

# Evolutionary psychology, economic freedom, trade and benevolence

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**Abstract:** Our thesis is that the reason many of us today are inclined toward socialism (explicit cooperation) and against laissez-faire capitalism (implicit cooperation) is because the first type of behavior was much more genetically beneficial during previous generations of our species. There is, however, a seemingly strong argument against this hypothesis: evidence from human prehistory indicates that trade (implicit cooperation) previously was widespread. How, then, can we be hard-wired in favor of socialism and against capitalism if our ancestors were engaged in market behavior in past millennia? Although trade which is self-centered and beneficial (presumably mutually beneficial to all parties in the exchange) did indeed appear hundreds of thousands of years ago, benevolence was established in our hard-wiring very substantially earlier, literally hundreds of millions of years ago, and is therefore far more deeply integrated into the human psyche.

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## Introduction

Why do the overwhelming majority of people reflexively turn to government, rather than private enterprise, to solve perceived social ills? Why does so much of the electorate favor the minimum wage law to fight poverty? Why are tariffs so popular? Why have we learned so little or nothing from the failures of North Korea, East Germany, the USSR, Venezuela and Cuba that we would apply their failed economic philosophy to ourselves? Our explanation is based on evolutionary considerations: we are hard-wired in the opposite direction of economic freedom. This is why, taking the complete prehis-

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tory and history of the world over the entire globe, there have been so few episodes of freedom, laissez-faire capitalism, and liberty.

It might be noted at this point that it sometimes is questioned whether in fact there are biases in favor of socialism rather than capitalism. This is not a simple matter, because it can turn on complexities over ownership of the means of production versus control over more egalitarian distribution of goods and services regardless of their formal ownership, on the one hand, the temporal frame of reference that is used, and whether one is referring to the number of people governed or the number of countries in which they live. For the purposes of this paper it is sufficient to note that within about a century and a half of the time that the term “socialism” was coined, about 60% of the human population (not necessarily the number of national entities) were living under one or another form of socialist governance (Muravchik 1999, 2003).

More recently in the United States (a supposed bastion of free markets and economic liberalism) the Libertarian Party usually polls around 1% for Presidential elections. The Libertarian party reached 3% in the 2016 elections (between Donald Trump and Hillary Clinton), an election which almost saw Democratic Socialist Bernie Sanders upset Hillary Clinton as the Democratic nominee. Presently, Alexandria Ocasio-Cortez leads a strong socialist-leaning movement within the Democratic Party. The socialist ethos has attained broad geographical extent, historical persistence, and current relevance in a way that economic liberalism/free markets/Libertarianism has not.

“Hard wiring” explanations imply bases that are rooted at least partly in biology, and not entirely in culture. Our paper, then, can be seen as part of an ongoing critique of the Standard Social Science Model, which takes the opposite point of view (Pinker, 1994, 2002; Brown, 1991; Degler, 1991; Barkow, Tooby and Cosmides, 1992).

Here is a very powerful argument in favor of biological as opposed to cultural explanations of modern human behavior:

- It is a curious fact about the intellectual history of the past few centuries that physical and mental developments have been approached in quite different ways. No one would take seriously the proposal that the human organism learns through experience to have arms rather than wings, or that the basic structure of particular organs results from accidental experience. Rather, it is taken for granted that the physical structure of the organism is genetically determined, though of course variation along such dimensions as size, and so forth will depend in part on external factors ....
- The development of personality, behavior patterns, and cognitive structures in higher organisms has often been approached in a very different way. It is generally assumed that in these domains, the social environment is the dominant factor. The structures of the mind that develop over time are taken to be arbitrary and accidental; there is no ‘human nature’ apart from what develops as a specific historical product ...
- But human cognitive systems, when seriously investigated, prove to be no less marvelous and intricate than the physical structures that develop in the life of the organism. Why, then, should we not study the acquisition of a cognitive structure such as language more or less as we study some complex bodily organ? (Chomsky, 1975)

In section II of our paper, we claim that there are evolutionary reasons that can explain these undeniable facts. There are only two ways to cooperate with each other: Explicitly, through benevolence or central direction, or implicitly, through markets. We maintain that humans are hard wired through evolution for the first, but not, or at least not to anything like a comparable extent, for the second. In section III where we discuss what primate practice and morality can tell us about capitalism, we present evidence that early *Homo sapiens* traded with each other. There is evidence for long-distance exchange of materials as well as mining before 100,000 years ago (McBrearty and Brooks, 2000; Thompson, 2014). The burden of section IV is to reconcile the contradictions between these two preceding parts, sections II and III. Our contention is that we are more hard wired for benevolence, since as the species *Homo sapiens* we share this as part of our common mammalian heritage dating back about a hundred million years, and less hard wired for markets, which we attained only roughly a thousand-fold later, around several hundred thousand years ago. In terms of genetic evolution, the potential for an additional thousand-fold multiplier (5,000 to 10,000 human generations) is meaningful.

## 2. Evolutionary psychology

Evolutionary psychology<sup>4</sup> is the theory that certain aspects of present-day human behavior can be explained to some significant extent on the basis of what types of actions were conducive to survival, and thus to transmitting genetic material in the next generation, over hundreds of thousands of years.<sup>5</sup>

States Hayek (1988, p. 11): "... man's instincts ... were not made for the kinds of surroundings, and for the numbers, in which he now lives. They were adapted to life in the small roving bands or troops in which the human race and its immediate ancestors evolved during the few millions years while the biological constitution of *homo sapiens* [sic: *Homo sapiens*] was being formed."<sup>6</sup>

In this paper we utilize the explanatory framework of evolutionary psychology, and draw upon evidence afforded by archeology and evolutionary biology, in an attempt to account for why many people find attractive such phenomena as government intervention, regulation, control, and socialism, while very few people favor laissez-faire capitalism; why it is so difficult to explain to laymen that rent control, minimum wages and protectionist interferences with free trade are not only uneconomical but also immoral; why profit maximization and price gouging are dirty words in many of our leading

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<sup>4</sup> On this see Dusek (undated), but also see Griffiths (undated), Horton (2010), Webster (2007).

<sup>5</sup> For a representative sample of this school of thought, see Axelrod (1984), Axelrod and Hamilton (1981), Dawkins (1976, 1986, 1995), Field (2004), Ghiselin (1978, 1987A, 1987b), Pinker (1994, 1997, 2004), and Wilson (1975).

<sup>6</sup> For more in the vein, see Cantor (2013), Lichter, Lichter and Rothman (1991), Lichter, Rothman and Lichter (1986), Reed (2017) and Rothman, Nevitte, and Lichter (2005).

circles; why Smith's (1776) "invisible hand" is not much relied upon amongst pundits, clergy, sociologists, social scientists and others invincibly ignorant of economics.<sup>7</sup>

Let us consider an example of a sociobiological insight. As a thought experiment, consider two hypothetical tribes, *A* and *B*. In the former case, males confront and drive off or fight any large predators that threaten their group. In the latter, it is women who might be imagined to provide such defense. Biologically, females, not males, set the limits on reproduction. Germany and Russia both suffered heavy *male* losses in World War II. The number of able-bodied men between the ages of 20 and 60 was dangerously reduced. And, yet, it was as if this was not the case as far as numbers of births in the next generation from both these countries were concerned. Imagine if it was the *women* from Germany and Russia who fought and sustained this level of casualties. Then, there would have been a greatly reduced next generation in these two nations. Thus, tribes such as *B* are at an evolutionary disadvantage and we are less likely to have descended from them. As a result, we are more likely to be hard-wired for male aggression, with males protecting females, who in turn necessarily nurtured infants and children, etc.

What does all this have to do with the widespread rejection of free enterprise? Before we get into that, let us consider one objection to this hypothesis: we have had episodes of laissez-faire capitalism in our history. If we were biologically conditioned against such a code of living, how can these events have occurred? For example, with the salient exception of slavery, the economic system of the U.S. while not perfectly attuned to

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<sup>7</sup> There are other explanations for this phenomenon, but, in our opinion, insights from evolutionary biology offer the greatest understanding. What other hypotheses are there? One of them is the "seen versus the unseen" (Bastiat, 1845, 1964A, 1964b; Hazlitt, 1946). When government taxes people and builds a highway or battleship, we can all see these items; but, we cannot see the thousands of air conditioners, toasters, wrist watches, haircuts and other goods and services that could have been created with these monies, but were not. Another explanation is the time dimension: when a minimum wage is inaugurated, people do not lose their jobs the very next minute or even day; sometimes it takes months for the employer to rearrange matters so that all those with marginal revenue products below the level specified by this law are fired. So, the minimum wage law is credited for raising wages, but not debited for promoting unemployment. See on this: Becker, 1995; Burkhauser, Couch, Wittenburg, 1996; Deere, Murphy and Welch, 1995; Gallaway and Adie, 1995; Hazlitt, 1946; Landsburg, 2004; Neumark and Wascher, 1992, 1995; Sowell, 1995. Here is Foster's (2014) explanation: "why haven't our moral sentiments evolved to appreciate capitalism...? One key reason is that, under capitalism, people can have their cake and condemn it too. We don't have to understand how markets work to thrive within them any more than we need to read and absorb a book on biology in order to stay alive. Although we are natural traders, we are born reflexively to believe in simplistic centrally-planned solutions, and that local preference and self-sufficiency are 'good.' Similarly, many of the processes and results of capitalism are objectionable to moral sentiments that were formed in a very different environment from that in which we now live, an environment where wealth and oppressive power tended to go together. The even more significant reason why the lessons of bad policy are not 'learned' is that economic ignorance and outdated moral assumptions are effortlessly – indeed largely subconsciously – promoted and exploited by power seekers. Inequality demands redistribution. Corporate power requires 'countervailing' power. Economies require 'managing.' The world needs saving."

economic freedom, was a reasonable facsimile of such from its inception to at least the progressive period in the late 19<sup>th</sup> century (Kolko, 1963; Hughes, 1977). And, too, England during its industrial revolution at least approached this ideal. Other historical counter examples to our thesis include ancient Ireland (Peden, 1977), ancient Iceland (Friedman, 1979; Long, 1994; Solvason, 1992), and modern day Singapore and Hong Kong (Gwartney, *et al.* 1976), which are the economically freest countries in the modern era.

The reason we reject these instances and defend our claim that by and large humanity is not very receptive to laissez-faire capitalism, is that these cases are too few, far apart, involved very few people and have tended to be unenduring. Over the entire broad history of our species, these exceptions are very much in the minority. There are no cases at all in Latin or South America, none in Africa, none on the European or Asian continents. And, even in the instances that did occur, they took place for a precious few years, mostly in small territories, apart from the U.S.

No, the typical human response to economic freedom is instead to support tariffs, rent control, minimum wages, government regulations, and to attack profit-seeking, price gouging, large sized firms, profiteering, collusion, cartels, predatory price cutting, underselling. Two of the authors of the present paper hail from New Orleans. In the aftermath of Hurricane Katrina, prices for flashlight batteries, candles, orange juice, milk, water, gasoline and other such staples sky-rocketed. All economists know that the function of these changes is twofold: rationing scarce goods, so that more people have access to limited resources, and, a call for help to the outside world to bring these items to this beleaguered city. What was the reaction of not only the local politicians but, more important, virtually the entire populace? It was to condemn out of hand all such price rises as stemming from greed, selfishness, capitalism, etc. This was so heavily and deeply ingrained, and reflexive on the part of the local population that we see it as emanating, at least in large part, not only from miseducation, but, also, from biology.<sup>8</sup>

How, then, do sociobiological considerations lead to the overwhelming human experience of dirigisme? It is because we are biologically inclined toward explicit, not implicit, cooperation. Explicit cooperation encompasses benevolence, which is rooted in maternal care, with such behaviors having depths that exceed a hundred million years. While many mammalian groups also are structured along lines of ancient shared genetic heritage, in human families such structures of relationship are more explicit. In studies of the evolutionary past, archeology has given time, depth, and detail to the knowledge of the biology of our human species and its immediate antecedents. For roughly two million years in the genus *Homo*, culture has shaped the human brain into a biological organ increasingly capable of devising and maintaining a relatively elaborate set of complex social relationships (Sahlins 2005), kinship and its extensions.

Recent work in cultural anthropology deals with the myriad of ways in which primary family relationships have been broadened into these webs of kinship, real and fictive. *A priori* it was possible to posit that in most cases, tribes that practiced friendliness toward

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<sup>8</sup> For a particularly piquant bit of evidence of this phenomenon, see Munger, 2007

their neighbors had a better chance of survival and the passing on of their genes to the next generation, than those which did not. Within any group, if *A* helps *B* when *B* is sick, and, next month, *B* helps *A* when *A* cannot hunt for food, then both stand a better chance of prospering, than when each is strictly on his own. Amicable relations with bordering tribes, cemented by the exchange of goods, would broaden the economic base and help provide access to wider resources in the face of emergencies. Exchange of mates and reckoning of kinship extends such simple dyads to wider webs of support sometimes referred to as clans. So, there can be a biological payoff for this sort of compassion. Those without any shred of it tended to die off or be supplanted by populations that had it in greater measure.<sup>9</sup>

Interestingly, ethnographic studies have ratified the somewhat abstract conception presented above, documenting that exchange in non-market societies is shaped by social relationships (Sahlins 1972). In such societies, the exchange of finished goods is largely kinship-based, and moreover varies according to the social distance of the parties involved. Within the household-kinship group, the largely altruistic transactions are marked by *general reciprocity*. *Balanced reciprocity* may take place beyond the household but within the same community. *Negative reciprocity* is more likely to occur with those outside the community.

Implicit forms of cooperation, involving marketplace interactions and trade, are different from explicit cooperation, though they can be seen as forms or extensions of negative reciprocity. In operative terms, it is not so much that the occurrence of benevolence and friendliness imply socialism, or that hostility and warfare necessarily are associated with the more formal market structures of capitalism. Rather, paleontological and ethnological studies indicate that there are webs of biological relationship that are pan-mammalian, with increasingly elaborate forms of maternal and other nurturing behaviors evolving over hundreds of millions of years. Archeology and ethnology show that, from this ancient and rich biological heritage, our own lineage within the genus *Homo* emerged over about two million years ago, along the way evolving the conscious knowledge of relatedness that comprises kinship. Ethnographic studies of human societies have shown that the degree of social distance, particularly closeness of kinship, affects the kind of reciprocity that is practiced.

When we live in a society of millions, tens of millions, hundreds of millions not to say billions of people, it simply is impossible to cooperate with all of them, or even most of them, directly, through anything resembling benevolence or central direction.<sup>10</sup> The only way we can collaborate with any large number of people is via markets and trade. But, to do so, we must have an appreciation of or at least be neutral toward, price

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<sup>9</sup> But not all of them. Hitlers, Maos, and Stalins have existed, and unchecked power still is coveted by many who would be national leaders. Tolerance of dictatorial behavior could be evidence that in the past force might have been needed to withstand predators of far greater strength and speed than our forebears could handle individually, or to organize for survival against hostile human groups, but the extension of behavioral tendencies from hunting and gathering groups to nation states is tenuous.

<sup>10</sup> Charity is far less extensive.

changes, gouging, profits, profiteering, or large-scale enterprise. But all too many people are not so inclined. When the price of gasoline rises, as it has in many countries, consumers often riot. When college tuition increases, as it did in Great Britain in 2010, students take to the streets and burn cars. In many countries, when the price of bread rises, there is apoplexy on the part of the populace. There is very little appreciation of the role that higher prices play in the economy: rationing present stocks and calling forth more supply. Mis-education in economics only goes so far as an explanatory variable. In our view, the cause lies, also, deeper, in evolutionary biology and prehistory.

### 3. What primate behavior can tell us about the roots of capitalism

As already noted, humans have a heritage that is vertebrate, particularly mammalian at its base, with all that implies about the centrality of adaptive altruism in the form of nursing and extended care of offspring. Beyond that evolutionary foundation our own mammalian subdivision, the taxonomic order Primates, includes a spectrum of species that ranges from the nearly basal mammalian (controversially, tree shrews; canonically, mouse lemurs) to the marginally proto-human, exemplified by chimpanzees (with its two conventionally recognized species, *Pan troglodytes* and *Pan paniscus*, sharing 99.6% of their genes in common with humans (Prüfer, *et al.* 2012).

Some species of the most primitive living prosimian primates (lemurs, lorises, and their kin) are minimally social, with many living solitary lives apart from mating. But the larger-brained monkeys, such as the New World capuchins and the Old World macaques and baboons are highly social, with diversely hierarchical within-group behavioral patterns that correlate broadly with habitat variation. And the great apes, including chimpanzees, show the beginnings of what genuinely can be called proto-human behavior, in the sense of regionally-differentiated traditions that are transmitted purely by cultural, not genetic, mechanisms (McGrew, *et al.* 1978, Whiten *et al.* 1999, 2005, Bonnie, *et al.* 2007).

By studying some of these pre-human primate species, we can see what kinds of activities might have served as pre-adaptations to human behaviors reflected in the intergroup (tribal) exchange of goods and services, trade networks, and elementary implicit capitalism.

As a pertinent aside, the term “pre-adaptation” often is seen as a counter-intuitive concept: How could a population evolve traits that would suit it to some future condition before the appearance of environments that could select for them? The answer is that the anatomical or behavioral characteristic that seems in retrospect to have been suited to the future environment evolved first as a genetic adaptation in response to some *past* environment in which it also had a utility, though a somewhat different one. Invertebrate evolution, the limbs that dragged early tetrapod salamanders over the ground previously were the supports for fins that propelled their piscine ancestors through rivers and ponds.

There may be uniquely human emergent behaviors, but nonetheless, they emerged from *something*. And their antecedents still can be seen in the behaviors of various primate “living fossils” that preserve stages in our pre-human ancestral past.



Human trade is one such emergent behavior. It is of specific interest in the context of this paper because although it falls far before the earliest human recorded history, its origins and approximate antiquity are documented by archeological evidence to be sufficiently ancient (roughly 100,000 years or so) as to have some phylogenetic implications, while having a duration that still is a tiny fraction (about 1/1000) of fundamental mammalian maternal and other nurturing behaviors. There is a growing amount of evidence that past human groups exchanged goods with one another. By trade, in formal terms we mean market exchange, although it has antecedents. In an informal sense, symbiosis is an exchange. For example, cleaner-fish has a mutualistic relationship with their hosts, exchanging dental services for food. The cleaner eats parasites and the host fish that is cleaned gets rid of them. But this sort of exchange does not involve negotiations or price setting. Nor do we mean nepotistic exchange; i.e. that which occurs among the most closely-related (e.g. nuclear family) members of the same species. For example, in a loose sense, we may say that a mother and her child carry on exchange of goods and services. They certainly “negotiate,” but this does not constitute market exchange. The “prices” at which “goods” exchange in such cases are largely determined by physiological mechanisms operating within the genetically structured family relationships of the people involved. The terms of trade are grounded in emotion and close kinship. By market exchange in sharp contrast, we mean to include trade between only distantly related members of the same species, with prices determined by the subjective valuations of the traders for the commodities. Market exchange relies on the large-scale division of labor within and across large populations.

How is it that scientists can infer the existence of trade among geographically widespread human populations? They cannot rely on written history alone, as exchanges believed to have any phylogenetic foundations clearly must extend many generations farther back into the realm of prehistory. Anthropologists must use circumstantial evidence, strung together with theoretical threads. Among the body of evidence, they have mustered is that:

- 1) Extant humans have exceedingly large brains that are known from direct fossil evidence to have increased steadily in volume over the last four million years until reaching a plateau, and then appeared to decline moderately in volume over the last few tens of thousands of years (reviewed in Eckhardt, 2000). Not all of the reasons for the great increase (roughly a tripling over three or four million years) are known, but they are likely to include ad hoc tool use followed later by tool making to culturally transmitted patterns, group cooperation in hunting, and reckoning of kinship and intergroup relations over increasingly large networks. The large brains of extant humans that appear pre-adapted to trade probably represent previous adaptive responses to needs as diverse as remembering the location of water and the best stone for tools, recalling past social interactions within and among groups, and cultural responses to increasingly complex material cultures.
- 2) Discoveries of raw materials far from their geographic origin, and caches of finished tools amassed by early humans at least a hundred thousand years ago. We present detailed evidence on this point later in the paper.
- 3) A long-continued sequence of phyletic evolution, with larger-brained populations descended from smaller-brained antecedents without clear evidence of splitting into contemporaneous species. Roughly the first two million years of this evolutionary anagenesis took place in Africa alone, followed by subsequent expansion into Eura-



sia, and only much later into the Pacific islands, Australia, the Americas, etc. Ignoring specialist in-group arguments about hypothetical lineage splitting and the existence of possibly co-existing species (irrelevant here), there is a sequence that is well-documented by fossil evidence from the earliest known populations that have entered the human niche by using bipedal locomotion (Galik, *et al.* 2004) with as yet unknown brain volumes that probably were chimp-sized ( $\geq 400$  ml), through australopithecines beginning with brain sizes similar to those of chimps, then ranging larger through time to *Homo erectus* around 2 to 1 or so million years ago. Over time and space, *Homo erectus* brains ranged from about 600 ml to roughly double that, before the continued phyletic evolution into our own species (Lordpikanidze, 2013). *Homo sapiens*, as in our Neanderthal predecessors, currently exhibit brain volumes ranging from 1000 to 2000 ml with an average around 1400 ml (reviewed in Eckhardt, 2000).

- 4) Agriculture represents a significant shift in the ecological niche. Among other things, it produced surpluses with larger temporal and spatial differentials than possible for most hunters and gatherers, with very rare exceptions such as US Northwest Coast Native Americans who had access to abundant sea mammals and vast salmon runs, both producing food that could be stored easily by drying and smoking.

The preceding points indicate that there are elements in the human evolutionary past that could have laid the groundwork for markets—venues for the exchange of one good or service for another, e.g. dried fish or meat in payment for huge seagoing dugout log canoes as in the Pacific Northwest prior to European contact. If the market exchange were present, how might we recognize it? First, this phenomenon relies upon and promotes the division of labor. This division might occur along gendered (women providing greater parental investment in offspring, male protection entailing greater risk of injury or death), tribal (as from the ethnographic present, when inland tribes exchange meat and forest fruits for fish and other products from the sea), or occupational lines (after the origin of agriculture, elaborated craft products exchanged for grain and the yield from animal husbandry). Given technological and economic specialization beyond biologically-based family lines, a system of redistribution must be present. Among the Northwest Coast Amerindians, this was accomplished in part by the seemingly strange but economically effective custom of the potlatch, in which conventional displays of economic wealth to gain prestige also served to distribute resources more widely in society. In more conventional markets, this is done via trade. Such commercial interaction is most easily facilitated through the medium of money. Thus, evidence of money would constitute solid – though very late – support for more formal market exchanges than those already documented by the archeological record.

Agriculture seems to have catalyzed the need for written records. The earliest known writing found in the clay tablets and envelopes of Sumeria that recorded market transactions five thousand years old (Schmandt-Besserat 1977, 1982, and 1992). This was not epic poetry. It constituted business receipts. Such commercial correspondence predates the *Epic of Gilgamesh*—the earliest known written story—by several hundred years. Markets must thus have existed even before writing.

Whence markets? Large accumulations of unfinished stones have been found in common stockpiles. Moreover, these stones did not all come from the same source. They

emanated from different places, indicating that they were brought to a central depot. By the late Paleolithic era, unfinished stones were transported 100-200km from quarry to destination (Ofek 2011).

By the beginning of the Mesolithic era, around 12,000 years ago people began to settle down into permanent locations, shifting from collecting and hunting to husbandry and agriculture to provide sustainable food supplies in many locations. Even long prior to this time humans took part in long-distance trade between bands for rare commodities (such as ochre, which may have had a ritual as well as artistic functions)<sup>11</sup> as well as other raw materials, as early as 12,000 years ago in the Middle Paleolithic. Trade among bands may have appeared during the Middle Paleolithic because it enhanced survival value by making a possible exchange of resources and commodities during times of drought and famine (Armesto, 2003).

More detailed evidence for long distance trade and transport of valued materials is increasingly available (Bednarik, 1992). Shells for body ornaments, red ochre, resin, spears, shields, axeheads, spear-throwers, boomerangs, millstones, dilly bags, fishing nets, digging sticks, and ornamental feathers were traded widely in Australia, virtually crossing the continent in some cases (Cooper, 1948). Unworked pieces of amber have been found in Upper Paleolithic dwelling caves in Europe at the Grotte d'Aurensan in the Hautes-Pyrénées, at Judenes in Austria, at Kostelík and Zítmy in Moravia, at Cioclovina in Romania, and at Gough's Cave near Cheddar in Somerset, England. All of these examples are far from natural sources of resin (Burdukiewics, 2009). Among other examples, the Epipalaeolithic site of Baños in the Mortero Gorge area has perforated *Columbellae rusticae* shells that come from coastal areas (Beltrán and Royo 2008: 75). Adjacent to the Levantine area in Catalonia, beyond the north-east end of the Levantine area, the hammers used in the Neolithic salt mine of Cardona came from Collserolla, and variscite from Gavà is found in some of the Cardona burials. Moreover, in that whole area of Catalonia, honey flint from Provence (France) and obsidian from Sardinia was being used, and shell pendants, probably from the River Ebro delta were also deposited in burials (Terradas *et al.* 2014; Weller and Fíguls 2008). Such artifacts had use value, and to some extent, their widespread distribution was an indirect measure of such value.

Whence money? Carl Menger (1950) explained that money could not have been invented by fiat. This is not to say that a fiat currency cannot exist, only that it could not have been the origin of money as an institution. The reason for this is that if original money were fiat, it would have had no value to anyone; no one would have already been using it for ordinary purposes. Menger explained that money, like language, evolves endogenously.

Barter is inefficient. It requires the double coincidence of wants: *A* must have what *B* wants, and *B* must have what *A* wants, each in the right quantities and at the same time, at an agreed upon price. Otherwise, *A* might need to string together multiple chains of barter before he can acquire the desired goods. However, the smarter ones among us

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<sup>11</sup> Boehm (1999) and Henahan (2002).

would realize that some more marketable goods are more highly demanded than others. Let us call such a good, “moolah.” People will be more likely to accept moolah in barter simply because they know others are slightly more likely to accept it, and can therefore shorten the long chain of such exchange. As *A* now accepts moolah, he adds to the growing list of people who do so, which further increases the value that moolah has to others. Slowly, the list of people accepting moolah grows to consist of virtually the entire population, by which point moolah is money, a generally accepted medium of exchange.

Money has had many different forms. It has consisted of gold and silver, giant stone wheels (in Yap), cigarettes (in prison: Radford, 1945), feathers, and wampum beads. This last currency provides a crucial link to our story.

Beads are likely to have been our earliest money, as well as our first form of accounting (and, by extension, of writing.) How many sheep does a man have? He may not be able to count that high. In fact, there still exist Amazonian tribes<sup>12</sup> that do not have proper numbers. They have one, two, and many. How to keep track? All that is needed is a one-to-one correspondence between the item to be counted—say, sheep—and the counting mechanism. For us today, this counting mechanism is a natural number, like 103. But for the innumerate, it is simply equal to the number of beads that someone has on his necklace. How many is that? There may be no name of for that number in a given language, but its speakers do not need one. They can see whether or not they are missing a sheep by seeing whether there still exists a one-to-one correspondence between each animal and each bead. What if *A* were to trade *B* some sheep for some cows? How many sheep does *A* have, now? During trade, the beads could be “counted”, removed, and re-assembled on new necklaces. The simplicity of this practice renders beads likely first money.

We have ample evidence of beadwork from thousands of years ago. The oldest shell beads date 82,000 years ago, and were found in a cave in Morocco.<sup>13</sup> In the Blombos Cave in South Africa, archeologists have uncovered beads made from shells of a pea-sized snail that lived in a nearby estuary. These beads were fashioned 75,000 years ago. Forty thousand year old ostrich-eggshell beads were found in the Kenyan Rift Valley. In a burial site at Sungir, Russia, 28,000 years ago, archeologists have found interlocking and interchangeable mammoth ivory beads. Each bead may have required one to two hours of labor to manufacture (Szabo, 2002). Why do this?

The ubiquity of the beadwork implies that it had some function, a use, in addition to decoration.<sup>14</sup> This use initially may have been simply ornamental, with at least tangential relationship to sexual attractiveness and hence a reproductive advantage. But as with other examples of pre-adaptation, beads and other ornaments could have been adapted

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<sup>12</sup> For example, the Piraha tribe (Frank, *et al.* 2008) have words for “one,” “many,” and “more” but no precise numbers.

<sup>13</sup> CNRS (2007).

<sup>14</sup> For a modern defense of this thesis, criticizing claims to the contrary by an anthropologist, see Murphy (2011).

for other functions that may have contributed more directly to survival. That is, ornaments probably were evolutionarily functional in some respect. Collecting and making necklaces must have had an important selective benefit, since it was costly, and yet widely undertaken. Put another way, spending hours upon hours to fashion a supposedly useless ornamental trinket seems inconsistent with subsistence living (but for a seemingly contradictory perspective see Sahlins, 1968). What was their use? We have already hinted that at some point beads came to serve a useful accounting-monetary exchange function.

Whence implicit cooperation? A “tit for tat” style of retaliation strategy has been shown to overcome the prisoner’s dilemma in repeated games, and encourages cooperation (Axelrod, 1984). As with cartels, this strategy is more effective with smaller groups. Also, public reputation can motivate cooperation. However, reputational beliefs can suffer from two major kinds of problems: reckoning precisely who did what, and at what cost. The need to remember faces and favors is a major cognitive hurdle, but one that most humans find relatively easy to overcome. Our increasing brain mass made such memory possible and subsequently facilitated trade by allowing reputational data to be collected, remembered and disseminated. Of course, our brains are not infinitely large nor are our memories perfect. Money helps fill this deficiency by providing a record of debt. A string of ten beads can symbolize a debt of ten sheep, for example. Thus, money facilitates credit.

Whenever two parties (people, tribes, etc.) meet regularly, information about the other is gained, trust develops, and further trade is facilitated. But what of tribes who meet infrequently? Having less experience with each other, there is less information, less trust available, and thus less trade. Money could have helped surmount this problem as well. Before contract law, “gift giving” contained an implicit obligation to reciprocate. A classic example is the Kula Ring system of ceremonial exchange among islanders in Papua New Guinea (Malinowski, 1922).

Along with community dishonor and punishments ensuing if the implicit obligation was not met, such exchanges of gifts were perhaps the most common motivators of reciprocity in delayed exchange, and is still common in the variety of informal favors we do for each other. (She invited me to her wedding, I should invite her to mine.) The gift of a string of 10 beads could be an implicit promise, an IOU, to return one sheep per bead.

According to Mary Stiner, “Ornamentation is universal among all modern human foragers” (New York Times, 2002), so it might be argued that ornamental objects can be collected for the sheer pleasure of possessing them (not for any explicit proximate reasons). Such ornamentation is nearly universal across human cultures. Ornamental beads, for example, have been found dating back approximately 42,000 years ago and can be found in sites from western Asia, Eastern Europe and Africa (Kuhn, Stiner, Reese, and Güleş, 2001). One of the immediate proximate motivations is decoration. For an evolutionary psychologist, such behavior has a good ultimate explanation, in terms of natural selection. But it has no proximate rationale other than pleasure. Thus, it is a prime candidate to be a genetically evolved pleasure that motivates the behavior. In other words, we developed a liking for decoration over millennia of use— then turned that use to other purposes, thus converting goods with use value for decoration to money for trade.

Thus arose the human tendency to collect rare items, and especially jewelry. Collectibles such as beaded jewelry arguably constitute proto-money.

#### 4. Reconciling hard-wiring for socialism with early trade

In section II, we argued that modern man is biased against free enterprise because of the lack of much hard wiring for it. We are biologically disposed of in the direction of socialism, communism, liberalism, progressivism, and dirigisme. Why? Because sociobiological considerations impel people toward explicit cooperation or benevolence, and they see these collectivist philosophies as compatible with that perspective. People are philosophically not at all or at the very least much less receptive to the attributes of the free market which include self-seeking, greed, selfishness, profiteering, price gouging, etc. This is due to the fact that in the early days of our species, and in fact for vast millennia preceding them, there was a premium placed not on free enterprise, but on cooperation and mutual aid: helping each other in the face of inclement weather, sickness, hostile animals, etc.

However, our section III seems to undermine this claim of ours, in that it attests to the documented facts that some very early human populations did indeed engage in trade, and on, perhaps, an everyday scale. How to reconcile these seemingly inconsistent elements of our paper?

Our reconciliation is as follows. Human trade is only a relatively recent phenomenon, biologically speaking. Benevolence is much deeper, and probably far more long-standing in our genetic code. It is an aspect of human beings that stretches far back, past even the earliest human prehistory, all the way to our roots as mammals, who also exhibit explicit cooperation, but not trade. Our reconciliation is that yes, earlier humans traded, and we also may be, therefore, somewhat biologically disposed of in the direction of commercial interaction. But these events took place only tens or at most a hundred or so thousand years ago. Far more deeply embedded in the human psyche is our tendency toward explicit cooperation, or benevolence, or altruism, and therefore this constitutes a far stronger impulse in our decision-making. Biologically speaking, explicit benevolence triumphs the implicit trade variety.<sup>15</sup> We as a species are predisposed not to accept the findings of economists to the effect that the “invisible hand” of Smith (1776) can function at all, let alone to the degree necessary to embrace laissez-faire capitalism as the predominant social and economic order. Yes, some of us, sometimes, support free enterprise, but this acceptance is shallowly rooted, and limited to a few. Much more deeply embedded in us is a rejection of this economic philosophy and support for its very opposite.

We all know that Bambi’s mother takes care of him. We witness household pets such as dogs and cats engaging in benevolent activity with each other, particularly from mother to offspring. Altruism has been confirmed in a number of studies of less well known and less popular creatures. Denault and McFarlane (1995) report as follows:

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<sup>15</sup> Trade, too, is benevolent; it, too, is mutually supportive in that there are necessary gains from it at least in the *ex-ante* sense.

“Reciprocal altruism is an example of social behavior that has generated much interest among evolutionary theorists, but relatively few well documented case studies. Among mammals, reciprocal altruism has been reported for the dwarf mongoose, *Helogale parvula* (Rood 1983), naked mole rats, *Heterocephalus glaber* (Jarvis 1978), impala, *Aepyceros melampus* (Hart and Hart 1992) and a few other species, but the best known and most intensively studied example is the regurgitation of blood-meals by successfully foraging adult vampire bats to unsuccessful individuals.”<sup>16</sup>

Other experiments with animals that demonstrate cooperative behavior include: Epley and Rosenbaum (1975), Robinson and Huber (1974), Łopuch and Popik (2011), Packer (1977), Seyfarth and Cheney (1984), Krebs and Davies (1978), McNab (1973), Park (1991). Our common ancestry with many of these species traces very far back to the early mammalian evolutionary radiation.

## 5. Conclusion

The reason libertarianism, free enterprise, laissez-faire capitalism is such a hard sell is because we are hard wired through biology for explicit cooperation, benevolence and some versions of socialism, but not for implicit cooperation, i.e. free markets based on private property rights. Although there is some evidence for late Paleolithic trade around 100,000 or so years ago (5000 generations), and convincing evidence for record keeping and money of sorts at least near the time of the origin of agriculture about 10,000 years ago (500 generations), these occurrences are evolutionarily shallow in relative terms. In contrast, explicit cooperation goes all the way back to the time when we first became mammals, hundreds of millions of years ago -- *more than five millions of generations*.<sup>17</sup> There is little wonder that explicit cooperation feels more “natural.” It does probably because it is very ancient. And implicit cooperation feels less natural because it is mediated culturally rather than or much more than biologically.

In closing, we note that it is not entirely impossible that there are some evolved predispositions toward implicit cooperation. After all, the human species has not remained static genetically since the origin of agriculture. Changes within our relatively recent evolutionary past (the last ten thousand years or so) have given rise to multiple polymorphisms (the situation for genetic loci at which multiple variants are present within a population at frequencies above recurrent mutation levels). Polymorphisms are known for resistance to malaria Allison (1954), for the persistence of the enzyme lactase into adulthood (Simoons 1970); families are known with genetic variants that affect speech and language development (Vargha-Khadem, *et al.* 1995) as well as writing (Berninger and Richards 2010). Whether implicit cooperation might show such incipient diversity in genetic patterning is an interesting question, but beyond the scope of this paper.<sup>18</sup>

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<sup>16</sup> See also Trivers (1971).

<sup>17</sup> Even some reptiles, snakes, turtles, aid their young, so this phenomenon may go back even further in time.

<sup>18</sup> It is important to note that some writers take the very opposite viewpoint to the one articulated in this paper. For example, Arnhart (1998, 2005, 2009, 2010) maintains that sociological hard-

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## References

- ADDESSI, E., CRESCIMBENE, L. and VISALBERGHI, E. (2007). Do capuchin monkeys (*Cebus paella*) use tokens as symbols? *Proceedings of the Royal Society B* 274: 2579-2585. DOI: [10.1098/rspb.2007.0726](https://doi.org/10.1098/rspb.2007.0726)
- ALLISON A.C. (1954). Protection afforded by sickle-cell trait against subtertian malarial infection. *British Medical Journal* 4857:290-294.
- ARMESTO, F.F. (2003). *Ideas that Changed the World*. New York:Dorling Kindersley Limited.
- ARNHART, L. (1998). *Darwinian Natural Right: The Biological Ethics of Human Nature*. Albany: State University of New York Press.
- ARNHART, L. (2005). *Darwinian Conservatism*. Exeter, UK: Imprint Academic.
- ARNHART, L. (2009). *Darwinian Conservatism: A Disputed Question*. Exeter, UK: Imprint Academic.
- ARNHART, L. (2010). "Darwinian Liberalism." July 12; <http://www.cato-unbound.org/2010/07/12/larry-arnhart/darwinian-liberalism>
- AXELROD, R. (1984). *The Evolution of Cooperation*. New York: Basic Books.
- AXELROD, R., and HAMILTON, W.D. (1981). "The evolution of cooperation." *Science*, 211, 1390-1396. DOI: [10.1126/science.7466396](https://doi.org/10.1126/science.7466396)
- BARKOW, J., COSMIDES, L. and TOOBY, J., eds. (1992). *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*. Oxford University Press.
- BASTIAT, F. (1964a). *Selected Essays on Political Economy*. New York: Van Nostrand.
- BASTIAT, F. (1964b). *Economic Sophisms*. New York: Van Nostrand.
- BASTIAT, F. (1845). *Economic Harmonies*, trans. W. Hayden Boyers, New York: Van Nostrand
- BECKER, G. (1995). "It's simple: Hike the minimum wage, and you put people out of work." *Business Week*. March 6. p. 22.

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wiring, a la Darwin in this case, inclines people toward economic liberalism and free enterprise economics. We of course, oppose this point of view, and note that Arnhart (2009) recognizes uncertainty. We owe these citations to William Ruger.



- BEDNARIK, R.G. (1992). Paleoart and archaeological myths. *Cambridge Archaeological Journal* 2(1):27-43.
- BELTRÁN, A. and ROYO, J. (2008). La Prehistoria en la comarca de Andorra-Sierra de Arcos. In J. Alquézar and P. Rújula (eds.), *Comarca de Andorra-Sierra de Arcos*, pp. 73–81. Gobierno de Aragón, Zaragoza.
- BERNINGER, V. and RICHARDS, T. (2010). Inter-relationships among behavioral markers, genes, brain and treatment in dyslexia and dysgraphia. *Future Neurology* 5(4): 597–617. DOI: [10.2217/fnl.10.22](https://doi.org/10.2217/fnl.10.22)
- BOEHM, C. (1999). *Hierarchy in the Forest: The Evolution of Egalitarian Behavior*. Harvard University Press [pp 198-208].
- BONNIE, K.E., HORNER, V., WHITEN, A., and de WAAL, F.M.B. (2007). Spread of arbitrary conventions among chimpanzees: a controlled experiment. *Proceedings of the Royal Society B: Biological Sciences*, 274(1608), 367-372. DOI: [10.1098/rspb.2006.3733](https://doi.org/10.1098/rspb.2006.3733)
- BROSNAN, S.F. and de WAAL, F.M.B. (2003). Monkeys reject unequal pay. *Nature*, 425(6955): 297-299. DOI: [10.1038/nature01963](https://doi.org/10.1038/nature01963)
- BROSNAN, S.F. and De WAAL, F.M.B. (2005). Responses to a simple barter task in chimpanzees, *Pan troglodytes*. *Primates* 46: 173-182. DOI: [10.1007/s10329-005-0125-0](https://doi.org/10.1007/s10329-005-0125-0)
- BROWN, D.E. (1991). *Human Universals*. New York: McGraw-Hill
- BURDUKIEWICS, J.M. (2009). “Further Research on Amber in Paleolithic Archeology” in Burdukiewics, J. M.; Cyrek, K.; Dyczek, P. and Szymczak, K. (eds) *Understanding the Past: Papers offered to Stefan K. Koslowski*, University of Warsaw.
- BURKHAUSER, R.V., COUCH, K.A., WITTENBURG, D. (1996). “Who Gets What From Minimum Wage Hikes: A Replication and Re-estimation of Card and Krueger.” *Industrial and Labor Relations Review*, 49(3): 547-552.
- CANTOR, P. 2013. *Invisible Hand in Popular Culture: Liberty vs. Authority in American Film and TV*. University Press of Kentucky.
- CHEN, M.K., LAKSHMINARAYANAN, V., and SANTOS, L.R. (2006). How basic are behavioral biases. Evidence from capuchin monkey trading behavior. *Journal of Political Economy* 114(3): 517-537. DOI: [10.1086/503550](https://doi.org/10.1086/503550)
- CHOMSKY, N. (1975). *Reflections on language*. New York: Pantheon.
- CNRS. (2007, June 18). Discovery of The Oldest Adornments In The World. *Science-Daily*. Retrieved October 8, 2014 from [www.sciencedaily.com/releases/2007/06/070618091210.htm](http://www.sciencedaily.com/releases/2007/06/070618091210.htm).
- COOPER, H.M. (1948). Examples of native material culture from South Australia. *South Australian Naturalist* 25(1):1-7.
- DAWKINS, R. (1986). *The Blind Watchmaker*. NY: Norton.
- DAWKINS, R. (1976/1989). *The Selfish Gene*, New York: Oxford University Press.

- DAWKINS, R. (1995). *River Out of Eden: A Darwinian View of Life*, NY: Basic Books
- DEERE, D., MURPHY, K.M., WELCH, F. (1995). Employment and the 1990-91 Minimum-Wage Hike. *American Economic Review*. 85, no. 2, May, pp. 232-237.
- DEGLER, C.N. (1991). *In search of human nature: The decline and revival of Darwinism in American social thought*. New York: Oxford University Press.
- DENAULT, L.K. and MCFARLANE, D.A. (1995). Reciprocal altruism between male vampire bats, *Desmohs votundus*. *Animal Behavior* 49, 855-856; DOI: [10.1016/0003-3472\(95\)80220-7](https://doi.org/10.1016/0003-3472(95)80220-7)
- DUSEK, V. (Undated). "Evolutionary psychology sanitized: the evolutionary psychology and genic selectionism debates." <http://tomweston.net/dusek.htm>.
- ECKHARDT, R.B. (2000) *Human Paleobiology*. Cambridge University Press.
- EPLEY, S.W. and ROSENBAUM, M.E. (1975). "Cooperative behavior in rats: Effect on extinction of shock onset conditions during acquisition." *Journal of Personality and Social Psychology*, 31(3): 453-458. DOI: [10.1037/h0076414](https://doi.org/10.1037/h0076414)
- FIELD, A.J. (2004). *Altruistically Inclined: The Behavioral Sciences, Evolutionary Theory, and the Origins of Reciprocity: An exploration of the role of altruism in the discipline of economics*. University of Michigan Press
- FOSTER, P. (2014). "Klein vs. Steyn." *The Financial Post*. October, 22, p. FP13; <http://business.financialpost.com/2014/10/21/peter-foster-naomi-klein-vs-mark-steyn/>.
- FRANK, R.H. (1988). *Passion within Reason: The Strategic Role of the Emotions*, NY: Norton.
- FRANK, M.C., EVERETT, D.L., FEDORENKO, E., and GIBSON, E. (2008). Number as a cognitive technology: Evidence from Pirahã language and cognition. *Cognition*, 108(3), 819-824. DOI: [10.1016/j.cognition.2008.04.007](https://doi.org/10.1016/j.cognition.2008.04.007)
- FRIEDMAN, D. (1979). Private Creation and Enforcement of Law - A Historical Case, *Journal of Legal Studies*, 8(2): 399 - 415. DOI: [10.1086/467615](https://doi.org/10.1086/467615)
- FRIEDMAN, M. (2008). "We Have Socialism, Q.E.D." *New York Times*, October 18; [http://www.nytimes.com/2008/10/19/opinion/19opclassic.html?\\_r=0](http://www.nytimes.com/2008/10/19/opinion/19opclassic.html?_r=0)
- GALIK, K., SENUT, B., PICKFORD, M., GOMMERY, D., TREIL, J., KUPERA-VAGE, A., and ECKHARDT, R.B. (2004). External and internal morphology of the BAR 1002'00 *Orrorin tugenensis* femur. *Science* 305:1450-1453.
- GALLAWAY, L. and ADIE, D. (1995). Review of Card and Krueger's *Myth and Measurement: The New Economics of the Minimum Wage*, *Cato Journal*, 15(1): 137-140.
- GHISELIN, M.T. (1978). The Economy of the Body. *American Economic Review*. May, 68(2):233-237/.
- GHISELIN, M.T. (1987a). Bioeconomics and the Metaphysics of Selection, *Journal of Social and Biological Structures*. October, 10(4):361-369, 376.

- GHISELIN, M.T. (1987b). 'Principles and Prospects for General Economy', and 'The Economics of Scientific Discovery'. In Gerard Radnitzky and Peter Berkholtz, eds., *Economic Imperialism: The Economic Method Applied Outside the Field of Economics*, pp. 21-31, 271-282. New York: Paragon House.
- GRIFFITHS, P.E. (Undated). "Evolutionary Psychology: History and Current Status." *The Philosophy of Science: An Encyclopedia*, Sahotra Sarkar (Ed.), New York: Routledge.
- GWARTNEY, J., LAWSON, R.W. and BLOCK, W.E. (1996). *Economic Freedom of the World, 1975-1995*; Vancouver, B.C. Canada: the Fraser Institute.
- HART, B.L. and HART, L.A. (1992). Reciprocal allogrooming in impala, *Aepyceros melampus*. *Animal Behavior*, 44(6): 1073-1083. DOI: [10.1016/S0003-3472\(05\)80319-7](https://doi.org/10.1016/S0003-3472(05)80319-7)
- HAYEK, F.A. (1931). *Prices and Production*, London: Routledge.
- HAYEK, F.A. (1988). *The Fatal Conceit: The Errors of Socialism*, Chicago, The University of Chicago Press.
- HAZLITT, H. (2008) [1946]. *Economics in One Lesson*. Auburn, AL: Mises Institute; [http://mises.org/books/economics\\_in\\_one\\_lesson\\_hazlitt.pdf](http://mises.org/books/economics_in_one_lesson_hazlitt.pdf).
- HENAHAN, S. (2002). "Art Prehistory" in <http://www.accessexcellence.org/WN/SU/caveart.php>.
- HORTON, N. (2010). Evolutionary psychology vs Evolutionary Psychology. [http://www.sapiengames.com/2010/08/03/Evolutionary\\_psychology-vs-evolutionary-psychology/](http://www.sapiengames.com/2010/08/03/Evolutionary_psychology-vs-evolutionary-psychology/)
- HUGHES, J.R.T. (1977). *The Governmental Habit: Economic Controls from Colonial Times to the Present*. New York: Basic Books.
- JARVIS, J.U.M. (1978). Energetics of survival in *Heterocephalus glaber* (Ruppell), the naked mole rat (Rodentia: Bathyergidae). *Bulletin of the Carnegie Museum of Natural History* 6, 81-87.
- KOLKO, G. (1963). *Triumph of Conservatism*, Chicago: Quadrangle Books.
- KREBS, J. R. and DAVIES, N. B. (1978). *Behavioural Ecology: An Evolutionary Approach*. Oxford: Blackwell Scientific Publications.
- KUHN, S. and STINER, M. (2006). What's a mother to do? The division of labor among Neanderthals and modern humans in Eurasia. *Current Anthropology*, 47(6): 953-980. DOI: [10.1086/507197](https://doi.org/10.1086/507197)
- KUHN, S.L., STINER, M.C., REESE, D.S. and GÜLEÇ, E., (2001). Ornaments of the earliest Upper Paleolithic: New insights from the Levant. *Proceedings of the National Academy of Sciences*, 98(13), pp.7641-7646.
- LANDSBURG, S.E. (2004). The sin of wages; the real reason to oppose the minimum wage. *Slate*. July 9. <http://slate.msn.com/id/2103486>.
- LICHTER, S. ROBERT, ROTHMAN, S., and LICHTER, L. (1986). *The Media Elite: America's New Power-brokers*. Bethesda, MD: Adler & Adler.

- LICHTER, S.R., LICHTER, L.S., and ROTHMAN, S. (1991). *Watching America: What Television Tells Us About Our Lives*; Simon & Schuster
- LINCOLN, A.E. and ALLEN, M.P. (2004). Double Jeopardy in Hollywood: Age and Gender in the Careers of Film Actors, 1926-1999. *Sociological Forum*, 19(4): 611-631. DOI: [10.1007/s11206-004-0698-1](https://doi.org/10.1007/s11206-004-0698-1)
- LONG, R.T. (1994). The Decline and Fall of Private Law in Iceland, <http://libertariannation.org/a/f1311.html>.
- ŁOPUCH, S. and POPIK, P. (2011). Cooperative behavior of laboratory rats (*Rattus norvegicus*) in an instrumental task. *Journal of Comparative Psychology*, Vol. 125(2), May, 250-253. DOI: [10.1037/a0021532](https://doi.org/10.1037/a0021532)
- LORDKIPANIDZE, D., DE LEÓN, M.S.P., MARGVELASHVILI, A., RAK, Y., RIGHTMIRE, G.P., VEKUA, A., and ZOLLIKOFER, C. P. (2013). A complete skull from Dmanisi, Georgia, and the evolutionary biology of early Homo. *Science*, 342(6156), 326-331. DOI: [10.1126/science.1238484](https://doi.org/10.1126/science.1238484)
- MALINOWSKI, B. (1922). *Argonauts of the Western Pacific*, London: Routledge and Kegan Paul.
- MCBREARTY, S. and BROOKS, A.S. (2000). The revolution that wasn't: a new interpretation of the origin of modern human behavior. *Journal of Human Evolution* 39:453-463. DOI: [10.1006/jhev.2000.0435](https://doi.org/10.1006/jhev.2000.0435)
- MCGREW, W.C., and TUTIN, C.E. (1978). Evidence for a social custom in wild chimpanzees? *Man*, 234-251. DOI: [10.2307/2800247](https://doi.org/10.2307/2800247)
- MCNAB, B.K. (1973). Energetics and the distribution of vampires. *J. Mammal.* 54, 131-144. DOI: [10.2307/1378876](https://doi.org/10.2307/1378876)
- MENGER, C. (1950). *Principles of Economics*, editors and translators, James Dingwall and Bert F. Hoselitz, Glencoe, IL: Free Press.
- MIDGLEY, M. (1994). *The Ethical Primate*. Routledge: New York.
- MISES, L. von. [1912] 1953. *The Theory of Money and Credit* [originally published in German in 1912]. New Haven, CT: Yale University Press.
- MUNGER, M. (2007). "They Clapped: Can Price-Gouging Laws Prohibit Scarcity?" July 8; <http://www.econlib.org/library/Columns/y2007/Mungergouging.html>
- MURAVCHIK, J. (1999), The rise and fall of socialism. AEI Bradley Lecture Series. <http://www.aei.org/publication/the-rise-and-fall-of-socialism/>.
- MURAVCHIK, J. (2003). *Heaven on Earth: The Rise and Fall of Socialism*. Encounter Books.
- MURPHY, R.P. (2011). "Have Anthropologists Overturned Menger?" September 1; <http://mises.org/daily/5598/Have-Anthropologists-Overturned-Menger>.
- NEUMARK, D. and WASCHER, W. (1992). Employment Effects of Minimum and Subminimum Wages: Panel Data on State Minimum Wage Laws. *Industrial and Labor Relations Review* 46 (October), pp. 55-81. DOI: [10.1177/001979399204600105](https://doi.org/10.1177/001979399204600105)

NEUMARK, D. and WASCHER, W. (1995). Minimum wage effects on employment and school enrollment. *Journal of Business Economics and Statistics*. 13(2): 199-207.

NEW YORK TIMES, (2002). When Humans Became Human. Story by John Noble Wilford. Feb. 26, 2002. Available online at: <http://www.nytimes.com/2002/02/26/science/when-humans-became-human.html?pagewanted=all&src=pm>

OFEK, H. (2001). *Second Nature: Economic Origins of Human Evolution*. Cambridge University Press.

PACKER, C. (1977). "Reciprocal altruism in *Papio Anubis*." *Nature* 265:441- 443.

PARK, S. (1991). Development of social structure in a captive colony of the common vampire bat, *Desmodus rotundus*. *Ethology*, 89, 335-341. DOI: [10.1111/j.1439-0310.1991.tb00378.x](https://doi.org/10.1111/j.1439-0310.1991.tb00378.x)

PEDEN, J.R. (1977). Property Rights in Celtic Irish Law, *Journal of Libertarian Studies* 1(2): 81-95.

PINKER, S. (1994). *The Language Instinct: How the mind creates language*. New York: Harper-Collins.

PINKER, S. (1997). *How the Mind Works*. New York: Norton.

PINKER, S. (2002). *The Blank Slate: The Modern Denial of Human Nature*. New York: Viking.

PRÜFER, K., MUNCH, K., HELLMANN, I., AKAGI, K., MILLER, J.R., WALENZ, B., ... and PÅÅBO, S. (2012). The bonobo genome compared with the chimpanzee and human genomes. *Nature* 486(7404): 527. DOI: [10.1038/nature11128](https://doi.org/10.1038/nature11128)

RADFORD, R.A. (1945). The Economic Organization of a P.O.W. Camp. *Economica*, New Series, 12(48): 189-201. DOI: [10.2307/2550133](https://doi.org/10.2307/2550133)

REED, F. (2017). "The Military Instinct: The Human Race as Feral Dogs." October 20, <https://www.lewrockwell.com/2017/10/fred-reed/the-military-instinct-the-human-race-as-feral-dogs/>

RIDLEY, M. (1986). *The problems of evolution*, New York: Oxford University Press.

RIDLEY, M. (1993). *The Red Queen: Sex and the evolution of human nature*, NY: MacMillan.

ROBINSON, S. and HUBER, R.J. (1974). Animal altruism and co-operation: a selected bibliography. *Psychological Reports*, 35(3): 1171-1174. DOI: [10.2466/pr0.1974.35.3.1171](https://doi.org/10.2466/pr0.1974.35.3.1171)

ROOD, J.P. (1983). The social system of the dwarf mongoose. *Advances in the Study of Mammalian Behavior*, 454-488.

ROTHMAN, S., NEVITTE, N., and LICHTER, S.R. (2005). Politics and Professional Advancement. *Academic Questions*, 18(2): 71–84. DOI: [10.1007/s12129-005-1008-y](https://doi.org/10.1007/s12129-005-1008-y)

SAHLINS, M. (1968). Notes on the Original Affluent Society, in *Man the Hunter*. R.B. Lee and I. DeVore (New York: Aldine Publishing Company) pp. 85-89.

- SAHLINS, M. (1972). *Stone Age Economics*. Chicago, Aldine-Atherton.
- SAHLINS, M. (2008). *The Western Illusion of Human Nature*. Chicago: Prickly Paradigm Press.
- SCHMANDT-BESSERAT, D. (1977). *An archaic recording system and the origin of writing* (pp. 1-28). Undena Publications.
- SCHMANDT-BESSERAT, D. (1982). How writing came about. *Zeitschrift für Papyrologie und Epigraphik*: 1-5.
- SCHMANDT-BESSERAT, D. (1992). *Before Writing Vol. 1: From Counting to Cuneiform*. Austin Texas: University of Texas Press.
- SEYFARTH, R.M. and CHENEY, D.L. (1984). Grooming, alliances and reciprocal altruism in vervet monkeys. *Nature* 308(5959): 541–543. DOI: [10.1038/308541a0](https://doi.org/10.1038/308541a0)
- SIMOONS, F.J., (1970). Primary adult lactose intolerance and the milking habit: a problem in biologic and cultural interrelations. *The American Journal of Digestive Diseases*, 15(8), pp.695-710. DOI: [10.1007/BF02235991](https://doi.org/10.1007/BF02235991)
- SMITH, A. [1776] (1979). *An Inquiry into the Nature and Causes of the Wealth of Nations*, Indianapolis, IN: Liberty Fund.
- SOLVASON, B., RUNOLFSSON, T. (1992). Ordered anarchy: Evolution of the decentralized legal order in the Icelandic commonwealth. *Icelandic Economic Papers*, 17.
- SOWELL, T. (1995). "Repealing the Law of Gravity," *Forbes*, May 22; p. 82.
- SZABO, N. (2002). "The Origins of Money." *repec:wpa:wuwphe:0211005*.
- TERRADAS, X., GRATUZE, B., BOSCH, J., ENRICH, R., ESTEVE, X., OMS, F.X. and RIBÉ, G. (2014). Neolithic diffusion of obsidian in the western Mediterranean: new data from Iberia. *Journal of Archaeological Science* 41: 69–78. DOI: [10.1016/j.jas.2013.07.023](https://doi.org/10.1016/j.jas.2013.07.023)
- THOMPSON, J.R. (2014). *Rock Art Research*, 31(2):131-156.
- TRIVERS, R.L.(1971). The evolution of reciprocal altruism.Q. Rev. Biol., 46, 35-37. DOI: [10.1086/406755](https://doi.org/10.1086/406755)
- TRIVERS, R.L. (1972). Parental investment and sexual selection. *Sexual Selection and the Descent of Man*, ed. B. Campbell. Chicago: Aldine. Pp. 136-179.
- TRIVERS, R.L. (1985). *Social Evolution*, Reading, MA: Benjamin/Cummings.
- VARGHA-KHADEM F., WATKINS K., ALCOCK K., FLETCHER, P., and PASSINGHAM, R. (1995). Praxic and nonverbal cognitive deficits in a large family with a genetically transmitted speech and language disorder. *Proceedings of the National Academy of Sciences U.S.A.* 92 (3): 930–933.
- WEBSTER, G.D. (2007). "What's in a Name: Is 'Evolutionary Psychology' Eclipsing 'Evolutionary psychology' in the Scientific Literature?" *Evolutionary Psychology*; 5(4): 683-695.
- WELLER, O. and FÍGULS, A. (2008). Première extraction de sel minier: place et rôle du sel de Cardona dans les échanges communautaires du Néolithique moyen catalan. In

M. S. Hernández Pérez, J. A. Soler DÍAZ and LÓPEZ PADILLA, J.A. (eds.), *Actas del IV congreso del neolitico peninsular. Vol. I*, pp. 353–360. Diputación Provincial de Alicante, Museo Arqueológico de Alicante, Alicante.

WESTERGAARD, G.C., EVANS, T.A. and HOWELL, S. (2007). Token mediated tool exchange between tufted capuchin monkeys. *Animal Cognition*, 10: 407-414. DOI: [10.1007/s10071-007-0072-9](https://doi.org/10.1007/s10071-007-0072-9)

WHITEN, A., GOODALL, J., MCGREW, W. C., NISHIDA, T., REYNOLDS, V., SUGIYAMA, Y., ... and BOESCH, C. (1999). Cultures in chimpanzees. *Nature*, 399(6737): 682-685. DOI: [10.1038/21415](https://doi.org/10.1038/21415)

WHITEN, A., HORNER, V., and de WAAL, F.B.M. (2005). Conformity to cultural norms of tool use in chimpanzees," *Nature*, 437(7059): 737-740. DOI: [10.1038/nature04047](https://doi.org/10.1038/nature04047)

WILSON, E.O. (1975). *Evolutionary psychology*, Cambridge, MA: Harvard University Press.