

# The Intersection of Evolutionary Principles, Human Behavior and Environmental Sustainability

Sarah M. Johnson<sup>1</sup>  
Marc E. Pratarelli<sup>2</sup>

<sup>1</sup>Department of Sociology, University of Colorado at Colorado Springs

<sup>2</sup>Department of Psychology, Colorado State University-Pueblo

---

## ABSTRACT

Some environmentalist writers suggest that to achieve environmental sustainability people will need to reframe their value judgments about nature in nondualist terms. Nondualist ideals hold that there is no separation or distinction between ‘*man and nature*’. In opposition to evolutionary psychology principles, these writers also subscribe either implicitly or explicitly to the *noble savage* philosophical view as well as Lockean *blank slate* assumptions about the mind and behavior. Thus, they submit to the denial of basic human nature. In this paper, we argue that changing people’s values and attitudes about nature and our place in it will be difficult because they are necessarily economic rather than aesthetic or emotional connections to the land. In contrast, an evolutionary approach to understanding human consumptive behavior is congruent with climate-change and earth sciences evidence as well as being an empirically informed approach to consumer education in the future. Also missing from environmentalist writers’ understanding is that our Pleistocene brain was adapted for a different time and place. The reality is there were neither 6.8 billion competing consumers nor the culture of technology that today accelerates the destruction and depletion of finite natural resources.

## KEYWORDS

Noble savage, values, nondualism, environmentalism, adaptation

---

## INTRODUCTION

One popular theme among many environmentalist writers (cf., Bender, 2003; Capra, 1996; Leopold, 1966; Naess, 1973; Orr, 1992) is to argue that reframing our value judgments about nature in ecological (i.e., eco-centric, nondualist) terms is

---

AUTHOR NOTE: Please direct correspondence to: Sarah M. Johnson, 8588 Pine Drive, Beulah, Colorado 81023. Email: [sjohnso7@uccs.edu](mailto:sjohnso7@uccs.edu).

---

*EvoS Journal: The Journal of the Evolutionary Studies Consortium*

ISSN: 1944-1932 - <http://evostudies.org/evos-journal>

2011, Volume 3(2), pp. 1-15.

what will ultimately be needed to achieve environmental sustainability.<sup>1</sup> However, most of these writers and many others across various genres relied on arguments and assumptions about human nature that were derived from the *noble savage* philosophical view, which is inconsistent with basic evolutionary principles. People today are driven by the same naturally-selected survival motives that drove *Homo sapiens* of the recent past (150,000 years ago to the present). Support for this assumption comes from a body of evidence in physical anthropology and human evolutionary psychology. From the skeletal endocast evidence there is general agreement amongst these scientists that the most recent evolution giving rise to modern humans was somewhere in the range of 150,000 to 175,000 years ago (Holloway et al., 2004; Lieberman, McBratney, & Krovitz, 2002). Moreover, archaeological evidence similarly indicates that human predispositions toward the acquisition of resources and consumption and survival motives in general have not changed except in cultural or memetic ways (Chiarelli, 2003).

Climate-change science is primarily concerned with environmental *effects*, and not surprisingly most researchers and environmentalists agree that humans are the principal causal agents. Among environmental psychologists and ethicists there is similar agreement that the single most important factor in reducing human overconsumption is to change decision-making, values and attitudes before behaviors can be addressed. In this paper we will argue that changing people's long-term values about nature, how to live without overexploiting it, and more generally our place within it will be difficult because those values are predominantly economic. As a living organism that requires natural resources to extract the energy to fuel survival, human beings would necessarily have an economic relationship with nature for purely biological and evolutionary reasons. The working logic for a biologically-based value system regarding nature turns on the notion that humans—like all other species—live and exist in a relative present and thus their focus is on short-term gain and success. Despite the unpopularity among environmentalist writers that a short-term focus is Hobbesian and “brutish”, there is no way around the reality that a short-term focus ensures an organism will live another day. Since a long-term focus (i.e., in terms of centuries, millennia and geologic time) requires an individual to plan well beyond its own lifetime, it is both counterintuitive and has the effect of going against our immediate biological motives.

Our modern Pleistocene brain was adapted for a different time and place (Cosmides & Tooby, 1992). The pre-Neolithic environment of evolutionary adaptation (EEA) did not feature the collective pressures of 6.8 billion consumers as we have presently nor the culture and technology that today accelerate the destruction and depletion of limited natural resources (Rees, 2002). Therefore, human values concerning nature and its underlying anthropocentrism were dictated by the human predisposition toward a short-term focus rather than a long-term concern for the health and integrity of the ecosystem. Making it to the end of the

---

<sup>1</sup>The Bruntland Commission in 1983 developed the following often cited working definition for *sustainability* as it concerns humans and their environment: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." It is worth mentioning that while many academic and nonacademic writers use this definition, debate over its accuracy is ongoing.

day, the week or a season occupied the concerns of early hominids as it does presently in the few remaining nomadic societies (Chiarelli, 2003). There was no planning for retirement, college educations, summer vacations, etc. The concept of *future*, especially in the absence of complex language, would have been limited to concrete epochs that everyone was familiar with (Buss, 1995; Pratarelli, 2003; Shackelford, 2006). It is intuitively reasonable to conclude from most anyone's observations who lives in a modern techno-industrial society, especially those of Western-developed countries with the largest carbon footprints, that little has changed in terms of our short-term outlook.

An important qualification, however, concerns the degree to which what future outlook our human ancestors may have had, allowed them either to overexploit or protect and conserve their natural resources. Presently, a few Native American cultures continue the policy of taking into account the impact of any tribal decision that concerns resources or community for seven generations into the future (Gedicks, 1993). This practice is attributed to the Iroquois Nation, but has been adopted by other tribal nations as well. Similarly, Renfrew (2009) has shown that there is considerable prehistoric evidence of long term planning in the building of settlements and communities, religious ritual, and other social institutions. There is no question that our ancestors had some capacity to make plans that extended beyond their own lifetimes. This psychological process clearly distinguishes *Homo sapiens* from all other apes and primates more generally. Nonetheless, when considering the impact of consumptive human activity that has effects lasting millions of years (e.g., depletion of oil reserves that took millions of years to create), or carbon emissions whose impact on flora and fauna are measured over millennia, it is clear that no humans, past or present, have demonstrated the capacity for such long range planning.

To cope with the reality of having a short-term focus in modern humans, one popular approach advanced by Naess (1973) and more recently Bender (2003) is to encourage people everywhere to adopt an eco-centric nondualist or Buddhist-like philosophy. Such philosophies tend to deemphasize materialism and instead practice nonmaterialism in an effort to reduce our collective environmental impact. Whether this philosophical approach and belief system is practical or viable in light of evolutionary principles is the deeper objective of this paper.

### *The Noble Savage Syndrome*

European settlers, at first meeting the Native Americans, wrote beautiful accounts of their passiveness, kindness, and generosity. Thus, the concept of the *noble savage* was born. It continued to flourish through the philosophical writings of Jean-Jacques Rousseau (1775/1994). For example, he states: "The example of the savages, most of whom have been found in this condition, seems to confirm that mankind was formed ever to remain in it, that this condition is the real youth of the world, and that all ulterior improvements have been so many steps, in appearance towards the perfection of individuals, but in fact towards the deceptions of the species" (p.61).

The notion that humanity was once a peaceable species that lived as one with the earth and each other, and that the source of today's social ills like sexism,

racism, violence and rape of women and the earth came about through modern civilization is patently false and unsupportable. There exists no testable evidence for such a claim. First, the idea that there was no civilization before White civilization stems from European-colonial arrogance. Native Americans had religion, tools, power structures, war; everything our modern civilization has today (Lewis, 1995). The popular notion proffered by Bender (2003) that “tribal people exhibited cooperation, sharing, good humor, gratitude, humility, modesty, generosity, cheerful tolerance of discomfort, unstinting work and play, physical prowess, appreciation of life’s fragility, appropriate boldness, hunting skill, domestic skill, trans-generational and trans-species kinship awareness, love of children, respect of elders, acceptance of group responsibility, conflict avoidance, respect for nature, etc....” (p. 108) is a romanticized depiction of tribal life and a reasonable illustration of how the noble savage lives on in contemporary academic and nonacademic writing. In contrast, evolutionary anthropologists and psychologists have offered a very different account of traditional life in the wild as the following narrative by Pinker (2002) demonstrates.

To begin with, the stories of tribes out there somewhere who have never heard of violence turn out to be urban legends. Margaret Mead’s description of peace-loving New Guineans and sexually nonchalant Samoans were based on perfunctory research and turned out to be almost perversely wrong. As the anthropologist Derek Freeman later documented, Samoans may beat or kill their daughters if they are not virgins on their wedding night, a young man who cannot find a virgin may rape one to exhort her into eloping, and the family of a cuckolded husband may attack and kill the adulterer. The !Kung San of the Kalahari Desert had been described by Elizabeth Marshall Thomas as “the harmless people” in a book with that title. But as soon as anthropologists camped out long enough to accumulate data, they discovered that the !Kung San have a murder rate higher than that of American inner cities. They learned as well that a group of the San had recently avenged a murder by sneaking into the killer’s group and killing every man, woman, and child as they slept (p. 56).

Additionally, several tribal societies are known to have participated in cannibalism and ritualized human sacrifices. In the case of early Aztec societies, violence and human sacrifice existed well before they had first contact with Europeans (Harner, 1977). In the face of such evidence, one could reasonably argue that with the emergence of industrialization, women have actually experienced more equality and opportunity than at any time in human history (Kerber, 1986). The industrial revolution and the democratic movements eventually brought inclusion of women and other marginalized peoples into mainstream culture and facilitated their survival and improved living standards. Conditions may still not be perfect according to mainstream feminists, but there is no denying that they are improved. The aid of a tribe or a mate has ceased to be absolutely necessary and therefore women have the freedom to leave when men become abusive or otherwise unpleasant to be around. In most tribal societies this option was

unavailable, leaving women susceptible to a plethora of cruel treatments as the above quote clearly illustrates. As Kerber (1986) notes, in the absence of modern law, a woman could not “spend her own money, sell her stocks or slaves, and appropriate her clothing and jewelry. He [her husband] gained managerial rights to her lands, houses, and tenements, and decided if land was to be farmed by the family or leased. He also controlled the rents and profits from all real estate” (p. 41).

The notion that indigenous societies of yesterday and today are far less violent than our own is also empirically incorrect. As Pinker (2002) points out, “anthropologists and historians have also been counting bodies. Many intellectuals tout the small numbers of battlefield casualties in pre-state societies as evidence that primitive warfare is largely ritualistic. They do not notice that two deaths in a band of fifty people is the equivalent of ten million deaths in a country the size of the United States” (p. 56).

Part of the image of the noble savage portrays a people at one with the earth, living in harmony with nature in a way industrialized countries have never known. The assumption is often made that we can learn from these non-industrialized cultures because they were somehow different or special (cf., Bender, 2003; Holthaus, 2008; Jacobs, 2009). Yet, a closer examination reveals there is a problem with this arbitrary assumption when viewed through the lens of an evolutionary-biological model. Ancestral tribal cultures (somewhat like the remaining indigenous societies) did not have the technological capabilities that we have presently in modern societies (thus, we see infant mortality rates as high as 80%, four in five children who survive childbirth dying before the age of five, and one in six women dying during childbirth; extinction of 50% of the large land mammals on the North American continent, etc., Crichton, 2003).

The Noble Savage conclusion that indigenous peoples have a morally superior attitude toward nature is purely a *non sequitur*. Any comparison between modern society and theirs is biased and arbitrary at best; the reason being tribal societies had not yet acquired the technological knowledge and the capacity to harm nature on a grand scale as we do today. Had the indigenous tribal societies acquired the tools to create a civilization like America and other Western developed nations and then rejected it out of a love for nature, such a culture might have something to teach us. However unfortunate, that is not the case. In addition, it tells us little to nothing about how to make the overwhelming majority of 6.8 billion global citizens living today give up the opportunity and dream of living as we do in the Westernized societies.<sup>2</sup> Resisting a lifestyle such as we have here in America is difficult for anyone. For example, whether or not it was forced upon them, Native Americans, and many other tribal societies have not rejected these technological advances when given the opportunity. Native Americans have historically behaved like their White foreign invaders acquiring and implementing new technologies and enterprises (e.g., oil and gas refineries, uranium mining, gambling casinos) when

---

<sup>2</sup> Rees (2010) has calculated that Americans and Canadians require approximately 25 acres of land per person to support our present lifestyle. In contrast, the citizens of the poorest countries survive on as little as .5 acres. By dividing the total estimated amount of arable land by 6.8 billion (the current global population), a perfectly equitable redistribution of land per person would be in the range of a mere 2-3 acres per person.

the opportunities have presented themselves (cf., Lewis, 1996; Shepard, 2010; Vinje, 1996). Shepard immediately honed in on the survival value issue when he stated that “given the traditionally social and economic conditions on reservations, it is not surprising that many Native Americans embrace the gaming industry as a source of income” (2010, p.262).

It is vital that we have alternative models for a future environmentally sustainable civilization, but to look toward tribal societies is not only misguided, it runs the risk of oversimplifying a very complex set of circumstances. Globalization, free trade, modern communications and travel, medical care and biotechnologies, home conveniences and many other technological innovations make it increasingly unlikely that humans will be able to give up or reduce their collective ecological footprint in the foreseeable future. Nonetheless, this is what popular environmentalists like the former Vice-President and Nobel Prize winner Albert Gore and much of the climate-change scientific community is asking humans to do. Moreover, international politics and the rule of law, and still other factors complicate the development of an environmental ethic that everyone in both developing and developed nations can agree upon. The recent failure of the Copenhagen Climate Conference demonstrates the complexity of negotiating a global solution to the problem of human overconsumption and waste (Vidal, Stratton, & Goldenberg, 2009). The solution will not be as easy as eliminating all our present day technologies or reinventing them in light of new green economic standards. There are several reasons why this is not the case.

Modern technology requires far less personal energy expenditure from an individual, e.g., it takes much less energy to press the speed-dial button on one’s cell phone, than to prepare your horse and buggy and gallop several miles to communicate with a friend. Every society, like individual organisms, works to expend the least amount of energy while achieving the highest level of prosperity it can (Pratarelli, 2003; Wilson, 2007). Evidence for this condition can be seen in species as diverse as social insects or humans (Wilson, 2000). Simple behaviors can best demonstrate this phenomenon as in the case of insects that huddle together to conserve heat energy or their ability to divide the labor of constructing and maintaining a hive, while others collect food or defend the group (Goodenough, McGuire, & Jacob, 2009), all of which are characteristics of modern humans whether they are organizing their communities or two roommates who share expenses to save money. This only makes intuitive and economic sense; thus, more energy-intensive living costs more by requiring us to secure more resources. In the wild, animals hunt the young and the old of a herd not because they are somehow altruistic, but because it requires the least amount of energy to accomplish (Marc Bekoff, personal communication, 2002). This is also basic biology and physics at work. It is an adaptive quality that all mammals that survived to this point must possess lest they overextend themselves. This is precisely why a “culture of extinction”, one characterized by exploitation and excess, is such a problem (Bender, 2003), and why all societies seem to want to be part of it (with the exception of a few scattered here and there like celibate monks, but they are by no means the majority; in evolutionary theory variations always exist, but they are exceptions, not the rule.).

The more pressing dilemma we face is that the human mind evolved by concentrating on short-term needs. This is why at a time when environmentalists are calling for a change in human consciousness that focuses on the long term, the biological reality is that our behavior is rarely if ever motivated by a concern for the distant future, for unborn generations, or for the integrity of the earth. One might say that our brains are simply not big or complex enough to accommodate that kind of processing involving the abstract notion of geologic time. During the natural history of our species, an individual's priority would have been to survive to the next day, week or season; had it been otherwise we would not have come this far as a family, genus and ultimately our modern *H. sapiens-sapiens* species. On that subject, Potter writes:

It is my thesis here that in pursuing perfect adaptation the evolutionary process has built into each member of the human species an instinct for short-term gains so strong that no prescient individual, committee, religion, or private organization has so far been able to conceive or effect a cultural milieu that could adequately balance the short-term instincts of human individuals with the long-range needs of the species. (Potter, 1995, p. 107).

The “culture of extinction” is indeed dangerous, though it is important to recognize that it began and is perpetuated by us. It is our mind such as it was evolved, our drives and our capabilities that create culture, it is not the other way round. For example, the modern understanding in much of the behavioral and neurosciences is that our species—like others ranging from rodents, wild or domestic dogs and cats, and all other primates—comes pre-packaged with cognitive mechanisms that help us interpret our surroundings and respond in adaptive ways that improve the odds of winning the reproduction game. This is also the essential assumption behind the adapted mind and the development of human evolutionary psychology as a discipline (Barkow, Cosmides & Tooby, 1992). One prominent way that we adapt is to create cultures that are suited to certain environmental conditions and not others. If particular behaviors and ways of thinking in any given culture are culturally or mimetically successful, then the motives that underlie those cultural adaptations are themselves selected-for. Benjamin Whorf explained why the linguistic (cultural) repertoire of Africans living in forests has to differ from the repertoire of Alaskan Inuits who lack forests and are surrounded by ice (Carroll, 1956). His linguistic relativity hypothesis acknowledged that a universal-biological aspect of communication existed and that culture and the broader environment shaped its specific local manifestation so that language continued to be adaptive. Culture, therefore, is driven and created by our biological drives (like the brain-based need to communicate).

In addition, were it possible to thwart our instincts to change everything self-destructive about our culture, the chances are that someone's greed or (biological drive to survive) will recreate the entire society once more as it was. Garrett Hardin (1968), in one of the most famous and most quoted papers ever in the journal *Science*, referred to non-cooperators as “defectors” or “free-riders” (p. 1244). As he noted, these are a substantial proportion of all populations, and they do not react

positively to human-made laws, social pressure or coercion to change and especially cut back on their available choices. The recent surge in popularity of the Tea Party movement in America is a textbook case of what Hardin identified. The extreme nature of the Tea Party's focus on personal freedom without concern for its long term costs to the planet and other citizens is captured elegantly in Hardin's most famous quote: "individual freedom in the Commons, brings ruin to all" (1968, p. 1257).

Hardin's focus on the problem of defectors and free-riders stems from a longstanding concern first raised in detail by Thomas Malthus (1798/1966). Malthus pointed out that population size is indeed a serious concern with respect to the way in which a group draws its subsistence from the land. When any size group or society takes more than it needs to survive, irrespective of their quality of life or prosperity, they are forced to look elsewhere to make up the difference. Resources might be available just over the next hill or valley. Ordinarily there would be no problem as long as total population remained small as it did for nearly seven million years. Over the course of human natural history, population was always held in check by several natural factors the same way it is maintained in nonhuman species. However, once humans were distributed across the planet such as we see today, the next pasture or valley is likely to be claimed already by other individuals or another society. Therein lays the contemporary problem with global population. When drought or any number of possible environmental or socio-political factors threatens to compromise a society's ability to meet its survival needs, the individuals are at the mercy of other governments or corporations. Global inequalities in food and other resource availabilities driven by geographic, climatic, and even sociopolitical, industrial and commercial factors is increasing the pressure on the environment to provide enough for all 6.8 billion inhabitants. Given that food resources are inextricably dependent on solar radiation and the amount of available arable land, there is a finite limit to how much the planet can provide. Thus, the problem of population is a physical one.

It is for this very reason that we question purely cultural or philosophical solutions to mass extinction, deforestation, desertification, climate-change, global warming, loss of biodiversity and other environmental effects. Environmental sustainability cannot be achieved by wishful thinking and empty calls for behavioral change. Substantive change will be achieved by a careful assessment of human motivations and predispositions toward self-interest (Rees, 2006). To that end, environmentalists calling for people to adopt sustainable practices would do well to reexamine their beliefs and assumptions about consumers and understand they are driven by an interactive combination of both biological predispositions/drives as well as cultural practices, social, and media-based influences (Pratarelli, 2008).

### *Nondualism and Environmental Decay*

Non-dualism is a popular modern philosophy—as exemplified in the Buddhist tradition—that has been put forth as a vital perceptual shift humanity will need to take to be of service to ourselves and the earth. This is problematic for several reasons. First, no religion, including those that try to foster an optimal ethical human and nature relationship as Potter has suggested, has been successful in

worldwide conversion (1995). Second, even if it were feasible, predominantly Buddhist countries such as China, Japan or Nepal that have practiced nondualism for centuries would have different ecological footprints and consumptive habits, yet they do not. If belief systems have the power to halt humanity's rape of the earth, then why is it that China is adopting a Western lifestyle faster than any other country today? In 1992, one household per hundred owned a conventional gasoline powered automobile (Schmitt, 2010). Households are often composed of more than one generation and shared with other extended family. Presently, the estimates for China, a country with 1.3 billion citizens—half of which live in urban centers—is that there are about 420 such vehicles per 1000 people. Reconciling the two estimates suggests that per capita car ownership has increased by more than a factor of 500 in just 18 years. This is why most societies are grasping at the American/Western way of life. Pinker (2002) suggests that “people have wants and needs, and when cultures rub shoulders, people in one culture are bound to notice when their neighbors are satisfying those desires better than they are. When they do notice, history tells us, they shamelessly borrow whatever works best” (p.66). The reason Western culture has become so rampant is because it works better in the daily struggle to survive, that is, in the short-term. Our long-term adaptiveness to a dynamic and rapidly changing environment has yet to be understood as recent assessments of the planet's ecological integrity are showing (cf., MEA, 2005; Rees, 2010; UCS, 1992).

What our species is faced with is the biological reality that we are as anthropocentric as other species are logically centered on themselves. Successful continuous evolution necessitates the focus or tuning of a species' short-term interests on itself as opposed to expending attention and energy on other species and the environment in general. This condition may be interpreted as a predisposition toward dualism as the extant neurotheology and evolutionary psychology literature suggests (cf., Atran & Norenzayan, 2004; Newberg, 1999; Norenzayan & Shariff, 2008). Humans appear to have a psychological processor dedicated to beliefs that sooth and provide ready explanations for what is seemingly unexplainable (Shermer, 2000). If such is the case, then nondualist philosophies like Buddhism face a greater likelihood of either being dismissed entirely because they contradict our nature, or reshaped to accommodate some degree of material self-interest and our anthropocentric nature.

Our extinction is a strong possibility according to some who are not dismissed as alarmists.<sup>3</sup> Charles Darwin (1859) once noted that “as natural selection works solely by and for the good of each being, all corporeal and mental endowments will tend to progress towards perfection” (p. 243). In contrast, Dobshansky (1958) commented that “no biological law can be relied upon to insure that our species will continue to prosper, or indeed that it will continue to exist” (p. 1092). Many species have gone extinct. The example of the giant Panda that has driven itself to near-extinction by adapting itself to a unique diet of bamboo is an excellent case of overspecialization in a diverse ecosystem (Gould, 1982). Should the integrity of their local ecosystem be sufficiently weakened or completely destroyed as many fear, the species is forever lost in its natural state. Similarly, inasmuch as the major cognitive adaptation for our species is its ability to innovate,

we are becoming increasingly overspecialized and thus unable to back out of our dependence on more and more technology (Pratarelli & Chiarelli, 2007).

If humanity is the goal—which is at the heart of any definition of anthropocentrism—then the specific objective of our (human) nature would be or at least ought to be the “preservation” of our DNA and the “maintenance of its intraspecific variability” (Chiarelli, 1995, 3). 1700 members of the Union of Concerned Scientists (UCS, 1992) stated the following: “...a great change in our stewardship of the earth and the life on it is required if vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated.” Similarly, the authors of the Millennium Ecosystem Assessment (MEA, 2000) stated that “human activity is putting such a strain on the natural functions of the Earth that the ability of the planet’s ecosystems to sustain future generations can no longer be taken for granted” (p. 153). The problem is that we compromise both the environment and ourselves in the long-term (i.e., in geologic time) because we simply cannot continue to consume and waste at the rates that we do. Rees (2002) calculated the collective human ecological footprint and showed that since about 1986, the global population is consuming in excess of the planet’s ability to restore natural resources and assimilate the considerable waste products. That is, we are in a condition of overshoot. His calculations show that if all the billions of citizens were given the capacity to consume at Western/American standards of living, we would need several more planets identical to our own to accommodate the demand for resources. More importantly, if we factor into the consumption-footprint equation the United Nations’ most recent population projections update for the year 2050 (the Mean projection is 9.2 billion), then the amount of energy and all other resources combined would occupy as many as six or seven planet earths. Of course, new green technologies on the horizon when they come online and adopted universally might partially offset the need for a few of those planets, but not six to seven. When the inputs and outputs of the grand system are computed in this light and human nature is assumed to be an immutable force that generates culture for its own ends, the prospects of achieving for all human beings sustainable levels of economic development while continuing to maintain reasonable levels of human dignity is bleak. Thus, the assumption of many environmentalist writers and scientists who (knowingly or unknowingly) argue on the basis of the noble savage and blank slate that humans will voluntarily cut back their consumption or roll back their standard of living by as much as 80 percent (among Westerners, to account for the 6-7 planets needed for global consumption at that level), is dubious.

The vision that everyone will adopt (through education presumably) a nondualist and nonmaterialist philosophy is just another human fantasy or myth seen illustrated in virtually every modern religion; god (or nature) loves us best of all and wants us to survive more than anything else and at the expense of our natural surroundings. In reality, there is a chance that nature placed within us the mechanism(s) of our own demise as Dobzhansky (1958) suggested. In the end, we are entirely too anthropocentric as individuals, societies, and as a species (as it should be according to the essential principles of evolution) to ever believe or accept that extinction or mass pruning of our species is a real possibility. Were people or their governments to publicly admit it, they might begin demanding real changes in policy that serve the long-term interest of both our species and the rest

of the ecology of the planet. It should come as no surprise that there is as yet little evidence from our consumerist culture that such demands are being made. As Potter (1995) noted, even Darwin was biased by the human-centered beliefs of his day and thus was “pleasantly unaware” that humanity was indeed at risk because of this potentially “fatal flaw” (p. 110). The fatal flaw is that long-term interests need to be the universal focus of consumers if we are to avoid overshoot and collapse. Yet, those same consumers are biologically predisposed to focus on their personal and kin-related survival above all else, i.e., their short-term best interests (Miller, 2009; Pratarelli, 2003, 2008; Saad, 2007). While cooperation is indeed possible and an emergent property of people under particular conditions that insure a common benefit, it is not universally observed—as was the case recently in Copenhagen. The concerned environmentalist needs to be aware that failures to reach cooperative political agreements at the international level are likely to be the norm in the foreseeable future unless greater pressure from the changing environment appears first.

The dilemma is that we compromise both the environment and ourselves in the long-term (i.e., in geologic time) because we simply cannot continue to consume and waste at the rate that we do. Current projections also tell us that even cutting back by 50 percent by 2050 will not avert the effects many scientists have been studying through simulations (cf., Meadows, Randers, & Meadows, 2004; Turner, 2008). The proposed *New Deep Ecology Platform* (Bender, 2003, p. 448) covers every foreseeable change that must occur, except the realization *by humanity about humanity*. That is to say, a reliance on empirically weak assumptions about human nature or ill-conceived postmodern beliefs of the noble savage sort will result in more ecological damage and decay. Failure to respect the existence of the universals in human behavior and motivation can be seen in the ineffective actions of the modern environmental movement of the last 40-50 years (Dunlap & Marshall, 2007). That movement meant well and it fostered at least the beginnings of pro-environmental change in human behavior, but its working assumptions about human nature are hopelessly inhibited by Lockean and Rousseauvian ways of thinking.

To be fair, while the evidence that humanity is in a condition of overshoot (Meadows et al., 2004; Turner, 2008) is robust and disconcerting, it must be recognized that many changes in lifestyles and personal choices have led to improvements in the condition of many local ecosystems. A notable example was the banning of the pesticide DDT after Rachel Carson famously wrote about its toxicity in *Silent Spring* (1962). More recently, many people’s behaviors have begun to change in favor of preservation and conservation of open space (e.g., legislation creating and protecting sanctuaries), wildlife (e.g., campaigns to save polar bears and other endangered species), fresh water (e.g., fewer gallons per flush toilets), energy (e.g., new florescent light bulbs; renewable energy technologies like solar, wind, etc.), and most conspicuous of all, community-based recycling programs. While these changes provide society with a sense of hope for a better and more sustainable future, it is important to note that variations in behavior are entirely predicted on the basis of evolutionary theory. Variations are necessary as the source for future change and speciation. Whether it is due to subtle genetic mutations resulting in different brains with different ways of processing information that are increasingly selected-for given the changed environment we live in, or

whether culture shapes behavior outwardly should be of less concern to us so long as the change ultimately benefits the integrity of the environment, and in turn, humanity. Environmentalists would do well to examine what in fact drives human behavior and exploit those factors in the future rather than believing that selfless thinking and unconditional cooperation is just around the corner. A notable recent example they might learn from of our biological predispositions at work in environmental conservation was the impact on people's driving behavior in 2008 when gasoline prices soared in a short period of time. People drove less because the cost was significantly higher. To maintain their sense of survival-related personal security, the financial savings from driving less, which conserved fuel-energy and reduced emissions, meant they continued to have the means of feeding themselves and conducting other survival-related activities. This was done universally and more or less unconsciously, as there were no public service announcements made that sought to educate citizens. A very similar phenomenon was seen in the extreme conservation related behaviors adopted during the period in the United States known as the Great Depression. By understanding the economics of biological systems (Vermidj, 2004), environmentalists might better understand how humans might be persuaded through education and other means to achieve sustainability.

It is our conclusion, therefore, that if we are to preserve the integrity of the global ecosystem, and humanity, then the only hope lies in our truly admitting to our biological constraints (human nature) and then learning to work with who we are rather than what we might be or could have been. This also means that we will have to contend with the insidious effects of human denial (Pratarelli, 2008). Individuals and their many social institutions—especially modern religions—will have to confront the compelling urge to avoid dealing with problems that may seem insurmountable to the average citizen. Nonetheless, as Anton Chekhov famously wrote: “Man will become better when you show him what he is like”. Facing the reality of who we are is only a precondition. If the most technologically advanced and prosperous cultures do not admit how much the rest of humanity desires their dangerous exploitative lifestyle—as well as the reasons why they aspire to it—any attempts to implement change will eventually be overpowered by the very biological drives we seek to dismiss. Relying on myths and narratives like the noble savage and the blank slate only reinforce the implicit denial of people about their industry, their cultures and most importantly their nature. It is our belief that humanity stands to profit enormously from the contributions that evolutionary biology has made in general, and human evolutionary psychology in particular, toward our modern understanding of human nature. Failure to adapt in light of our growing understanding of the causal relationship between human drives and climate change may cost both humanity and the planet dearly.

### Acknowledgments

We wish to thank Fred Bender for his valuable comments on an earlier draft of the manuscript, along with the constructive reviews of an anonymous reviewer and the Editor, Rosemarie Chang.

## References

- Atran, S., & Norenzayan, A. (2004). Religion's evolutionary landscape: Counterintuition, commitment, compassion, communion. *Behavioral and Brain Sciences*, 27, 713-770.
- Barkow, J. H., Cosmides, L., & Tooby, J. (Eds.). (1992). *The adapted mind: Evolutionary psychology and the generation of culture*. New York: Oxford University Press.
- Bender, F. (2003). *The culture of extinction: toward a philosophy of deep ecology*. New York: Humanity Books.
- Buss, D.M. (1995). Evolutionary psychology: A new paradigm for psychological science. *Psychological Inquiry*, 6, 1-30.
- Capra, F. (1996). *The web of life*. New York: Anchor Books.
- Carroll, J.B. (1956). *Language, thought and reality: Selected writings of Benjamin Lee Whorf*. Cambridge, MA: The MIT Press.
- Carson, R. (1962). *Silent spring*. Boston, MA: Houghton, Mifflin Co.
- Chiarelli, B. (1995). The carrying-capacity of the environment as it relates to reproductive morality. *Global Bioethics*, 8(4), 149-157.
- Chiarelli, B. (2003). *Dalla natura alla cultura. (Volumes I, II, III)*. Padova, IT: Piccin Press.
- Cosmides, L., & Tooby, T. (1992). Cognitive adaptations for social exchange. In J.H. Barkow, L. Cosmides, & J Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture*. New York: Oxford University Press.
- Crichton, M. (2003). Environmentalism as religion. Presentation to the Commonwealth Club of San Francisco, California, September 15. Retrieved 09/20/2009 at: [http://www.crichton-official.com/speeches/speeches\\_quote05.html](http://www.crichton-official.com/speeches/speeches_quote05.html).
- Darwin, C. (1859). *The origin of species by means of natural selection*. London: John Murray.
- Dobzhansky, T. (1958). Evolution at work. *Science*, 127, 1091-1098.
- Dunlap, R.E., & Marshall, B.K. (2007). Environmental sociology. In Clifton D. Bryant and Dennis L. Peck (Eds.) *21<sup>st</sup> Century sociology" a reference handbook*, Vol. 2. (pp. 329-340). Thousand Oaks, CA: Sage.
- Gedicks, A. (1993). *The new resource wars: Native and environmental struggles against multinational corporations*. Boston: South End Press.
- Goodenough, J., McGuire, B., & Jacob, E. (2009). *Perspectives on animal behavior*. Hoboken, NJ: John Wiley & Sons.
- Gould, S.J. (1982). *The panda's thumb: More reflections in natural history*. New York: Norton.
- Hardin, G. (1968). The tragedy of the Commons. *Science*, 162, 1243-1248.
- Harner, M. (1977). The ecological basis of Aztec sacrifice. *American Ethnologist*, 4(1), 117-135.
- Holloway, R.L., Broadfield, D.C., Yuan, M.S., Schwartz, J.H., Tattersall, I. (2004). *The human fossil record, brain endocasts: The paleoneurological evidence, Volume 3*. New York: Wiley-Liss.

- Holthaus, G. (2008). *Learning native wisdom: What traditional cultures teach us about subsistence, sustainability, and spirituality*. Lexington, KY: University Press of Kentucky.
- Jacobs, A. (2009). *Native American wisdom: A spiritual tradition at one with nature*. London: Watkins.
- Kerber, L.K. (1986). *Women's America: refocusing the past*. New York: Oxford University Press.
- Leopold, A. (1949). *A Sand County almanac and sketches here and there*. New York: Oxford University Press.
- Lewis, D.R. (1995). Native Americans and the environment: A survey of 20<sup>th</sup> century issues. *American Indian Quarterly*, 19, 423-450.
- Lieberman, D.E., McBratney, B.M. & Krovitz, G. (2002). The evolution and development of cranial form in *Homo sapiens*. *Proceedings of the National Academy of Sciences*, 99, 1134-1139.
- Malthus, T. (1798/1966). *An essay on the principle of population as it affects the future improvement of society*. New York: St. Martin's Press.
- MEA. (2005). Living beyond our means: Natural assets and human well-being. (Statement from the Board). *Millennium Ecosystem Assessment*. Retrieved online 12/30/2009 at:  
<http://www.millenniumassessment.org/documents/document.429.aspx.pdf>
- Meadows, D.H., Randers, J., Meadows, D.L. (2004). *Limits to growth: The 30-year update*. White River Junction, VT: Chelsea-Green Publishing Co.
- Miller, G. (2009). *Spent: sex, evolution, and consumer behavior*. New York: Penguin Books.
- Naess, A. (1973). The shallow and the deep: Long-range ecology movement. A Summary. *Inquiry*, 16, 95-100.
- Newberg, A.B. (1999). *The mystical mind: Probing the biology of religious experience*. Minneapolis: Fortress Press.
- Norenzayan, A., & Shariff, A. F. (2008). The origin and evolution of religious prosociality. *Science*, 322, 58-62.
- Orr, D.W. (1992). *Ecological literacy: Education and the transition to a postmodern world*. New York: State University of New York Press.
- Pinker, S. (2002). *The blank slate: The modern denial of human nature*. New York: W.W. Norton & Company.
- Potter, V.R. (1995). Getting to the year 3000: Can global bioethics overcome evolution's fatal flaw? *Global Bioethics*, 8(4), 107-114.
- Pratarelli, M.E. (2003). *Niche bandits: Why big brains consumed an ecosystem*. Colorado: Medici Publishing, Inc.
- Pratarelli, M.E. (2008). *Myopic man: On the nature and universality of human self-deception and its effects on our environment*. Colorado: Medici Publishing, Inc.
- Pratarelli, M.E., & Chiarelli, B. (2007). Extinction and overspecialization: The dark side of human innovation. *The Mankind Quarterly*, 48, 83-98.
- Rees, W.E. (2002). Globalization and sustainability: Conflict or convergence? *Bulletin of Science, Technology and Society*, 22(4), 249-268.

- Rees, W.E. (2006). Ecological footprints and bio-capacity: Essential elements in sustainability assessment. In: J.Dewult & H.van Langenhove (Eds.), *Renewables-based technology: sustainability assessment* (pp.143-158). Chichester, UK: John Wiley and Sons.
- Rees, W.E. (2010, in press). What's blocking sustainability? Human nature, cognition and denial. *Sustainability: Science, Practice and Policy*.
- Renfrew, A.C. (2009). *Prehistory: The making of the human mind*. New York: Modern Library.
- Rousseau, J.J. (1755/1994). *Discourse upon the origin and foundation of inequality among mankind*. New York: Oxford University Press.
- Saad, G. (2007). *The evolutionary bases of consumption*. Mahwah, N.J.: Lawrence Erlbaum.
- Shackelford, T.K. (2006). Recycling, evolution and the structure of human personality. *Personality and Individual Differences*, 41, 1551-1556.
- Schmitt, B. (2010). Heavens! 16.7 million vehicles sold in China? Retrieved online on 01/21/2010 at:  
<http://www.thetruthaboutcars.com/heavens-16-7-million-vehicles-sold-in-china/>
- Shermer, M. (2000). *How we believe: Science, skepticism, and the search for god*. New York: W.H. Freeman & Company.
- Shepard, J.M. (2010). *Sociology*. Belmont, CA: Wadsworth Cengage Learning.
- Turner, G.M. (2008). A comparison of *the limits to growth* with 30 years of reality. *Global Environmental Change*, 13, 397-411.
- UCS (1992). *World scientists' warning to humanity*. Union of Concerned Scientists, Cambridge: MA. Retrieved online 01/04/2010 at:  
<http://www.ucsusa.org/about/1992-world-scientists.html>
- Vermidj, G.J. (2004). *Nature: An economic history*. New Jersey: Princeton University Press.
- Vidal, J., Stratton, A., & Goldenberg, S. (2009). Low targets, goals dropped: Copenhagen ends in failure. Retrieved on 12/31/2009 at:  
<http://www.guardian.co.uk/environment/2009/dec/18/copenhagen-deal.html>.
- Vinje, D.L. (1996). Native American economic development on selected reservations: A comparative analysis. *American Journal of Economics and Sociology*, 55(4), 427-442.
- Wilson, D.S. (2007). *Evolution for everyone*. New York: Delta.
- Wilson, E.O. (2000). *Sociobiology: The new synthesis, 25<sup>th</sup> anniversary edition*. Cambridge, MA: Belknap Press.

\*\*Received March 19, 2010; Revision received February 7, 2011;  
Accepted April 8, 2011\*\*