

Does evolution explain human nature?



Martin Nowak

In part.

I am deeply fascinated by evolution, and I wish to expand the boundaries of the evolutionary explanation as far as possible. Yet I do not think that all aspects of human nature can be explained by

evolution. The question is subtle, and the answer depends on how we choose to define “human nature.”

I like to think of human nature as a collection of thoughts, feelings, and actions that humans experience or perform. Language, for example, is a fundamental aspect of human nature. A child growing up in an environment of speakers develops a language faculty. The thoughts and ideas that are expressed in the languages of the world are all part of human nature. Similarly, we like to listen to music and perform it. A few of us compose music. Music is part of human nature. There is also something very intuitive about numbers and geometric objects, and the ability to do some basic math seems to be part of human nature.

Yet the great theorems of mathematics are statements of an eternal truth that comes from another world, a world that seems to be entirely independent of the particular trajectory that biological evolution has taken on earth. The great symphonies of Beethoven and Mahler capture glimpses of a beauty that is absolute and everlasting. Beyond the temporal, materialistic world there is an unchanging reality.

My position is very simple. Evolution has led to a human brain that can gain access to a Platonic world of forms and ideas. This world is eternal and not the product of evolution, but it does affect human nature deeply. Therefore evolution cannot possibly explain all aspects of human nature.

What is evolution? Evolution occurs whenever there is a population of reproducing individuals.

Reproduction at different rates leads to natural selection. Mistakes during reproduction lead to mutation. Mutation and natural selection are two fundamental “forces” of evolution.

Reproduction can be genetic or cultural. The former gives rise to genetic evolution, which has molded life on earth over the last four billion years. The latter is the most decisive factor shaping human society. Humans with language invented a mechanism for nearly unlimited cultural evolution. New ideas and behaviors can spread rapidly by learning, teaching, and imitation. Cultural evolution allows rapid innovation and is responsible for the dramatic changes that have occurred on this planet in the last few millennia.

Sadly, humans do not use their evolved traits only for good ends. They wage wars of destruction. They fight each other, and they destroy the environment that is essential for their survival. Despite all of this, a flame of love is burning inside us that cannot be extinguished.

I am fascinated by questions concerning the evolution of cooperation and altruistic behavior. Natural selection is based on competition between individuals. It introduces conflict. Cooperation means that one individual pays a cost for another individual to receive a benefit. Cooperation is opposed by natural selection unless specific mechanisms are in place.

For humans, the fundamental mechanisms encouraging cooperation are direct and indirect reciprocity. Direct reciprocity is based on repeated interactions between the same two individuals: my behavior toward you depends on what you have done to me. Indirect reciprocity is based on repeated interactions in a group: my behavior toward you also depends on what you have done to others. Cooperation among humans is related to altruistic behavior. Loving others and trying to help them are important aspects of human nature.

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Cooperation is, in my opinion, another fundamental “force” of evolution. Cooperation is needed for construction. Whenever evolution moves to higher levels of organization, cooperation is involved. The emergence of multi-cellular organisms, for example, requires cooperation among cells. And human language would not have evolved without sustained cooperation among potential speakers and hearers.

There is a fascinating additional problem concerning our present understanding of evolution. Evolution is a search process. Populations of reproducing individuals “search” for short-term solutions, such as adaptations to a new environment or modifications of a social system. But the search process has to operate within a given space of possibilities. This “search space” ultimately determines what can evolve. For example, evolution can find intelligent life, if it is part of the search space, but it cannot construct the possibility of intelligent life. For science to fully “explain” intelligent life (or other fundamental properties of living systems), we need not only a theory of evolutionary dynamics but also a theory describing how the fundamental laws of nature span the search space.

As a scientist, I could adopt the narrow position that I am exclusively interested in those aspects

of human nature that can be analyzed by scientific methods. This is a valuable and useful perspective, and it will continue to generate much scientific progress. But in my Faustian search for truth, I realize that science does not give a complete analysis of human existence. We are all confronted by questions concerning the mystery and purpose of life, which cannot be answered by natural science alone.

I subscribe to the ideas of what Leibniz called “perennial philosophy”: there is an unchanging reality beneath the world of change; this reality is also at the core of every human existence; and the purpose of life is to discover this reality. In the context of my own Christian faith, the fundamental aspect of human nature is our relationship with God and our participation in God’s love and eternity. This particular aspect of human nature is also not a product of evolution.

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