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## Ask a Scientist: Where are humans from?

Abby Barnes, Ph.D. student in biological psychology Feb 13, 2018



Courtesy of The University of Tennessee, Knoxville.

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Question: “I have heard recently that the 'Out of Africa' theory of human evolution is under question. Can you explain what this is and why it is now being criticized?”

Most of us are so caught up in our modern lives that we don't care about what happened to people 200,000 years ago. However, to evolutionists and biological anthropologists, 200,000-year-old events are hot topics. Recently, an analysis of a skull found in China threw them into a frenzy. This skull may change how we understand the history of human evolution. In particular, the skull challenges the “Out of Africa” theory of human evolution.

But let's back up. What do we mean by human evolution? Well, a long time ago – over 6 million years ago, to be exact – there were some animals that walked on two legs. These animals are considered to be the last shared ancestor of the two-legged primates. Eventually, these animals evolved into the different primates we know today: Chimpanzees, gorillas and humans.

How, exactly, did human evolution occur? That is a topic that is furiously debated. Many people deny human evolution entirely. In their eyes, humans are so separated from other animals there is no way that humans evolved from other animals. To most scientists, however, human evolution is an undeniable fact.

The arguments then start to center around how *Homo sapiens*, the human species, emerged from other hominids. Our most recent ancestor is *Homo erectus*, which walked the earth around 200,000 years ago. The question is, how did *Homo erectus* become *Homo sapiens*?

In the 2000s, the scientific community appeared to come to a “consensus,” meaning they had discovered enough evidence to confidently answer the question. The answer was that *Homo sapiens* evolved in Africa and about 100,000 years ago migrated “Out of Africa” into other regions, ultimately replacing the other hominids that lived there. These other hominids included species like *Homo neanderthalensis*, or the Neanderthals. This is the “Out of Africa” theory.

So what about that Chinese skull? Actually, this 260,000-year-old *Homo erectus* skull was found in China over 40 years ago. But that was a long time ago, so what's all the fuss about now? Well, the researchers decided to run new analyses on it, and they concluded that the skull has far more in common than expected with *Homo sapiens* skulls — a conclusion which caused an uproar in the anthropological community.

The researchers determined this by investigating the two major factors that anthropologists use to study skulls: Skeletal facial features and the size and shape of the neurocranium, the part of the skull that surrounds the brain. These researchers found that the facial skeleton of the skull was similar to more recent *Homo sapiens* skulls. The neurocranium, however, was similar to the much older African and Eastern Eurasian skulls. Together, this gives the skull unique morphology that looks a lot like the oldest *Homo sapiens* specimens found in Africa. However, the skull is too old to be from the migration of *Homo sapiens* out of Africa. So how did it arrive in China?

These findings are surprising because they call into question the validity of the “Out of Africa” theory. The skull offers evidence to support a different theory: Different varieties of Homo sapiens evolved somewhat independently. However, these varieties probably experienced a lot of gene flow, which occurs when populations exchange genes through sexual reproduction.

Why is this important or interesting? Well, think of it this way. On one hand, you are the descendent of a single population of hominids that developed some extreme advantages, like increased intelligence, and somehow overcame all other hominids. On the other hand, you are the descendent of several populations that all developed advantages independently and then mingled in different ways and to different extents until the modern Homo sapiens was formed.

Probably, one of these options appeals to you more than the other. The idea that a single population developed so differently and in such an advanced way that it could conquer other populations is amazing. It makes the evolution of humans seem like a dramatic twist of fate, a stroke of luck that changed the world – which is obviously super cool.

However, the idea that all of the advantages humans have over other animals – our abilities to think, create, communicate, learn, remember and adapt – developed in different populations that eventually mingled and merged is also very cool. This would indicate that the selective pressures driving intelligent life are so strong that intelligence developed separately in different places. If this is true, it means that the evolution of intelligence is not dependent on an extremely lucky set of variables that can only be found in a few times and places.

Which leads us to the question, what does drive the development of intelligence? What are the factors that led our single — or multiple — evolutionary lineages toward our unique form of intelligence? Currently, we spend a lot of time looking towards artificial intelligence and alien intelligence, but do we even really understand our own intelligence? This understanding may be essential in the ability to recognize and develop intelligence elsewhere. It can only come from looking at our ancient ancestors.

Maybe we should all be a little more interested in what happened to humans 200,000 years ago.

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