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What does it mean to be human?

(Commentary to Jill Byrnit: Primate theory of mind: A state-of-the-art review)

We share 98% of our genetic make-up with chimpanzees, one of our closer primate relatives; yet, we express a unique phenotype. Aside from a larger brain, the control of erect posture, dexterous hands, or complex groups of facial muscles by which we express complex emotions, humans evolved unique ways to act and to solve problems. More importantly, as a species, we evolved unmatched ways to relate and deal with one another.

My aim here is to posit that the new level(s) of theory of mind evolved by modern humans could be simply the by-product(s) of particular ways of sharing resources. I propose that to account for human's bifurcation in primate evolution some 6 million years ago, it is useful to consider that what might have triggered this bifurcation was neither inside nor outside the organism, but a complex interplay of both.

This claim might sound trivial, but it is not. Accounts of human speciation revolve too often around the triggering emergence of a structure or a capacity that is essentially *internal* to the organism. But this "internalist" view is, in my opinion, flawed.

The perennial question of what makes us special in the animal kingdom keeps haunting biological and social sciences as well as Western philosophy from its inception.

Answers range from brain size and bi-pedal locomotion, greater social complexity, prolonged postnatal dependence (e.g., Bruner, 1972), unique enculturation of the human young (e.g., Tomasello, 1999), the command of symbolic language (e.g., Deacon, 1997), or as it is now hotly debated in comparative and developmental psychology: human special abilities to read the mind of others (e.g., Whiten & Byrne, 1988).

These answers all have in common the fact that they are partial (non exhaustive), post-hoc (retrospective), and arguably difficult to validate as causal accounts. They all tend to fall into circularity, that for example we might have evolved a larger brain size to deal with greater social complexities, or inversely that we might have evolved greater social complexities because we have a larger brain.

As stimulating and worthy of discussion these tentative accounts of human evolution might be, they are difficult to verify on an experimental basis. Furthermore, and this is my main argument here, all accounts of human evolution are flawed until they take a radical social and triadic stance, away from an "internalist" or individualistic view. Of course, this argument holds also for the evolution of particular abilities in mind reading (i.e., the generation of so-called "theories of mind") carefully discussed in Byrnit's article (2006, this issue).

The humanity question

To ask what might have caused human speciation is to ask what it means to be human as opposed to non-human. In other words, the question is: what constitutes our humanity? The search for answers is typically oriented toward special characteristics of humans as individuals or as a collection of discrete entities. We look for distinct brain characteristics that all humans have in common, which might be associated with singular mental or communicative capacities such as the capacity for meta-representation, language, self-conceptualization, syntactic and symbolic functioning, and more to the point here, the capacity to theorize about what is happening in the mind of others. But the flaw here is to ascribe special mental powers to humans as *individuals*, each carrying the product of 6 million years of evolution since speciation. In fact, these mental powers are socially defined and socially determined. They are in essence "triadic", not constitutive of the individual per se.

What it *means* to be human is not in our brain or in any of the particular capacities we might have improved or added to those of our ancestors in the course of human speciation. The bottom-line of what it means to be human is the unique way we share resources to survive collectively. Brain size and mental capacities for language, self-conceptualization, meta-representation, memory, or high levels of mind reading are just by-products of these unique ways of sharing. Therefore, to capture what it means to be human, I would suggest that one must focus not on what is *inside* the individual but rather on the way human individuals transact and share resources among themselves and how these resources are collectively represented in comparison to other primate species.

If, as suggested by Jill Byrnit (2006) in her review of the current research on *Primate Theory of Mind*, we evolved special abilities to speculate about the mental states of others, the question is why and how does it make human experience putatively unique in comparison to the experience of our close relatives?

Here are some suggestions based on three simple, yet crucial, predicates: (1) Human unique capabilities, whatever these might be, are inseparable from a niche (the *human niche*) for which they are adapted and have been selected for in a process of co-evolution. (2) The social context and social dependence are of the essence in human evolution, as they are in the evolution of any other social animals. (3) If social animals of various species can adapt to the same physical

environment, what differs is the way they share among themselves the same resources.

Next, I present and discuss briefly each of these predicates in turn. Note that in trying to capture what the human experience might be in comparison to non-humans my idea is that we need to investigate how each species share resources, not what capacities the particular individual member of a species might or might not show or possess (whether larger computing ability or higher grade theory of mind). Here, I advocate for a more social and contextual approach to the origins of human evolution in the tradition of ethology. In relation to theory of mind, the question is not whether humans as a species brought mind reading to new levels. The question is *why*, and my tentative answer is "by co-existential necessity".

The Human Niche

Species share the same physical environment and often the same basic resources such as air, water, or trees. Yet, the same physical feature of the environment rarely has the same survival meaning across species. A tree is, for chimpanzees, a place to spend the night, to hide, or to feed. For humans, a tree is a source of energy, a material for the confectioning of multiple artifacts, and an object of aesthetic appreciation. The same feature in the environment affords different things and therefore has different meanings, meanings that are species specific. Note that these meanings are not defined by the constitution of the individual per se. Rather, they are defined by the functional relation between the individual member of a species and the environment surrounding it, including all other members and living entities (e.g., con-specifics, preys, or predators, in addition to physical things). This functional relation is constitutive of what is commonly referred to by ethologists as an animal's *niche*. Each species has its own unique niche that defines species-specific meanings of an environment that might be physically the same but is psychologically profoundly different.

In all species, individuals do not merely adapt to an independent physical environment; they actually always contribute to its creation by transforming it. Hunting and gathering species transform the environment by scavenging for food, constantly traveling in the quest for new, more abundant resources for calories. They graze, they pick, they kill, and when they exhaust the resources, they move on elsewhere.

What is unquestionably unique to humans is, for better or for worse, our unique impact on the environment, which we transform, process, alter, in addition to destroy. The mere sight from a plane when flying over land in most regions of the world is a crying testimony of the uniquely human phenomenon. No other species has had such an impact on the environment, particularly in the past couple hundred years with the advance of the industrial and now virtual revolution, a period that is minute at the scale of biological, primate, and even human evolution (a proportion of 0.00003 of the period since human speciation).

But what might account for the unique ratchet effect in human evolution when looking at our impact on the environment and the explosion of the human niche in recent years? Evidently, it is impossible to reduce the phenomenon to biological or mechanical causes. It is doubtful that spontaneous genetic mutations or change in brain structure or brain size underlie humans' accelerated and out of control impact on the environment that occurred in recent evolution. The causes are cultural and come primarily from the reverberating effect of *co-evolution* whereby invention and transformation of the environment are constantly re-defining the human niche in a cumulative and exponential fashion. In addition to the transformation of the physical environment, this niche is defined by the exponentially changing ways we communicate, collaborate, move about, get entertained, create and produce new tools, tools that build tools. The environment humans create and transform for themselves defines the human niche to which they adapt.

To be human is primarily to adapt to this niche that is unlike the niche of any other animal. It is an always faster developing environment that constrains rapid adaptation via the testimony and instruction of others. It thus entails a reliance on trust and reciprocity among individuals. It is also an environment that emphasizes prestige and *reputation*. (To be human is indeed to care about reputation). The levels of theory of mind that might be unique to humans are by-products of these basic survival constraints within the human accelerated co-evolutionary niche.

Human social dependence

In comparison to other primates, humans are born too soon, another unique feature and constitutive element of the human niche. The human evolution of bipedal locomotion is associated with an anatomical change in the configuration of the pelvis bone that narrows the birth canal. This transformation, conjugated with larger brains (i.e. greater cranial growth) contributed to the accelerated human birth (Trevathan, 1987; Rochat, 2001). Although the relative duration of human gestation (40 weeks) is comparable to the gestation of close primate relatives (i.e., gorillas, chimpanzees and orangutans which ranges between 34 and 39 weeks), the rate of human pre- and postnatal growth is markedly reduced or slower. The overall growing period of humans spans about 20 years. By comparison, it is cut in half in chimpanzees (Gould, 1977). These basic facts are at the origins of fundamentally different developmental contexts for the young of human compared to the offspring of other species. They are also associated with fundamentally different parenting techniques.

The prolonged immaturity of the human child who is, by survival necessity, born too soon entails particular cares from the mother and surrounding adults. It also entails a starting state of great social dependence over a period of time that is unmatched among other primates. This starting state of social dependence spans close to one quarter of an individual's life and sometimes even more depending on the culture (I am

thinking of cultures where mothers continue to be major care providers way beyond childhood).

In general, human parenting stands out by its degree of reciprocal empathy. Across cultures adults are compelled to engage in playful reciprocal exchanges with their progenies from at least 2 months of age. Affective mirroring is a human trademark, the main feature of early face-to-face interaction between infants and caretakers (see, Gergely & Watson, 1999; Rochat, 2001). This trademark is also the emotional pillar of the human niche, children from birth constrained to adapt to such reciprocity in order to receive the care they need to survive. It is unique to humans and forms the context in which particular capacities for mind reading develop.

Aside from particular care, human prolonged immaturity and the great social dependence of humans create a unique opportunity for exploration and learning by observation. Human infants and children spend months, if not years, observing, exploring, and playing while being intensely monitored and taken care of by others. This unique opportunity is another pillar of the human niche across cultures, regardless of the variety of its expression. Some cultures provide multiple playful artifacts (toys) to nurture and support children's spontaneous exploration of the world via play and imitation. Other cultures provide very few toys but ample opportunities for learning via the observation of others (Lancy, 1996; Odden & Rochat, 2004).

In all, this forms a core context for human development that is unique to the species. It is also unquestionably a major source of the enculturation of the human child who, in such context, appears to develop advanced mind reading abilities required for their adaptation. But this is only indirect evidence and, as mentioned by Byrmit (2006), the process of human enculturation remains largely underspecified, calling for much more empirical research.

Homo Negotiatus

All social animals have to share resources, but humans have evolved unique ways of sharing based on reciprocity, agreement, contracts, or handshakes. As pointed out by early anthropologists, small traditional human societies from all over the world are primarily organized around complex systems of gift giving and receiving, reciprocal exchanges and bartering (Mauss, 1952/1967; Malinowski, 1932). Humans evolved these unique traits of reciprocation *in addition* to the sharing by coercion that prevails in other primate species. Thus, a central aspect of what it means to be human is the propensity and ability to negotiate the value of things in the context of reciprocal exchanges.

Human children, unlike other primate young, grow to become *Homo Negotiatus*, as part of a species whose social life is organized around the active construction of the consensual value of things.

To adapt and be active participants of this unique organization, individuals have to develop unique capacities, including high levels of mind reading. Mutual exchanges and reciprocity in the sharing of resources entail the co-

construction of consensual values about things. This co-construction among individuals requires the ability to combine first and third person perspectives at very sophisticated levels. These levels, presumably uniquely attained by humans, entail more than the construal of others' intentions and desires, but also the construal of belief and value systems held by others. This, in turn, entails a strong conceptual sense of self *in relation* to others, including a sense of property or ownership that is uniquely developed in humans (Rochat, 2006, in preparation).

The gift giving and receiving systems that are a common denominator among the great variety of human cultures are unique to our species. These systems rest on the sense of property as social power evolved by humans, in particular the power property gives individuals to relinquish it or give away property to build affiliation with the group.

Property is indeed human power, for better and for ill. It is also the context in which unique capacities for reading the mind of others evolved as a by-product of the human ways of sharing resources. Sharing and reciprocity are cornerstones of the human niche, hence of the human psyche. They are fundamental and need to be taken into consideration when theorizing about human and non-human capacities from a comparative and evolutionary perspective.

Conclusions:

I started by stating that too often the question of what makes humans different from their close relatives is construed from an internalist perspective, identifying particular features that are constitutive of the individual. I proposed that this internalist view is flawed, bound to provide only a poor account of what it means to be human.

When considering the exponential "ratchet" effect of co-evolution that is characteristic of human evolution, particularly in the past two centuries, the unique social dependence and child care of humans, together with the unique propensity of humans to organize socially around complex systems of negotiated values and reciprocation, it appears obvious that the adaptation to such a niche requires children to develop particular abilities to read the mind of others. They are highly scaffolded to do so by unique emotional mirroring, the sharing of experience, instruction from others, and the opportunity to learn by observation. All these human propensities constitute the human niche, the product of a bifurcation that occurred some 6 millions years ago in primate evolution.

What evolved in the human lineage, is a particular niche that is found, not in the head of the individual, but rather in the ways human individuals relate and share resources to assure their survival. Sophisticated mind reading abilities evolved as a by-product of these ways and in turn, these abilities contributed to the changing of the human niche as part of the exponential process of human biological and cultural co-evolution.

To conclude, if comparative research in primate social cognition is a worthwhile enterprise that provides crucial

information on our origins, the species specific niche for which each trait has evolved and is fit for should not be overlooked. Ultimately, what evolved in human evolution is the human niche, not the individual, be it, reduced to a brain, a posture, or higher mind reading capabilities.

Individuals are adapting to their niche in order to survive. Brain, posture or mind reading capabilities are just

by-products of this adaptation. Humans, however, unlike any other primates, keep transforming their niche in exponential, creative, and also highly consequential ways as seen today in global warming or the impact of the internet. This is the cardinal and highly consequential feature of what it means to be human.

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