

Fundamental Question and Answer of Human Evolution and Political States

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I. Introduction

The research question is as follows: Did the evolution of *Homo sapiens* directly cause the formation of political states? The null hypothesis is that the literature will show that *H. sapiens* coincidentally became the species that creates and operates the political states of the civilization of Earth, whereas the alternative hypothesis is that the literature will show that the reasoning behind political states is inherent in the instincts of the species. The research question will be answered by rejecting the null hypothesis and accepting the alternative hypothesis or vice versa. To do this, the analyst will use *Evolution of Cooperation* by Robert Axelrod as a source of information. He will also examine other historical and scientific documents that discuss the behaviors of Prehistoric clans of humans and how said behaviors, as well as the workings of the human brain, changed over the course of evolution.

The general consensus of the information uncovered, based on whether or not the brain of *H. sapiens* programs a strong tendency toward large social groups such as political states and their precursors in late Prehistory, will serve as the experimental test with which to choose between the null and alternative hypotheses, thereby answering the research question.

The research question matters because political states are commonly regarded as artificial, and there are some factions in the world that regard them as unjustified. While a negative answer to the research question through the null hypothesis would do nothing to change all that, an affirmative answer to the research question through the alternative hypothesis would indicate that political states are natural after all.

The rest of this report will provide an overview of the literature, a section

entitled Literary Review. The section entitled Theory, Argument, and Hypothesis will account for the initial assumptions, logic of cause and effect, definitions of important terms, relationships that will support either the null hypothesis or the alternative hypothesis, independent and dependent variables, and causal relationship or lack thereof between the variables. Research Design will explain the method of evaluating the conclusions and other important points in the literature and determine their relationships to the research question. The Results section will paraphrase some of the facts stated in the source documents, complete with in-text citations, and then analyze the relationship between the cited facts and the research question. The Conclusion will give a general summary of this report, state the direction of the evidence, and answer the research question. The section will then explain how this report expands or improves the knowledge of members of *H. sapiens* regarding the relationship between their species and the political states of which they are citizens. Finally, it will discuss how future research might further expand or improve human knowledge on this topic. The References will list all cited sources using the same format (since this report pertains partially to evolution) that the Lycoming College Biology Department has adopted for introductory courses in all cases and for other courses if no other format is specified.

II. Literature Review

The literature to be analyzed here consists of one book and six articles. The book, *The Evolution of Cooperation* by Robert Axelrod (to be subsequently cited in text as Axelrod 1984), discusses patterns of cooperation

and defection in terms of how well they do in computer simulations. Based on the simulations, this source also discusses how such patterns are likely to evolve in nature.

“A Behavioral Model of the Dual Motive Approach to Behavioral Economics and Social Exchange” by Gerald A. Cory, Jr. (to be subsequently cited in text as Cory 2006) relates the evolution in humans of brain physiology to that of neurology. The article relates a balance between psychological extremes of economic and social cooperation.

“Perspective-Taking from a Social Neuroscience Standpoint” by Malia F. Mason and C. Neil Macrae (to be subsequently cited in text as Mason and Macrae 2008) discusses when humans accurately read the perspectives of other humans and when they fail to do so. It also discusses the matter of when that ability arose in the Order Primates.

“The Evolution of Strong Reciprocity” by Samuel Bowles and Herbert Gintis (to be subsequently cited in text as Bowles and Gintis 1998) discusses how prehistoric clans of humans forced members to obey customs and norms. Such a practice is a likely precursor to written law, which is the basis of political states.

“Building New Political Actors: A Model for the Emergence of New Political Actors” by Robert Axelrod (to be subsequently cited as Axelrod 2001) discusses how political states can congeal from smaller units. Although this can explain many later examples of political states forming from smaller political states, it might also explain how the last prehistoric clans merged into the first political states.

“The Evolution of Ethnocentrism” by Ross A. Hammond and Robert Axelrod (to be subsequently cited as Hammond and Axelrod

2006) discusses cultural divisions. Such divisions help to explain why multiple political states exist on Earth.

“Evolution of Contingent Altruism when Cooperation Is Expensive” by Ross A. Hammond and Robert Axelrod (to be subsequently cited as Hammond and Axelrod 2005) explains how altruism came into being. Altruism is how humans can place the needs of others above their own.

Most readers probably do not have the time to read all these sources. This report makes the information far more accessible.

III. Theory, Argument, and Hypothesis

The main assumption for this report is that the source documents are reliable. This assumption is safe because they are primary and secondary articles, which means that they most likely have been peer-reviewed. While a book is technically different from an article, the only book among the source documents was written by Robert Axelrod, a professor who also took part in writing some of the articles.

The author of this report figured out cause and effect in two ways. The first way was to accept the cause and effect relationships stated directly in the source documents. The second way was to use basic logic. He used Ockham’s Razor to discard the notion of a coincidence when a causal relationship was conceivable. When both are conceivable, a causal relationship is simpler than a coincidence. At the same time, he avoided a common logical error called *Post Hoc Ergo Propter Hoc*, which is the assumption that Event A caused Event B simply because it occurred earlier in time. Here is a concrete example to illustrate the difference between

Ockham’s Razor and *Post Hoc Ergo Propter Hoc*. A nearby leaf blows away in the wind, and a rabbit runs in fear approximately half a minute later. Simply to assume that the rabbit was frightened away because the leaf was no longer present would be an example of *Post Hoc Ergo Propter Hoc*. A closer analysis may reveal that a hiker was walking past the area where the rabbit and the leaf had been. Because humans are much larger animals than rabbits, it would be extremely naïve to assume that the rabbit was coincidentally scared while a human was approaching. It would be simpler and less far-fetched to say that the rabbit mistook the human for a predator. Therefore, Ockham’s Razor would tell observers to conclude that the presence of the hiker caused the fear in the rabbit, which in turn caused him to run away. This report mainly deals with psychological concepts, which are more abstract than hikers, rabbits, and leaves. Although the interactions of such concepts are more complicated and subtle, the same governing laws of logic guide observers, including the author of this report, to conclusions.

The definitions of important terms in this report are as follows. A research question is one that must be answered by means of a scientific investigation. The null hypothesis is the “no” answer to the research question. The alternative hypothesis, which derives its name from the fact that it offers a choice other than the null hypothesis, is the “yes” answer to the research question. In general, a hypothesis is an educated guess that can be supported or falsified by an experiment. *H. sapiens* is the only surviving species of humans. There were other species of humans, to be sure, but all have been extinct since Prehistory.

Evolution is the accumulation of changes that occur as species adapt to their habitats. Isolated populations breaking away from their species and becoming a new species is a phenomenon called speciation. At one point in time or another, every species, except the original bacterium, which has been extinct since the Archean Eon, was founded by means of speciation. A political state, also known as a country, is an organization that independently governs a designated geographic region. In Latin, *Post Hoc Ergo Propter Hoc* literally means "after this, therefore because of this," and in logic it denotes the false assumption of causality based simply on how events are distributed through time. Ockham's Razor is the law of logic that states that a simpler explanation is a better one unless it can be disproven. Prehistory is simply the time before recorded history. In some contexts, it may date all the way from the Big Bang until the invention of written language. In this report, however, the term only refers to the time between the speciation of *H. sapiens* from *H. rhodesiensis*, which occurred sometime between 2,000,000 BC and 600,000 BC and the invention of written language. Reciprocity is the exchange of objects or actions for mutual benefit. Homeostasis is the equilibrium between variables that is required in order to sustain life.

The expected relationship to be either supported or falsified is a causal one between the independent and dependent variables. This relationship is summarized in the alternative hypothesis.

The independent variable is the speciation of *H. sapiens*. If political states resulted from the natural group dynamic of the species, the speciation of *H. sapiens* ultimately

caused the formation of the first political states.

The dependent variable is the formation of the first political states. The research question is essentially whether or not this event was caused by the independent variable.

In other words, the research question boils down to whether or not the speciation of *H. sapiens* rendered the much later formation of the first political states to be inevitable.

IV. Research Design

The author of this report evaluated the null and alternative hypotheses by comparing them with the conclusions and other important points of the source documents. Those documents can be found in the both Literature Review and References Sections.

V. Results

Because patterns of cooperation and defection must do well against other patterns that also do very well in order to survive for a long time, the concept of evolution helps to illustrate the manner in which such patterns compete with each other (Axelrod 1984). In a computer tournament, a pattern called HARRINGTON had been the only one among the top fifteen finishers in the second round that would ever be the first to defect, but it gradually ran out of weaker patterns of which to take advantage as it ran them out of existence (Axelrod 1984). Like its own victims before it, HARRINGTON became extinct by the thousandth generation of the third round of the tournament (Axelrod 1984). The pattern that defects on every turn, ALL D, can be replaced by TIT FOR TAT, which is basically eye-for-eye-and-tooth-for-tooth, when TIT FOR TAT

starts at only five percent of a population (Axelrod 1984). This supports the idea that co-operation has a strong tendency to be beneficial. In nature, cooperation starts at the first degree of relativity, but it can spread outward until any individual can cooperate with any member of the entire species (Axelrod 1984). This begins to support the alternative hypothesis. Political states depend on the ability of humans to cooperate no matter how distant the blood relation between them might be, even if it is so distant that it is colloquially considered non-existent. For example, a citizen in a democratic political state may vote for someone of a different ethnicity, which would occur across an extremely distant blood relationship.

Previous research has supported the idea that the supply and demand market system developed from the interactions of the self-concerned and other-concerned aspects of the human mind (Cory 2006). The same workings of the brain that are ultimately behind the basic principles of economics continue to drive all aspects of social interaction between humans to the present day (Cory 2006). Like most biological processes, the interactions between self-concerned and other-concerned parts of the human brain are regulated in an orderly manner so as to maintain homeostasis (Cory 2006). The same programming that drives the close family life of humans also enables their much broader social interaction (Cory 2006). The three main parts of the human brain are dedicated to self-preservation, affection, and combining the former two functions; these three main parts arose in that exact order through evolution (Cory 2006). As concrete evidence, reciprocity is a general tendency in all human cultures

(Cory 2006). Because concern for others is mentally integrated with preservation of one's self, each human has a psychological motivation to obey the laws of a political state for the sake of other citizens of that state. This provides further support for the alternative hypothesis.

Humans tend to attribute the behavior of others to general personality and their own behavior to circumstances at each moment (Mason and Macrae 2008). Humans have a unique capability to take the motivations of others into account (Mason and Macrae 2008). In order to determine a motivation in another, however, one must figure out whether the observed action is deliberate or accidental (Mason and Macrae 2008). These factors dictate both how humans react to each other's actions at each moment and how they remember each other's actions (Mason and Macrae 2008). The mental factors that led to this capability arose relatively recently in the Order Primates (Mason and Macrae 2008). Among other species, only the closest relatives of humans show similar capabilities, and even the closest surviving relatives of humans show these capabilities to a lesser degree (Mason and Macrae 2008). This explains why *H. sapiens* is the only species on Earth ever to create political states. A political state requires a justice system of one kind or another in order to deal with law-breakers. A justice system, in turn, requires an ability to determine the motivations of a criminal in order to issue a fair sentence.

Clans of early *H. sapiens* had means of punishing individuals who violated customs (Bowles and Gintis 1998). Such enforceable customs strikingly resembled laws enacted by political states, which later came about with

the invention of written language. This piece of evidence strongly supports the alternative hypothesis.

Political states are sometimes created through the mergers of smaller political states (Axelrod 2001). In any given case, several of the last prehistoric clans may have settled into one of the city-states that constituted the very first countries. This supports the alternative hypothesis in a relatively subtle way by implying that the formation of political states was the end result of increasingly large social groups, a phenomenon that had already been in progress within *H. sapiens* for tens of thousands of years. Common knowledge has it that the larger social groups of *H. sapiens* had been an advantage over *H. neanderthalensis* when it came to competing over some of the same prey. After the extinction of *H. neanderthalensis* around 30,000 BC, *H. sapiens* continued the expansion of social groups that had already presented a competitive advantage, ultimately culminating in the formation of the first political states few thousand years after the end of the Fourth Ice Age.

Humans around the world have a tendency to examine the cultures of other humans through the lenses of their own respective cultures (Hammond and Axelrod 2006). As unfortunate as this fact may be, this tendency helps to explain why a single global political state would not be sustainable. Together with the lack of global communication at the start of recorded history, this explains why *H. sapiens* created political states in the plural.

Altruism increases, and therefore so does cooperation, when an environment becomes more comfortable (Hammond and Axelrod 2005). Common knowledge has it that the environment inhabited by *H. sapiens*

became more comfortable at the end of the Fourth Ice Age, which occurred a very short time in evolutionary terms before the formation of the first political states. As such, this final piece of evidence is also a subtle support for the alternative hypothesis.

VI. Conclusion

By initially occurring in least five percent of the population, TIT FOR TAT can ultimately replace ALL D. The human brain and its evolution are behind the patterns of cooperation that occur within *H. sapiens*. Members of *H. sapiens* have a unique ability to decipher motivations by observing behaviors of each other. Humans have been able to force each other to obey certain norms ever since Prehistory. Since cruel patterns such as HARRINGTON have a way of exhausting themselves to extinction, benevolent patterns such as TIT FOR TAT are ultimately more advantageous.

Through one source document after another, the probable answer to the research question became increasingly clear. At the end of the process, the consensus of evidence provided an answer. The general consensus of the source documents falsifies the null hypothesis, thereby verifying the alternative hypothesis. The evolution of *H. sapiens* did directly cause the formation of political states.

This report is important because it demonstrates that, contrary to popular belief, political states are a natural result of human evolution. As mentioned at the end of the Literature Review, this report is also important because it is more convenient for readers to review this document; few readers search through all the separate source documents for this information.

