to propose here is that insofar as it is correct to talk of the chimp's theory of mind, the evidence suggests that this theory does not contain a conception of false belief or error. So if the argument of section 2 was correct, that the pursuit of knowledge for its own sake requires a conception of error, we should conclude that chimps (at least) do not pursue knowledge for its own sake.

The third and final area I would like to examine is learning and imitation. If there is such a thing as the capacity to pursue knowledge for its own sake, then it cannot be a miracle. From a naturalistic point of view, if humans have the capacity to pursue knowledge for its own sake, this must be grounded in, or arise out of, capacities which are simpler and perhaps innate. What might these capacities be? How did they come about, both in the life of an organism, and in the development of the species?

When looked at in the light of these questions, the study of imitation in animals and human infants suggests some interesting answers. A particularly interesting case is provided by well-known work by Victoria Horner and Andrew Whiten (2005). In one of their experiments, the demonstrator showed chimps and

infants how to open a ‘puzzle box’ with a tool in order to get the reward hidden inside. Both chimp and infant successfully copied the task. In the next stage, the demonstrator performed an action which was irrelevant to the opening of the box. The chimps who had learned to open the box ignored this action and proceeded to open the box in the way they had originally learned. The infants, on the other hand, copied the demonstrator by imitating the causally irrelevant action before successfully opening the box.

This striking result was reported in the popular press in the UK as showing that chimps are more intelligent than humans. While one can appreciate why they said this – the children blindly copy the demonstrator’s action, while the chimp goes straight for the reward and does not mess around with the irrelevant action. As Premack puts it, ‘the child imitates to imitate, whereas the ape imitates to obtain food’ (Premack2010: 25). But there is another way of looking at the result, from the point of view of this paper’s theme. The ability to imitate without knowing what the imitation is for provides the human infants with a stock of abilities which go beyond the mere obtaining of an immediate goal or reward. Might this be related to the ability of mature humans to pursue information for its own sake?

Commenting on their result, Whiten *et al* speculate about the explanation of their result:

> a plausible explanation . . . is simply that we are such a thorough-going cultural species that it pays children, as a kind of default strategy, to copy willy-nilly much of the behavioral repertoire they see enacted before them. Children have the longest childhoods of any primate, much of which is spent in play, practice

> and exploration, so there is plenty of opportunity to weed out wrongly assimilated aspects of the actions observed. (Whiten et al 2005: 280)

The fact that humans have long childhoods is obviously an important factor in making possible the kind of activity that Horner and Whiten discovered. But there is another way of seeing their result. Rather than the explanation being that we are such a thorough-going cultural species, it might be that the capacity to imitate things which have no immediate point or purpose is part of what makes us a cultural species in the first place. I don't mean to put forward a hypothesis about which came first – imitation or culture as such – but rather to suggest that *some* central features of human culture (for example, our interest in knowledge for its own sake) would not have been possible were it not for the development of the human infant's capacity for 'over-imitation'.

Some support for this explanation comes from the work of the developmental psychologists György Gergely and Gergely Csibra (see e.g. Cisbra and Gergely 2009). Gergely and Csibra have proposed a novel theory of learning in human infants, which they call 'Natural Pedagogy'. Their extensive experimental work on pre-linguistic infants suggests that infants have an ability to learn very quickly what they call 'generic' and 'cognitively opaque' information. Information is 'generic', obviously enough, when it can be put to more than one use. And information is 'cognitively opaque' when the infants have no idea what the function or purpose of what is being communicated is. They learn to do certain things by imitation even when what they are learning has no obvious point. Gergely and Csibra claim that infants have an innate capacity to recognize an occasion as one in which an adult is

trying to communicate something to them: infants are naturally sensitive to certain situations as communication situations, and pick up on certain cues as cues for communication (such as tone of voice). They hypothesise that infants have an innate adapative capacity to recognize such situations and call this capacity 'Natural Pedagogy'.

The Natural Pedagogy hypothesis has a couple of intriguing connections with the speculative thesis I am defending in this paper. For one thing, nothing like Natural Pedagogy has been discovered or hypothesized in apes, and it is famously difficult to train apes to learn generic information. And this provides a link to the idea of the search for knowledge for its own sake. The infants' ability to recognize the communicative situation is very flexible across different contexts, and the information they learn is often 'cognitively opaque': that is, it is not tied to any particular practical activity or motivation.

However, what matters here is not whether the Natural Pedagogy hypothesis is true, but rather the relation between the data they have discovered and the theme of this paper. The data is one thing, their theory another. If Gergely and Csibra are right that infants learn this kind of information, it fits in well with the lesson I drew from Horner and Whiten's puzzle box: that children over-imitate, that they copy things even if those things have no obvious point in the task they are trying to complete. Learning things without learning the point of them might be the ontogenetic psychological basis for the interest in knowledge for its own sake.

In this section, I have looked at three sources of evidence for a distinction between human and animal cognition, with respect to the presence of the pursuit of knowledge for its own sake: evidence from communication, from social cognition and

'theory of mind' studies, and from studies of learning and imitation. I have tried to draw attention to a pattern: in all these areas, animal thought is geared to practical, immediate consequences. Of course, a much more detailed survey of the evidence is needed in order to go anyway to establishing this conclusion. But the pattern I have detected is, I hope, suggestive and significant.

4. Conclusion

I have argued that, in a sense, Aristotle was right: we do naturally desire to know, and that we sometimes desire to know things for their own sake. We pursue what we might call 'intellectual epistemic goals', independently of their practical consequences. In itself, this claim might be obvious enough. The controversy comes in the claim that this might be distinctively human, and in how the evidence is supposed to support the claim. I have argued that both philosophical considerations (for example about what the concept of belief requires) and empirical evidence (from animals and humans) support the thesis that the pursuit of knowledge for its own sake might be one of the things that distinguishes us from other animals.

I claim that the evidence suggests that non-human animals never pursue purely intellectual epistemic goals: their investigations of the environment are always for the sake of satisfying some other immediate goal: for food, shelter, sex, play or to engage other animals in collaborative pursuit of some of these goals. If pursuing a purely intellectual epistemic goal requires that one have the concept of error, as I have

argued, then the absence of a concept of error is part of the explanation of why this is so.[1]

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[1] Some of the ideas in this paper were first presented in an inaugural lecture in Cambridge in 2010, at the Darwin and Human Nature Conference in Cambridge in 2012, at the University of York, the Collegium Budapest, and at the Metaphysics of Evolutionary Naturalism Conference in Beirut in 2011. Thanks to the participants on those occasions for their generous contributions in discussion. I am especially grateful to Dan Dennett for a number of illuminating discussions.

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