The speed of human evolution

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Intro

The rate of evolution is a subject that has been highly contested in the scientific community as well as in the general public. Broadly defined, the rate of evolution is the speed at which a species changes over time. This rate can vary highly between species, making it difficult to determine whether the rate of evolution is fast or slow for any one species. Due to this, there is a large debate on the speed at which humans are evolving. Some people, like proponents of the paleo diet (Zuk, 2013, 4) or evolutionary psychology (Richardson, 77), believe that evolution in humans is relatively slow and we don’t change that much over time. Others argue that the rate of evolution in humans is relatively fast and that we are still evolving today. To understand which of these hypotheses is correct, it is helpful to look at instances in which the rate of change of organisms has been both rapid and slow.

Background

In general, the rate of evolution varies depending on the organism, the environment that it is in, and the timeframe that we are observing. Oftentimes the rate of evolution is extremely slow, and little change occurs in a species over time. For instance, the horseshoe crab has experienced little to no evolutionary change over time (Gould, 1989, 43). It is regarded by many as being a “ living fossil,” meaning that it shows little difference between itself and its ancestors. Species like this one show that evolution can occur extremely slowly if there is no environmental change. Since the horseshoe crab is already adapted to its environment, there is no need for it

to evolve any further. While some species have historically evolved slowly, other species have been recorded as evolving extremely fast.

In instances where a species is experiencing dramatic environmental change, that species tends to evolve quickly to better handle its environment. Peter and Rosemary Grant conducted a study on Galapagos finches that “ documented rapid evolutionary change in these birds from one generation to the next in response to weather-induced environmental changes, the study of real-time evolutionary change in nature has become a cottage industry, with hundreds, or perhaps now thousands, of well-documented examples” (Losos, 26). This study shows that species have the potential to evolve faster depending on environmental influences. Another famous study by John Endler documented how guppies would react to being moved to a stream that didn’t have any predators in it. He found that a lack of predators caused the guppies to develop significantly brighter colors in only 14 generations, which is much faster than many would believe a visual change could occur. (Lososl, 27). This study shows that drastic environmental changes can cause equivalent changes in the rate of evolution.

Argument Reconstruction

While there is reason to argue for both a fast and slow rate of evolutionary change in humans, the arguments for a slow rate seem to be noticeably weaker than for a fast rate. Often, when people are assessing the rate of evolution in humans, they tend to assume that we are in some way unique because of the “ pace of modern life” (Zuk, 2013, 4). This reasoning can be

seen by proponents of the paleo diet as well as proponents of evolutionary psychology. Both of these groups assume that the rate of evolution in humans is fixed and relatively slow; they believe that humans haven’t been evolving fast enough to compensate for their rapid societal advancements.

The paleo diet claims that people should eat only what our neolithic ancestors ate because our bodies haven’t evolved to eat the processed foods that we have today. This argument is interesting because it has become a popular fad in society, developing a cult-like following. The paleo-diet has become so popular that products promoting this diet can be seen in almost every grocery store. They claim to be healthier than alternative products because they are made only of ingredients that humans have evolved to digest, and the general public seems to believe this claim. The underlying assumption behind this argument is that humans are evolving relatively slow and that our digestive systems aren’t capable of processing the complicated foods that have arisen in society. Similarly, evolutionary psychology, which is the theory that human mental processes can be explained through evolution, assumes that humans have evolved so little recently that we can make conclusions about our current behavior based off of how humans were believed to have acted thousands of years ago. This argument makes the assumption that environmental changes have not had a relevant impact on the evolutionary patterns of humans. If environmental changes had been significant enough to spur a rapid increase in human evolution, then they would not be able to formulate any conclusions based off of historical behavior.

If I were to reconstruct this argument, I would claim that the rate of human evolution would be very slow if environmental and external influences permitted it to be so. From the background of this paper, we can conclude that the rate of evolution depends on the rate of environmental change. Therefore, for someone to logically argue that humans are evolving at a slow pace, they would have to conclude that humanity's environment hasn't changed that much over time. This claim would require specific examples and empirical evidence in order to be reliable.

Argument Evaluation

The argument that humans have been evolving slowly is inherently flawed because it fails to account for the severity of environmental change that humans have undergone. If we assume that environmental change causes a fast evolutionary rate— which seems highly probable when looking at the historical examples— then we can conclude that the environmental changes that humans have undergone would constitute a relatively fast evolutionary rate. For proponents of a paleo diet or evolutionary psychology to argue that the rate of evolutionary change in humans is slow, they would have to provide staggering evidence that our environment has not changed. This task seems extraordinarily difficult, especially when you consider the rapid rate of climate change as well as the staggering influence that technological advances have had on our lives. Their lack of empirical evidence tends to be the biggest down-fall of their arguments (Richardson, 77).

But, neglecting the influence of environmental factors isn't the only flaw in the argument for a slow rate of evolution. There is a major disconnect

between looking at how humans have evolved and how they are currently evolving. At best, looking at how humans have historically evolved can give you an estimate as to how they can evolve in the future. It can't, however, be used as a blanket statement for how they will evolve in the future. The high dependence of evolutionary rate on external factors means that it is highly subjective to change overtime. This is especially true today because of the high rate of environmental change. Historically speaking, almost all species that experience environmental change have a high rate of evolutionary change. Therefore, it is illogical to conclude that humans would be different than any other species in this regard. Humans may be significantly different than other species, but it seems unlikely that we would be one of the only species that would fail to evolve faster as our environment changes.

The assumption that humans can only evolve so fast makes logical sense, and it's easy to see why proponents of paleo diets and evolutionary psychology arrived at this conclusion. Marlene Zuk effectively summed this up when she said, " We often think about evolution over the great sweep of time, in terms of minuscule changes over millions of years when we went from fin to scaly paw to opposable-thumbed hand, it is easy to assume that evolution always requires eons" (Zuk, 2013, 3). At a surface level, this assumption seems logically sound. However, I don't think that it is an accurate statement to say that the evolution of humans will always be slow. Evolution can be a volatile process, especially when factoring in rapid environmental change. Therefore, it's logically plausible to say that humans

evolved slowly in the past but are currently evolving at a fast pace due to recent environmental changes.

While it might seem harmless to assume the humans evolve slowly, it can actually lead to a lot of irrational behavior. The most common examples of this irrational behavior stem from the paleo diet and evolutionary psychology. The paleo diet causes people to drastically change what they eat based on the false premise that they have only evolved to eat certain foods. There is some good that can come out of this belief. In many ways, the paleo diet is much healthier than common diets are today. Despite this, the paleo diet rests on a false premise that our evolutionary rate is too slow to cause significant change. Similarly, evolutionary psychology also causes people to act irrationally. Evolutionary psychology sets up the assumption that a person can somehow “ optimize” their behavior by replicating behaviors of humans thousands of years ago. This belief can lead to a lot of strange actions and beliefs by those who adhere to evolutionary psychology. In both cases, the assumption that humans are evolving slowly causes humans to act in suboptimal and illogical ways.

Countenance Possible Responses

Proponents of the paleo diet often make the claim that humans are unique compared to other species. This egocentric assumption is a dangerous one to make because there is no reason to assume that evolution would act any differently on humans other than the fact that we think of ourselves as being special in someway. Humans are, for all intents and purposes, essentially the same as any other species in regards to evolutionary patterns. Additionally,

the paleo diet often makes the assumption that the digestive system, specifically, doesn’t evolve fast enough. This argument would make sense if humans had a highly specialized diet. It would be difficult for us to rapidly adjust to dietary changes if we hadn’t experienced much dietary diversity in the past. However, This argument doesn’t seem to hold up to scrutiny, because humans have historically been able to adapt to different diets. An example of this would be humans evolving to produce lactase, the enzyme used to digest lactose, in order to digest milk into adulthood (Zuk, 2013, 1). Additionally, technological advances allow humans to more readily change their diets. We have developed to cook and process our food in ways that are easier to digest, so it seems unlikely that we would have any major inability to digest foods.

Proponents of evolutionary psychology often make the argument that behavior evolves differently than physical traits do. They might agree that humans are evolving, but they assume that psychological traits are different than physical traits in this regard. This argument seems inherently flawed because psychological traits are rooted to physical areas of the brain, which would suggest that they evolve in the same fashion that other physical traits do. There doesn’t appear to be any reason that would separate psychological evolution from physical evolution. This puts the burden of proof on proponents of evolutionary psychology; in order for their argument to be true, they would need extraordinary evidence showing that psychological evolution is different than physical evolution.

Overall Merit of Argument

Overall, the argument that humans aren’t evolving at a significant rate seems to have very little empirical data to support it. Both the paleo diet and evolutionary psychology make the assumption that you can look at how humans have evolved to determine how they will evolve. This reasoning seems extremely flawed, and would need comprehensive evidence to support it. Furthermore, the main arguments that supporters of these theories usually rebut with have key flaws in their reasoning that lowers their credibility. Overall, there seems to be vast amounts of evidence that would support the argument that humans are evolving quickly and very little evidence that would speak to the contrary.

Outstanding Questions/Emerging Issues

If I were to write another paper, I would want to focus on whether humans are evolving at a constant rate or whether the rate is subject to change over time. This question would be interesting to answer because it could help to further explain why the paleo diet and evolutionary psychology are flawed. If humans’ evolutionary rate cycled between periods of little evolutionary change and periods of rapid evolutionary change, then the average rate of evolution would still suggest that humans are evolving fast enough to significantly change over time, even if there was documentation of a period with little to no change. This could also raise the question of whether or not humans are currently in a period of rapid evolution or a period of little evolution. The answer to this question could potentially alter how we perceive human evolution.

Conclusion

In this paper, I made the argument that humans are evolving at a fast rate. Species that are experiencing rapid environmental change have historically had a fast rate of evolution, and there is little reason to assume that this pattern would be any different in humans. Proponents of a paleo diet or evolutionary psychology might argue that the rate at which humans are evolving is too slow to significantly impact us. However, these arguments undervalue the importance of environmental change. While these arguments initially make some sense, they lack empirical evidence to support their claims and have some illogical inconsistencies in their arguments. The overall validity of their claims appears to be minimal, suggesting that the rate of evolution in humans is significantly faster than they believe.

Bibliography

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