**Humans are NOT fundamentally different from other animals.**

**To clarify the grounds for this debate:**

**Macmillan Dictionary defines fundamentally as “used for emphasizing the basic nature of something”.**

**Differences in basic nature are contextualized in evolutionary literature as a difference in degree. And, fundamental differences do not exist when an intermediate is possible. If transitional properties are the only distinguishing factor between species, they are fundamentally similar. As Dr. Jerome Adler said:**

*Adler, Mortimer Jerome. “The Modes of Difference: The Possible Answers”. Lavergne, TN: Publisher Not Identified, 2014. Retrieved from http://www.thegreatideas.org/dmd02.html*

When two things differ in kind, no intermediate is possible; *the law of excluded middle applies;* *and the two things can be said to differ discretely or discontinuously. Thus, for example, an animal either is able to fly or not; there is no intermediate between flying and not flying.* **When two things differ in degree, intermediates are always possible;** *the law of excluded middle does not apply; and the two things can be said to differ continuously. Thus,* **for example, between any two species of reptile differing in length, a third species, having an intermediate length, is always possible. The fact that no** *fossil or* **extant species may have this intermediate length does not remove the possibility of there being one.** *Another way of saying this is* *to say that* **the law of excluded middle holds** *for things that differ in kind and* **only for things that differ in kind.** *Thus, for example,* **a whole number is either odd or even. There is no third possibility. The possibility of an intermediate***--in fact, of an indefinite number of intermediates-*-**between any two objects that differ in degree confers** *upon things that differ in this way the trait of* **continuity.** *Two things that differ in degree differ continuously, not discretely. Here the law of excluded middle does not apply. We cannot say of light intensities that they must be either white or black, or this shade of gray or that.**The light intensity may be neither white nor black, but gray. It may be neither this nor that shade of gray, but a shade intermediate between them.*

**Thus, in order to prove a fundamental difference, the affirmative burden is to prove that there is a difference of kind, not degree. If other animals possess a characteristic of a different degree, that is not sufficient to prove the difference is fundamental.**

**The only negative burden is to prove that humans are not entirely distinct in their nature from other animals, through means of being intermediate forms that originated from other animals.**

**OBSERVATION 1: TRAIT ACQUIRANCE**

**First, all capabilities possessed by humans are acquired traits from prior forms, meaning underlying characteristics are fundamentally similar. The potential for intermediate types through transgenics, or the process of introducing an outside gene into an organism to exhibit a new property, proves that these differences are only of degree. As Jeff McMahan explains:**

*McMahan, Jeff. "Animals." A Companion to Applied Ethics. 2012. Web. Retrieved from* [*http://jeffersonmcmahan.com/wp-content/uploads/2012/11/Animals1.pdf*](http://jeffersonmcmahan.com/wp-content/uploads/2012/11/Animals1.pdf)

 *“To appreciate that the genotype per se is morally irrelevant, consider a range of cases made possible by technologies for combining genes from different species.* **Scientists have already created “transgenic” pigs by inserting a single human gene into the nucleus of a** *porcine* **zygote.** *(Their aim is to create pigs with livers that could be transplanted into human beings without provoking a lethal immune response.)* **Just as it is possible to produce a pig in which each cell carries a single human gene, so it is possible to produce a chimpanzee with a single human gene –** *or two human genes, or three,* **or more.****Imagine a spectrum** *of possibilities.* **At one end of the spectrum is a chimpanzee with one human gene.** *Next there is a transgenic chimpanzee with two human genes. And so on, with each individual further on in the spectrum having one less chimpanzee gene but one more human gene than the previous one. Since the overlap between the human and the chimpanzee genomes is high, it may be well beyond the middle range of the imagined spectrum before there are individuals that are part-human, part-chimpanzee, with bizarre blends of human and chimpanzee characteristics.* **At the far end of the spectrum is an individual grown from a chimpanzee zygote** *from* **which all the chimpanzee genes but one were** *removed and* **replaced by corresponding human genes. The point of this spectrum is** *not just that the species membership of individuals beyond the middle range may be genuinely indeterminate;* **it is** *also that it would be* **implausible to suppose that the** *moral* **status of any individual in the spectrum is determined by** *how many, or* **what proportion***,* **of** *its* **genes [it has].** *were human, or taken from a human being.“*

**The development of language is one example that highlights the fundamental similarities of both humans and animals, which can be further applied to all “unique” human traits. Thomas Schoenemann writes:**

*Schoenemann, P. Thomas. “Conceptual complexity and the brain: Understanding language origins”. In Language Acquisition, Change and Emergence: Essays in Evolutionary Linguistics edited by William S.- Y. Wang and James W. Minett. Hong Kong: City University of Hong Kong Press. 2005,pp. 47-94. Retrieved from http://www.indiana.edu/~brainevo/publications/ACE-Schoenemann-ch3.pdf*

*In order to properly conceptualize the evolution of language,* **it is necessary to keep clearly in mind the two endpoints** *(Figure 1).* **In the beginning there existed a population of hominids lacking language, while at the end there exists a population with language. In order for this change to have occurred, it must necessarily have been true that there was some adaptive benefit of some kind to linguistic behavior** *(broadly defined)***.** *It does not matter for the present argument whether this benefit was related to communication or to some aspect of cognition or thinking, but some benefit must have accrued to individuals with better language abilities, or else we would not now be using language. Furthermore,* **this would have to have been true within each intermediate population***, on average***.** *Given this, it follows that if an individual within any one of these populations were able to use some pre-existing cognitive abilities to better accomplish some linguistically relevant processing, this individual would gain immediate advantages by doing so. Behavioral adaptations that require minimal genetic changes will be favored at each step.* **Given that this was always the case, the whole evolutionary process would necessarily have been biased towards incremental changes in pre-existing mechanisms, and decidedly not towards the evolution of completely new, language-specific cognitive [ability]** *modules***.**

**Fundamental similarities can also be explained by using historical evidence, as modern ancestors showed the ability to exceed at a variety of tasks that are “unique” to humans. These intermediate forms represent the continuous connection between humans and animals. Francesco D’Errico writes:**

*D’ Errico, Francesco, and Chris B. Stringer. “Evolution, Revolution or Saltation Scenario for the Emergence of Modern Cultures?” Philosophical Transactions of the Royal Society B: Biological Sciences 366.1567 (2011): 1060–1069. PMC. Web. 28 July 2017.*

*Our review of* **the evidence contradicts the idea that the emergence of crucial technological innovations and symbolic material culture was the result of a sudden change in human cognition** *occurring in Europe or Africa approximately 40–50 ka, or just in Africa approximately 60–80 ka.* **Possible differences** *in subsistence strategies and technology* **between anatomically modern and late archaic humans***, as well as their variations in time and space,* **do not prove** *the case for an* **inherent [differences].** *incapacity of the latter to reach the degree of fitness that we observe in their penecontemporaneous modern counterparts. Although comparisons between cultural adaptations in very different and changing environmental settings are obviously difficult to draw, it is clear that* **in some instances** *European* **Neanderthals developed** *knapping* **techniques and tool types that were more ‘advanced’ than those of** *some African Middle* **Stone Age groups***, that the opposite also occurred, and that in other situations, such as in the Levant, technology was virtually identical. Instances of symbolically mediated behaviours comparable to those observed in historically known human populations are recorded by at least 100 ka, probably before, in Africa, by approximately 120–100 ka in the Middle East and probably by at least 60 ka in Europe.* **This contradicts the assumption that the crucial innovations that have made us as we are** *can only have* **come from***, or have been assimilated from an* **anatomically modern humanity.**

**OBSERVATION 2: COGNITIVE FUNCTION**

**Second, the traits regarded as fundamentally human are actually extensions of non-fundamental traits, and thus fundamental similarities. Specifically, the brain is seen as the sole cognitive feature that defines unique human life. However, the fundamentals of animal brains are the same across the animal kingdom, which includes humans. Mark Mattson writes:**

*Mattson, Mark P. “Superior Pattern Processing Is the Essence of the Evolved Human Brain.” Frontiers in Neuroscience 8 (2014): 265. PMC. Web. 24 July 2017. Retrieved from* [*https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4141622/*](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4141622/)

*“While bigger in size, when viewed under the microscope* **the human brain is remarkably similar to those of non-human primates** *and lower mammals***.** *At the cellular and molecular levels, there is little to distinguish our brain from those of species that preceded us in evolutionary history. The major cell types (neurons, astrocytes, oligodendrocytes, and microglia) are similar in their morphological features, molecular phenotypes and functions. Neurotransmitters are identical with glutamate and GABA being the major excitatory and inhibitory transmitters, and monoamines and acetylcholine being prominent secondary transmitters in all mammals. Similarly, gasotransmitters (nitric oxide, carbon monoxide, and hydrogen sulfide), neuropeptides and neurotrophic factors (e.g., neurotrophins, fibroblast growth factors, and insulin-like growth factors) are conserved (Amaral and Campbell, 1986; Jones, 1986; Barde, 1994; Mustafa et al., 2009). In addition,* **a range of behaviors including learning and memory***, anxiety, aggression and others* **are modified in the same ways by** *the same drugs in* **humans and lower mammals.** *Moreover, genes that encode proteins involved in brain development, function and/or disease are largely conserved; indeed, genetic mutations that cause psychiatric or neurodegenerative disorders in humans often induce similar neurochemical, cellular and behavioral phenotypes in transgenic animals (McGonigle, 2013). Thus, findings from neuroscience research has confirmed the general conclusion of Charles Darwin who proposed in The Descent of Man that the minds of humans and related species are fundamentally similar (Darwin, 1871).” “***The term intelligence** *has been defined in different ways by psychologists and neuroscientists, but a general definition proposed by one group of eminent scholars* **is “A very general mental capability that***, among other things,* **involves the ability to reason, plan, solve problems,** *think abstractly, comprehend complex ideas, learn quickly,* **and learn from experience.”** *(Gottfredson, 1997).* **All mammals are able to learn and to make decisions and choices based upon their prior learning experiences, a fundamental aspect of reasoning.** *Mice and rats have about 1 billion neurons in their nervous system whereas humans have 100-fold more neurons with approximately 30 billion being in the brain. Neuroanatomical and neurochemical considerations described in this section suggest that* **the superior intellectual capabilities of humans are solely** *or largely* **the result of the increase in the number of neurons and synapses** that mediate *enhanced* encoding, integration and *inter-individual* transfer of patterns**.** *As referenced above,* **there is little or no uniqueness in the structural or functional properties** *of the neuronal circuits* **that mediate intelligence** *in humans (Figure ​(Figure2).2)***. Moreover,** *the* **intellectual capability** *of any individual* **requires the** *integrated function of* **pattern-processing networks distributed throughout the cerebral cortex** *(Duncan, 2010),* **indicating that there is no single brain structure responsible for the mental superiority of humans.”**

**And, while culture is largely considered the fundamental human difference our brain has allowed us to create, it is merely an extension of a fundamentally similar process. Neuroscience proves that culture is nothing more than a larger number of neural connections. The role of culture in human lives is fundamentally no different than any other biological function. Charles Lumsden writes:**

*Lumsden, Charles J., and Edward O. Wilson. “Genes, Mind, and Culture: The Coevolutionary Process.” Cambridge, Mass.: Harvard University Press, 1981. Cambridge, Mass.: Harvard University Press, 1983.*

**[The] mind is driven by a selectional,** *rather than an instructional,* **mechanism.** *This procedure, which can be called a schema activating system, is still genetically fixed but permits a flexibility of response to the environment***. The brain develops a large but finite number of neural assemblies that have the capacity to develop into cognitive schemata. When such a system operates in the gene***-culture mode,* **a particular culturgen** *or class of culturgens* **triggers the maturation of one of the assemblies into its predestined schema** *by means of cell growth and differentiation, synapse formation and modification, or the establishment of fields of electrogenic activity***. All living things take in information and** *in turn* **respond based on the operating system they have. Humans have more inputs and a higher amount of neurons to make sense of those inputs compared to other animals, but the structure and function of the two systems are at their core the same.**