

<http://www.sciencealert.com/here-s-the-theory-that-humans-are-still-evolving>
Still Evolving

Can't stop, won't stop.

DAVID NIELD

13 JUL 2016

The scientific world has accepted the idea of human evolution, the survival of the fittest, and the process of natural selection. But what no one can agree on is whether we're still evolving as a species or not.

One Harvard economist thinks that we are – though more slowly than in the past – and his findings offer an interesting look at how our bodies are continuing to change.

Harvard University's Jonathan Beauchamp looked at data concerning 20,000 people from just one generation in the US. Specifically, he analysed lifetime reproductive success (rLRS) – the passing on of genes from parents to children, and then their children in turn.

All those in the study were born between 1931 and 1953, and had passed child-rearing age by the time the study was conducted. Beauchamp weighed up the number of children each person had, as well as recording other traits linked to genetics, including body mass index (BMI), schizophrenia, menstruation age, and education level.

There were two main findings of note: those with more education had a lower rLRS – which means they had fewer children on average – and there was a slight uptick in the age at which menstruation started (although other evidence says that this is actually going down).

"My results provide additional evidence that humans are still evolving – albeit slowly, especially compared with the rapid changes that have occurred over the past few generations, due to cultural and environmental factors," writes Beauchamp in his paper.

In other words, it could be that humans are generally evolving to become less educated, seeing as fewer educated people are passing on their genes.

There are limitations to the research, as Beauchamp admits. It's a small sample size for this kind of study, covering just one generation, and it doesn't take into account those who may have had children before dying early. What's more, even if evolution is occurring slowly, other factors may be correcting for it, he says.

That said, it's another piece of useful evidence in an increasingly complex puzzle. Is nature perhaps slowly reducing the gene pool of those who spend longer in education?

In any case, you'd be hard-pressed to find a consensus elsewhere on the idea that humans are still evolving.

On the one hand, as contemporary humans we've become advanced enough to control our environment to a large degree: meaning problems like disease, a lack of shelter, or a lack of food – which have always killed off the 'weakest' in the human gene pool – aren't as influential as they were in the past.

On the other hand, modern lifestyle is changing at a faster rate than ever, and there's evidence that human beings are changing with it – becoming more distracted with the rise of the internet and mobile phones, and so on.

Many scientists, including Beauchamp, make a further distinction between cultural evolution – meaning, for example, more of us are spending more time sat at a desk, rather than out in the fields – and biological evolution (which would entail significant changes to our body and brain).

The fact that genetic mutation, genetic drift (the movement of gene variants in a population), and gene flow (the migration of genes between populations) can also trigger evolutionary changes, as well as natural selection, further complicates the issue.

By some definitions, evolution doesn't ever really stop until a species becomes extinct – so it really depends on what you accept evolution to mean in the first place.

It's a point famed naturalist Sir David Attenborough has addressed in the past.

"I think that we've stopped evolving," he told Radio Times in 2013. "Because if natural selection, as proposed by Darwin, is the main mechanism of evolution – there may be other things, but it does look as though that's the case – then we've stopped natural selection."

But Attenborough conceded that, in other kinds of 'evolutionary' contexts, humans were still making significant advances.

"[O]ur evolutionary process is now cultural... Humans have a great cultural inheritance as well as a physical, genetic inheritance – we can inherit a knowledge of computers or television, electronics, aeroplanes, and so on," he added. "Each generation has got all these books that tell them these things, so our cultural evolution is proceeding with extraordinary swiftness."

The study is published in PNAS.

<https://www.scientificamerican.com/article/are-human-beings-still-ev/>

Scientific American article, author not identified

Are human beings still evolving? It would seem that evolution is impossible now that the ability to reproduce is essentially universally available. Are we nevertheless changing as a species?

The answer is still largely speculative, of course, but it goes to the heart of several interesting controversies about the distinctions between microevolution (changes within and between breeding populations over time) and macroevolution (the rise and fall of identifiable species). Is the questioner interested in whether changes will take place in *Homo sapiens* or whether new *Homo* species will appear? For example, geographic isolation is one of the traditional mechanisms invoked for triggering the rise of new species; some experts therefore flatly say that human evolution has ended because in the modern world, no one is really isolated from the rest of humanity. And depending on how it might be applied, culture and technology could either isolate some people from others, or it could help to renormalize them to the rest.

Meredith F. Small, associate professor in the anthropology department at Cornell University, offers one perspective:

"First of all, humans haven't really changed the rules of natural selection. We might think that because we have culture--and with it all kinds of medical interventions and technologies--that we are immune from natural selection, but nature proceeds as usual. Evolution is defined as a change in gene frequencies over time, which means that over generations, there will be changes in the gene pool,

and humans experience those changes as much as any other organism. Some people live and some people die, and some people pass on more genes than others. Therefore, there is a change in the human gene pool over time.

"But we might suggest that with all that cultural and technological intervention that there would be some kind of influence in the composition of the gene pool, and there is. Take smallpox, for an example. Years ago millions of people died from smallpox, and their genes were not passed on because many of them died before reproductive age. The human gene pool was then missing the genes of those people. But now, since smallpox has been wiped off the planet, people who normally died of the disease now live, probably have children, and thus contribute to the human gene pool. In another example, the birth rate always goes down the more developed, and economically affluent, countries become. Today the highest birth rates are in Latin America, Africa and Asia. People in these places are now the major contributors to the human gene pool. In many generations, the human species will be more composed of genes from those groups than from developed countries.

"And so culture, development and medicine might change the tenor of the human gene pool, but they do not take away the force of evolution, the force of change. Also, keep in mind that culture may not seem a 'natural' force, but because it is part of our environment, it is just as natural as disease, weather or food resources. We in developed nations may think we are immune from natural selection because we are so surrounded by material goods and high technology, but this immunity is an illusion. Technology protects us from nothing, and medicine surely hasn't cured all the diseases--just ask the people in Nebraska near the Red River what they think!

"We in developed nations are more comfortable, but we still die, and we still contribute differentially to future generations. And most important, we have to realize that the developed-nation view of the human species is a very narrow take on humanity. The majority of the human population does not live like this; more than half the people on the earth have never spoken on a telephone.

Human Evolution Assignment

- 1) Write a 2 paragraph response to the following prompt. The paragraph should be about 5 - 6 sentences. You should also include at least 1 quote from the article. Be sure to cite it correctly.
 - a. Prompt: Do you think that humans are still evolving if so in what ways, if not why do you think this?
 - i. Be sure to include information on environmental factors.
 - ii. Be sure include a prediction of what you think the future of the human population will be.
- 2) In a 2 -3 sentence's, what do you think of the last paragraph of the Scientific American article

Human Evolution Assignment

- 1) Write a 2 paragraph response to the following prompt. The paragraph should be about 5 - 6 sentences. You should also include at least 1 quote from the article. Be sure to cite it correctly.
 - a. Prompt: Do you think that humans are still evolving if so in what ways, if not why do you think this?
 - i. Be sure to include information on environmental factors.
 - ii. Be sure include a prediction of what you think the future of the human population will be.
- 2) In a 2 -3 sentence's, what do you think of the last paragraph of the Scientific American article

Human Evolution Assignment

- 1) Write a 2 paragraph response to the following prompt. The paragraph should be about 5 - 6 sentences. You should also include at least 1 quote from the article. Be sure to cite it correctly.
 - a. Prompt: Do you think that humans are still evolving if so in what ways, if not why do you think this?
 - i. Be sure to include information on environmental factors.
 - ii. Be sure include a prediction of what you think the future of the human population will be.
- 2) In a 2 -3 sentence's, what do you think of the last paragraph of the Scientific American article