

Perspectives and Resources from the Social Sciences

Sometimes, it's more difficult to understand the implications of evolution for people today because most of the evidence we talk about is for things that happened in the past. Contrary to popular conception, human evolution has not stopped. Remember, there is macroevolution and microevolution. Macroevolution is the change from one species into another. This is *not* what's going on with humans. Microevolution is the change in allele frequencies within populations. Human variation is increasing and the reason is simple.

The larger our population becomes and the better our medical and healthcare, the more possibility there is for new mutations to occur and to be survivable. Some of these new mutations provide a adaptive advantage. The most commonly cited recent (in geologic terms) example of human microevolution is the development of lactase persistence in some populations. The gene that codes for the production of an enzyme that breaks down lactose sugar in dairy products usually turns off after weaning. Thus, the “wild type” human experience of dairy is lactose intolerance, which some people experience as bloating, gas, intestinal discomfort, or diarrhea when they consume dairy products as adults. However, pastoral peoples in Africa and Europe with long histories raising cattle have been selected for a change in their genetic code, in which that regulatory mechanisms that in wild type turns off production of the enzyme that breaks down lactase sugar remains active. These people can enjoy milk, cheese, and ice cream throughout their lives.

It is clear that diseases like malaria, bubonic plague, smallpox, and probably HIV have or are exerting pressures on human genes related

to immune response. In fact, scientists recently discovered that another species from the *Homo* genus to which we belong lived in Asia at the same time as *Homo sapiens* ancestors and our closely related cousins the Neanderthals. This species, called *Denisovans*, we know only from a small bone fragment, but the entire Denisovan genome was sequenced from DNA extracted from that sample. The Denisovan genome is more dissimilar from either *Homo sapiens* or *Homo neanderthalensis* than even the latter two are from each other. However, we see some of the DNA that seems to have arisen in Denisovans in the genomes of South Asia and South Pacific populations today, which is likely related to some type of disease resistance in that region.

Furthermore, we can look to contemporary human behavior as vestiges or examples of evolution. The fields of evolutionary or Darwinian medicine, human behavioral ecology, and evolutionary psychology, in particular, are focused on how our contemporary behavior is the result of evolutionary processes. Evolutionary medicine focuses on the human anatomy and physiology and its theoretical environment of evolutionary adaptiveness, also known as the EEA. This idea suggests that the ancient environment we evolved in was different than the ones we live in today. For example, for approximately 190,000 of the 200,000 years that humans have existed in our present form, we lived in small hunter-gatherer bands and ate a variety of high-fiber fruits and vegetables, with little meat in our diet. We generally slept when it got dark and were less sedentary in our lifestyles. Many of the diseases we experience today—such as high blood pressure or obesity and diabetes—we associate with our “evolutionary mismatch” to our contemporary environment. This field and its applications are vast, but they represent very real and very practical applications of evolutionary theory to all of our daily lives.

Human behavioral ecology also considers cultural practices from the vantage of evolution, examining how ecological behaviors influence reproductive success in populations. In this regard, the evolutionary perspective does not focus exclusively on the reproduction of genes but also includes the capacity of cultural practices to enhance human success—or, to put it another way, at culture as an extremely variable human adaptation. In addition to passing on genes, inheritance also occurs through the cultural transmission of copying the behaviors of others. We can see evidence of this transformation in cultural complexity in the archaeological remains of Native Americans from southeastern North America, such as the Mississippians of Moundville.

Similarly, evolutionary psychology focuses on contemporary behaviors and suggests that our minds and social lives, in many ways, operate consistently with that mythical Paleolithic environment. For instance, evolutionary psychologists have largely disproved the notion that beauty is totally in the eye of the beholder. There is some cultural and psychological variation in attractiveness, but there is also a standard of beauty that is accepted cross-culturally and seems to be related to underlying health. Other behaviors are also related to our basically social nature as primates. For instance, our tendency to join with or form allegiances with various groups throughout our lives—our human politics—are very similar to those observed in, for instance chimpanzees. However, while we are all subject once in a while to going along with the crowd or getting ourselves worked up into a collective hysteria, only humans have elaborated group-level psychology to the level of religion or SEC football.