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Too early birth

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

Jill Byrnit's reading and discussion of primate theory of mind is very comprehensive and rich in detail. The paper is interesting and thought-provoking in many ways, among other things in the comparison of the ontogenetic development of the human child. I have chosen two delimited subjects which as far as I can judge are relevant in the discussion. (1) The question of the birth of the human child - is it delivered too early? There are many theories which choose that opinion - theories of paedomorphoses and neoteni among others. (2) The question regarding the reality of innate neuropsychological modules as developing in favourable environment.

Too early birth

In comparison between the human and other anthropoid apes, it is familiar to underline the nearly identical DNA-structure and with this argue that we are very close to our cousins. However, the argument can be turned around: the great amount of differences between humans and other apes are *not* reducible to the genome. The detailed description of the human genome and the well-known reduction in the number of active genes to 30,000 are the overlap in DNA which are not drawn attention to in the same extent as before.

A striking difference between humans and anthropoid apes is of course our social organization which in just a few thousand years has changed the whole ecosystem at the planet in such a way that it is necessary to calculate with a total destruction of all life. However, those traits, which we are interested in in this context, are developed in the first few years, and as such we are primarily not concerned with the variations at societal level.

In matters like these, it is surprising that the discussion of too early birth is so rare. If it is mentioned occasionally it is regarded as a curiosity most of the time. However, the morphological differences between humans and anthropoid apes are relatively striking, and it should be possible to draw some relatively solid consequences.

There are a number of morphological differences of a certain interest, regarding the growth and maturing of the foetus and in the immediate prolongation of the embryonic condition. It is beyond doubt that the human child is born too early. One factor which certainly plays a major role is the relatively large volume of the human brain. The female pelvis would not be large enough if the brain should mature to a level as high as the anthropoid apes. If the human foetus should

grow as long as the anthropoids then the brain would have to have grown to a volume, which was impossible to pass through the floor of the pelvis. The female pelvis is not big enough to give birth to a foetus which is at the same developmental stage as the anthropoids when they are born.

One of the most convincing aspects is the growth of the human brain compared to the growth of anthropoid brains. The growth of the mammalian brain has a common trait: it accelerates in the embryonic stage - and decreases right after the birth. The growth accelerates in the foetus stage but the acceleration rate declines when the foetus is born. The growth curve breaks just after birth. The growth is still accelerating but not as fast as before the birth. However, there is one mammal, and only one, which deviates from this broken curve and that is the human being. Humans are the only living species where the growth curve does not break but continues with the same speed as inside the female. The specific growth rate of the human brain continues 12 months after birth. If we were to be born as developed as other anthropoids, measured by the weight of the brain in relation to bodyweight and the full grown brain weight, then the female pregnancy would last 21 months. At birth macaques' brains have 65% of the lasting average weight, chimpanzees' brains have 41% of the lasting average weight, and the human brain has only 23% of the lasting weight at birth.

The development of the nervous system in humans and the anthropoids is the most important in this context, however, there are also other important characteristics. Newborn chimpanzees and gorillas have a bone structure which are very similar to the mature members of the species, especially regarding limbs, motor function, and body posture. Contrary to this, the human bone structure has to develop - e.g. the S-shape of the vertebral column has to be constituted. It functions as a sort of shock absorber, and without it, we would live in a permanent concussion (Walker and Shipman 1996). In general, human beings have from birth all the morphological traits but they had to learn how to use them. Humans have to learn to stand, seat, and walk. In comparison to other mammals, our functionings are in a striking way much more immature. We use 30% of our lifetime to develop those bodily skills and traits (perceptual, motor functions etc.) which hereafter remain relatively permanent.

These factual statements can be interpreted in different ways. One of the proposed interpretations maintain that the human beings in a way never transcend an infantile level, called paedomorphoses and neoteni. We are locked in this infantile level because we are born in a version which is not able to develop. Another possibility is that we develop a

mature version but that we simply use a very long part of our lifetime to reach this level. Other interpretations maintain that the fact that we are born too early as a matter of fact has a little strange consequence: if we had a much longer pregnancy and we were not born too early then we would look much more like the other anthropoid. That would say that we in a more general perspective would develop backwards. (see Gould 1977 and Verhulst 2003).

The point is that when humans in this way are born too early then the maturity process, which among other animals happen before birth, must take place outside the womb, and therefore be more sensitive to changes in society, especially changes in the social determination of the socialisation. Human development takes place in a social womb which is more open to historical conditioned variations. The point is that development outside the womb does not necessarily reflect a continued development inside the womb - the two sorts of development do not necessarily have the same developmental logic.

Potentiality and modules

It is possible and necessary to problematize the Darwinian standard version of evolution by selection. According to JB human behaviour is a product of evolutionary selection. This assumption seems to be problematic in certain ways, especially if selection is interpreted in accordance with the classical view: those traits and other characteristics are selected which increase the individual's prospect for survival.

(a) Inside biology the unit of selection has been discussed in nearly a century - ever since the development of population biology, starting around 1920. What exactly is the unit of selection - is it the individual organism or individual, or is it the species as such. The so-called group selection implies that certain traits have selection value, not because they give the individual organism a better chance of survival, rather on the contrary, but because they are useful for the species. Another possibility is that the selection unit is the individual gene and that those traits are selected which increase the chance of survival of the gene. Unless you are a sociobiologist - and that is at present a rather small community - you have to admit that there is something transcending the biological selections sphere, and that is society. In relation to societal organisation, the concept "survival" is rather limited.

(b) In JB's discussion of the module theory, it is said that the modules one way or the other can be potentially present in "great apes" and that they are triggered by certain societal or cultural events.

"The modules are normally only activated in humans although they can be potentiated in great ape individuals given certain, as yet unspecified, socio-cultural conditions." (p. 38).

Even if both dormant genes and jumping genes exit, some would say that it is problematic to operate with a potential existence of neuropsychological modules of some complexity.

First, it is a matter of fact that it is impossible that neuropsychological modules of a certain complexity could be genetically determined (the structure of the brain is far too complex to be produced directly by genes. Second, it is hard to believe that a whole module can exit potentially. If the argument goes that the module always is present, but is only manifested if they are triggered by some specific societal or cultural conditions (which presuppose that the ape is socialized) - then this scenario is impossible within a developmental theory based on selection. Where and who should these potential modules have shown their selection value? If the modules only come to manifestation in those very few examples of apes socialized in a human family, then potentiality is a pseudo concept. The modules would never have shown their value and would then never be selected in the first place.

(c) In connection with the discussion of the social and cultural it is mentioned that it is not possible to presuppose a trait which is developed by some conditions outside the organism, if these outer conditions themselves only could be developed if these traits already were present.

This is clearly an example of the hen-and-the-egg discussion. On the other hand, the hen-and-egg discussion is a pseudo problem because it is not a problem inside a Darwinian context, where the first hen was made from an egg which was laid by a non-hen. Maybe the point is that the development of these complex entities (the psyche, the societal) could not be regarded as a serial row, where first the biological, then the psychological, and last the societal. The development of the specific human psyche is not possible to separate from the development of the societal - the psyche is generated simultaneously and in exchange with the generation of the societal. Maybe it is not exactly two sides of the same coin, but two entities which are unbreakable. Neither it is appropriate or consistent to think evolution of the human psyche or society as jumping - evolution works gradually.

Cultural apes had theory of mind

One of the central problems in the discussions are why apes if they grow up in close contact with humans nevertheless develop some aspects of a theory of mind - and in any circumstances some aspects which they do not have if they grow up "in nature". There could be several reasons for this:

(a) One of the limiting factors in the discussion is that someone from the start insists that it is the same attribute which may develop in identical ways into different species. But why should it be identical modules? We are talking about to species which are separated for million of years - so rather it would be remarkable if the same traits were developed in the same way. Is it not so that the "sleeping modules" presuppose that it is exactly the same traits developed in exactly the same way? Why is it not so that you can reach the same target at two very different ways?

(b) The English anthropologist Terrence Deacon has a very convincing argumentation (Deacon 1997) regarding the development of the human brain. He shows that is very likely

that the brain is developed as it is because of the use of language. Language, culture, and society not just influence the biological development but are a primary factor in the development of the brain. It is not possible to transfer those developed traits to other species in the grown up process so those skills which the apes develop in relation to humans must be of another sort and are not directly comparable to human skills.

References

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