

# Turning The Empirical Corner On Fi: The Probability Of Complex Intelligence

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The probability of receiving an intelligent extraterrestrial signal depends upon the uniqueness of a human level of intelligence. In 1996 I presented a paper at the 5th International Bioastronomy Conference in which I described the initial results from a long-term project aimed at an empirical assessment of the probability of a human-level of intelligence evolving in a nonhuman species. In that paper and subsequent publications, I provided evidence that the relative brain size achieved by human ancestors as recently as 2 million years ago was eclipsed by that of a contemporaneous mammalian group, the cetaceans (toothed whales, dolphins, and porpoises). The present paper extends these findings in several important ways. First, I will present a more rigorous statistical analysis of average relative brain size in humans and cetaceans that takes into account the variability in relative brain size in these two groups. Second, I will present data on relative brain size increases in humans and cetaceans controlling for phylogenetic relationships so that the independence, and thus probability, of instances of relative brain size increases can be better ascertained. Third, I will present data on the rate of relative brain size increases in humans and cetaceans. Fourth, I will describe future research aimed at correlating evolutionary changes in human and cetacean relative brain size with environmental, climatic, biological, and temporal agents. Through this approach, we may eventually obtain data on the kinds of physical and biological factors that are associated with, and possibly generate, evolutionary tracks to complex brains and intelligence.