

Is the Evolutionary Ladder a Stairway to Heaven?

Review by Casey Luskin

Developmental Dynamics in Humans and Other Primates: Discovering Evolutionary Principles through Comparative Morphology

By Jos Verhulst

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413 pp.

Developmental Dynamics in Humans and Other Primates by Jos Verhulst¹ is a nonmaterialist account of the “evolution” of human development. By the late 1970’s, influential evolutionists such as Stephen Jay Gould and Niles Eldredge foresaw that evolutionary biology would come to rely increasingly upon changes in developmental genes over mutations in structural genes:

We do not see how point mutations in structural genes can lead, even by gradual accumulations, to new morphological designs. Regulatory changes in the timing of complex ontogenetic programs seem far more promising—and potentially rapid, in conformity with our punctuational predilections. The near identity of humans and chimps for structural genes, and the evidence of major regulatory change evidenced by human neoteny provides an important confirmation.²

Heterochrony (changes in timing during development) is frequently cited by such Darwinists who want to ground evolutionary theory in embryological evidence. From what I hear, however, there is much more to the developmental differences among higher organisms than mere differential timing. Heterochrony may be necessary for macroevolution, but it is far from sufficient to explain differences among organisms. Gould and Eldredge operated under an unyielding materialist framework which assumed any such changes were the result of unplanned, random mutations. Yet Verhulst sees evolution as guided by a non-material force which permits changes in timing during development to drive animals towards a pinnacle archetype form.

I should admit that while reading the first pages, I was skeptical. Perhaps during my years taking evolutionary biology courses at UCSD I became fully indoctrinated with the dogma that teleology and orthogenesis hold no place in a scientist’s mind. After all, we all were taught that evolution scales no ladder of progress, but merely works “without a plan or a purpose.”³ Under a non-materialist view, reductionist assumptions can be questioned, and Verhulst uncovers many coincidences of human development that challenge materialism.

Verhulst’s underlying observations are that primates are the least specialized mammals, and humans are the least specialized primate. If one assumes our ancestors were ape-like hominids, human development is delayed relative to our supposed relatives. Thus, some infantile characteristics of apes appear to be retained in adult humans. These delays are what Gould and Eldredge (quoted above) called *neoteny*. Because of human neoteny, Verhulst states that our delayed development causes us to have longer lifespans, because our growth and development is prolonged as it is delayed. Furthermore, prolongation of development increases with time, so

¹ *Developmental Dynamics in Humans and Other Primates: Discovering Evolutionary Principles through Comparative Morphology* by Jos Verhulst (Adonis Press, 2003).

² Gould, S. J., & Eldredge, N., “Punctuated equilibria: the tempo and mode of evolution reconsidered,” *Paleobiology* 6(1) (1977), pgs. 115-151 (internal citations omitted).

³ Miller, K. R., & Levine, J., *Biology* (Prentice Hall 4th edition, 1998), pg. 658.

that organs which begin growing later in development may become disproportionately larger than parts which grow earlier. This is termed *hypermorphosis*.

To see how these themes play out, the broad patterns of human development are *cephalocaudal*, meaning parts closer to the top tend to develop earlier. Because our development is the most delayed among primates, hypermorphosis accounts for why humans have the longest legs. Additionally, since limbs grow in a *distoproximal* pattern (i.e. the ends start developing first), neotenized humans have hands and feet with the smallest relative skeletal weight among primates. The upshot is that humans are the most fetalized species among primates. Coincidentally, we are also the only species capable of investigating our own development. Verhulst thinks there is a connection.

Under Verhulst's model, specialization inhibits expression of the pinnacle form. Our neoteny prevents humans from becoming specialized, such that the pinnacle archetype is afforded a greater opportunity to emerge during human development. For example, our more developed legs are what permit upright posture, but this was made possible because of neoteny (combined with hypermorphosis). Fetalization is also responsible for our larger cranium and our lack of specialization is responsible for our highly mobile thumb. In the end, our tendencies towards non-specialization and fetalization may be what permit our abilities to think, write, and talk. Verhulst would argue there is an evolutionary tendency towards these higher intellectual capacities. The book provides a host of further examples of conspicuously human traits which result from neoteny and/or hypermorphosis, ranging from human skeletal structure, to hair-growth patterns, to our internal organs and biochemistry.

At many points, Verhulst is critical of the Darwinian paradigm. He consistently argues that many neotenized aspects of human development would lack any selective advantage, and finds their widespread existence challenging to Darwinism. Additionally, Verhulst believes many developmental patterns "harmoniously" interact to permit human cognitive abilities through simple adjustments towards fetalization. Darwinian preadaptation is too an unlikely explanation, so Verhulst believes some "intrinsic principle"—not natural selection—must be guiding evolution towards the intelligent human form.

Verhulst also takes aim at traditional Darwinian examples of *atavisms*, or supposed mutant throwbacks bearing an ancestral trait. For example, some Darwinists have cited the rare human "tail" as a throwback to the tail of our simian ancestors. Yet, Verhulst notes that the human "pseudotail" is not a true animal tail because it never contains bone. Humans with pseudotails have a completely normal vertebral column, and the "tail" is often located in an awkward position on the back (they can be high or off-center). The pseudotail develops out of the caudal appendage, a small, transitory growth at the end of the vertebral column which appears temporarily in primate fetuses. Importantly, primates with true tails *also* form this caudal appendage during development—at the end of their true tails! Only one primate—the Barbary ape—has a pseudotail which normally persists into adulthood. The pseudotail is not a throwback, but it is easily explained as a normal fetal trait which is simply never lost in a highly neotenized mutant.

A reviewer of Verhulst's book in *Quarterly Review of Biology* wished Verhulst would ask more difficult questions.⁴ I agree—although many primate characteristics fit with Verhulst's hypothesis, are there traits that don't fit? Humans could be the archetypal mammal but under Verhulst's own admission, many other species have neotened characteristics. We are special because we are the only species that can investigate our own development. But if a Barbary ape had an I.Q. of 180, why wouldn't it claim that the retention of its fetal pseudotail indicates that it has realized non-specialized, fetalized gestalt of primate evolution? Other similar examples could be given. Is the book justified in taking its eminently anthropocentric approach?

Additionally, the question must be asked if *Homo sapiens* truly is wholly unspecialized? Verhulst admits that the human chin, unique among primates, is not present in juvenile stages and presumably it is a specialized feature. Additionally, humans have obviously unique cognitive, cultural, and language abilities whose resemblances are found in no other species. Neoteny may give us a higher cranial vault, and hypermorphosis may allow our "late-blooming" forebrain to grow larger. But I'm fairly sure these forces alone did not give us the genes that organize "the most complex and orderly arrangement of matter in the universe"⁵ that just happens to fill our large cranial vault. Verhulst may convincingly show that retardation and unspecialization during development permit our unique cognitive abilities. (Page 348 boasts an extensive chart summarizing the numerous lines of developmental evidence supporting his thesis.) But the implication is that unspecialization leads to highly specialized abilities. Can this paradox be explained or is it just an unexpected artifact of his "intrinsic factor?"

Finally, assuming there is some evolutionary tendency towards the human form, why has only one species on earth realized that form? Perhaps I just need to go back and rewatch *Planet of the Apes* (1968) for the answer.⁶ (While we're on the topic of sci-fi, Verhulst's thesis could work nicely for Trekkies trying to explain why intelligent alien species are usually "humanoid.") Could Verhulst's model permit future evolution, causing further neotenzation, and further loss of our "animal" characteristics? Verhulst suggests that our species may one day reveal an "angel-like race of human beings" that has been "completely liberated" from animal characteristics.

Verhulst's thesis is surely unconventional, and in the case of the angels, unscientific. The fact that Verhulst has published a paper titled "World Cup Soccer players tend to be born with the sun and moon in adjacent zodiacal signs"⁷ soured the flavor of his ideas as I tried to swallow them. Nonetheless, Verhulst at least talks as if he has his categories straight. In dealing with a subject with profound metaphysical implications, human origins, Verhulst explains the difference between a scientific and a metaphysical approach:

The natural sciences are in no position to investigate any immaterial reality that may exist. They can, however, research the material effects of immaterial factors.

⁴ See review of *Developmental Dynamics in Humans and Other Primates: Discovering Evolutionary Principles through Comparative Morphology* in *Quarterly Review of Biology*, 79 (2004), pg. 73, by John G. Fleagle.

⁵ Asimov, I., "In the game of energy and thermodynamics you can't even break even," *Smithsonian Institute Journal*, August (1970), pg. 10.

⁶ In the original *Planet of the Apes* movie, astronauts land on Earth about 2000 years in the future, only to learn that humans have been supplanted by apes as the intelligent species on the planet. According to the movie, given enough time, other species will also develop a humanlike intelligence.

⁷ Verhulst, J., "World Cup Soccer players tend to be born with the sun and moon in adjacent zodiacal signs," *British Journal of Sports Medicine* 34 (December, 2000), pgs. 465-466.

Scientists in this situation are like explorers who discover the tracks of an unknown animal in the snow. They can rationally conclude that since the snow itself did not produce the tracks, some animal must have done so.

Similarly, ID proponents claim ID can study an object to determine if it was designed even if the theory cannot elucidate the specific identity of the designing agent. As Michael Behe writes, ID considers the identity of the designer *hypothesis non fingo*.⁸ In the end, however, Verhulst admits that he is appealing, perhaps unscientifically, to an Aristotelian *final cause*.

But Verhulst appears to be no ID proponent, and his approach may itself be largely metaphysical. Verhulst's humanizing force is not a mind acting with will and intentionality, but functions like a vague cosmic pressure upon biological evolution. Given that Verhulst's causal entity is an unspecified "intrinsic factor" or "guiding principle," one wonders how he knows that. Design proponents understand the informational properties created by intelligent agents based upon observations of the nature of humanly designed objects. This provides a template for inferring design in natural objects. But we don't have such empirical experience with metaphysical "guiding principles." Unfortunately it seems that Verhulst occasionally tries to say a bit more about the "animal" than is empirically warranted.

Lurking in *Developmental Dynamics* could be a starting point for detecting design in human developmental processes. One of Verhulst's most interesting observations is that increased neoteny causes a complex interaction of developmental processes which permit increased cognitive abilities. This raises the question of the extent to which our complex developmental patterns must be specified in order to create a species capable of high cognitive, cultural, and communicational abilities. Verhulst has collated an impressive amount of data, so *Developmental Dynamics* is a must-read for those interested in "ID-Devo." If such a study is undertaken, Verhulst reminds that a distaste for materialist explanations should not color our findings. For Verhulst, "[r]everence for the truth takes precedence above all else." Perhaps the most reverent explanation for the patterns Verhulst has observed should presently be "we don't know."

⁸ Behe, M., "The Modern Intelligent Design Hypothesis," *Philosophia Christi* 2(3) (2001), pgs. 165-179. "*Hypothesis non fingo*" means "to feign no hypothesis," and can be taken as saying "I do not try to make any hypothesis about that matter."