Abstract

The extensive, persistent ecological dominance of humans is unprecedented. We display a highly derived social adaptation involving uniquely extensive cooperation among nonclose kin. Further, humans possess adaptive capabilities, including language, high cognitive function, and technological virtuosity not previously seen on this planet. Moreover, this suite of properties emerged and was refined very rapidly on a geological time scale. These diversefeatures of humans present what is referred to as the "human uniqueness problem. "A theoretical interpretation ofthesephenomena is one of the largest remaining challenges to the scientific enterprise. While many interpretations have been proposed - several containing important individual insights - none has yet proven robust or complete.

A straightforward resolution of the human uniqueness problem is proposed. It is argued that coalitional enforcement is necessary and sufficient to allow extensive nonkin cooperation, leading to all major elements of human uniqueness. Coalitional enforcement arose uniquely in humans when the animals that founded the Homo clade acquired the ability to kill or injure conspecifics from a substantial distance. This resulted from the evolution of hominid virtuosity at accurate, high-momentum throwing and clubbing, previously supposed to be adaptations for hunting, predator defense or individual aggression. No previous animal could reliably kill or injure conspecifics remotely. This ability dramatically reduced the individual cost ofpunishing noncooperative behavior by allowing these costs to be distributed among multiple cooperators. The capacity for coalitional enforcement drove the evolution of a cooperative social adaptation stably and autocatalytically from the origin of incipient Homo about 2 million years ago through to the present moment-including socially supported, ultimately spectacular, refinements in weaponry and social monitoring, with attendant increases in efficiency of coalitional enforcement and thus in the extent of human cooperation. Its details rendered this evolutionary process very rapid.

This theory is believed to be robust and relatively complete. For example, coalitional enforcement is necessary and sufficient to allow for the evolution of language in an ape. Further, given the likely functional organization of the ancestral vertebrate mind, the coalitional enforcement hypothesis predicts, in addition to genetic information, the emergence of a second stream of design information in Homo, susceptible to Darwinian selection. A novel source of design information has long been suspected on empirical and intuitive grounds to be responsible for the uniquely high level of human adaptive sophistication. The unprecedented cognitive power of human minds is also predicted by these implications of the theory. Lastly, the "cognitive explosion" associated with the

relatively recent appearance of behaviorally modern humans is predicted by the theory, as is the increasing size of human political units.

The coalitional enforcement hypothesis and its immediate implications now enable the formerly elusive unification of diverse fields of study, including human biology, psychology, linguistics, paleontology, archaeology, anthropology, history, and economics.