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# UNDERSTANDING HUMAN NATURE: FROM AN EVOLUTIONARY PSYCHOLOGICAL PERSPECTIVE

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## ABSTRACT

Management scholars have paid relatively little attention to human nature. We consider this a deficiency for developing a more accurate understanding of organizational behavior and more effective organizational interventions. We argue that Darwinian evolutionary psychology provides us useful conceptual tools to advance our understanding of human behavior in organizations. Beginning with a brief history of evolutionary thinking in social sciences, we present a general introduction of evolutionary psychology followed by some of its practical implications for managers. We conclude by addressing some of the criticisms against research that applied evolutionary psychology to the field of management and organization studies.

## INTRODUCTION

It is a truism that nothing in biology makes sense except in the light of evolution (Dobzhansky, 1973). Indeed, evolution by natural selection has shaped not only our genetic make-up but our capacity for culture (Ehrlich, 2002; Wilson, 1978). In this sense, evolution is not merely about fossil records; our desires, intentions, and social behaviors have strong biological underpinnings and have been sculpted by evolution by natural selection (Wilson, 2007). Human nature is thus a complex product of dual processes of biological and cultural evolution (Durham, 1991; Gangestad & Simpson, 2007; Laland & Brown, 2002; Richerson & Boyd, 2005).

Yet, questions about the origin of human nature and its impacts on human behavior are discussed only superficially in management and organization studies (MOS). In a typical undergraduate management course, students will be exposed to a few dated theories about human nature and human motivation — for instance, Douglas McGregor's (1960) Theory X and Theory Y and Abraham Maslow's (1943) Theory of Need Hierarchy. We consider the current treatment of the subject is not enough because a *realistic* understanding of human nature has various practical implications for diverse managerial issues. In this paper we claim that Darwinian evolutionary psychology (EP) will enrich our understanding of human nature and organizational behavior. We

begin by explaining why researchers and scholars in MOS have been somewhat reluctant to adopt the Darwinian evolutionary perspective in the larger historical context of Darwinian thinking in social sciences. We then provide a general introduction of EP and its practical implications for managers, followed by acknowledging some of the criticisms leveled against evolutionary perspectives on management and organization.

**A Brief History of Darwinian Thinking in Social Sciences**

If one reflects upon the history of Darwinian thinking in social sciences, it becomes clear that the term, "survival of the fittest," was often misunderstood and even abused. The wrongheaded association of evolutionary theory with social Darwinism (a term coined by the sociologist Herbert Spencer) and eugenics actually helped to close off discourse and scientific progress in evolutionary approaches in social sciences. The social Darwinists attributed differences in socio-economic status to biological differences; people who were more biologically "fit" would naturally rise to the top of the pecking order, thus "survival of the fittest." Eugenics (a term coined by Francis Galton) advocated selective breeding as a means to improve society. These were not fringe movements led by crackpots; they were popular social philosophies articulated by prominent intellectuals and academics (e.g., Yerkes at Harvard; Thorndike at Columbia). Courses on eugenics were taught at the time at Harvard, MIT, and Chicago. By 1930, laws mandating sterilization of criminals and the insane had been introduced in 30 states of the United States (Plotkin, 2004).

These ideas arose when the state of evolutionary theory was still relatively unsophisticated and the understanding of evolutionary theory by social Darwinists and eugenicists was even less sophisticated. For example, equating survival of the fittest with socio-economic status reveals a misunderstanding of Darwinian fitness. Fitness in classical Darwinian theory refers to the number of offspring produced, not standing in the pecking order. In fact, social Darwinism is still being used as an epithet; many critics have argued that biological studies of human social behavior (including EP) justify a status quo and thus validate social injustice. However, an evolutionary *explanation* of status-seeking behavior in a social hierarchy or the existence of social ranking in both animal and human societies is not equal to a *justification* for it (Hagen, 2005). In other words, a neo-Darwinian evolutionary study of human behavior (including EP) is not a moral framework, but a scientific research program for understanding human nature.

Similarly, the eugenicists' goal of improving the human race by selective breeding indicated a fundamental misunderstanding of the role of unplanned variation in evolution. Variation is the engine that drives evolution and adaptation: there can be no evolution without variation. Eugenics, by narrowing variation, would actually reduce potentially adaptive variations.

By the late 1930s, support for these movements began to wane, and they were soon reviled. As social Darwinism and eugenics became more and more criticized, one unintended consequence was that *any* evolutionary perspective on human nature became tainted by guilt by association. Social scientists, according to van den Berghe (1978, p. 25), tried to "atone for their intellectual sins by dogmatically rejecting any notion that biological heritage helps to account for behavior."

Historically researchers and scholars in MOS have also ignored much of Darwinian ideas. There are several reasons for this. First, management scholars typically do not enter the field with biological backgrounds — undergraduate or graduate degrees, say, in biology or genetics. They are more likely to enter the field of Organizational Behavior (OB) with backgrounds in business, psychology, or sociology. Thus, management scholars typically have little background in biology. Given that understanding OB from evolutionary and biological perspectives requires an interdisciplinary bent, scholars must not only develop expertise in their own area of OB, but must also develop a knowledge base in a cognate biological area.

Second, biological explanations may have also been slow to catch on among scholars in MOS because biology is associated with costs to organizations, rather than with opportunities. For instance, most discrimination has some biological basis (Kurzban & Leary, 2001). Furthermore obvious biological differences among employees – sex, race, ability and disability, and age – have been the major sources of employment discrimination and the impetus for equal employment opportunity (EEO) law and interventions into organizational human resource (HR) policy. Health-related factors associated with workforce are biological – illness, injury, pregnancy – and these have negative connotations to employers.

Third, many theories and implicit images of organizations tend to be mechanical, conscious, deliberate, volitional, and rational (Morgan, 2006). The very notion of *management* implies that managers can plan for outcomes and then actively manipulate parts of organizations (i.e., structures, information, incentives, skill and talent mix) to achieve the desired results. Biology may be viewed by management scholars and practitioners as deterministic, unconscious, and uncontrollable, and thus they may believe that biological factors are inherently unmanageable. This view is, of course, misguided. If indeed biological factors influence behavior in organizations, managers (or anyone else who works in an organization) will be empowered if they understand this—and at a disadvantage if they do not understand this.

In other words, just because something has a biological basis does not mean that it is inherently unmanageable. Consider aging. People grow old; aging is an inevitable biological process. However, understanding the nature of that biological process enables us to have some effect on how quickly we age. We know that aging is caused by the body's loss of ability to repair routine (and non-routine) cell damage. Therefore, taking good care of our health will minimize cell damage and slow down the aging process. Quitting smoking, eating sensibly, and exercising within the limits of one's physical abilities all affect cell health and can keep people youthful longer. The same logic applies to organizationally relevant biological factors. For example, if we know that job satisfaction and leadership have large genetic components (Arvey, Bouchard, Segal, & Abraham, 1989; Arvey, Zhang, Avolio, & Krueger, 2007), this suggests that a greater emphasis be placed on selection than training. Simply put, biology is not a destiny unless one ignores it (Barkow, 1989).

## EVOLUTIONARY PSYCHOLOGY AND ITS PRACTICAL IMPLICATIONS

### Evolutionary Psychology: A Brief Introduction

Until recently, much of the thinking about causality in the social sciences has followed what Tooby and Cosmides (1992) call the standard social science model (SSSM). The SSSM holds that much of the variation in human behavior is due to culture and socialization. According to this view, humans are unique among species in that biological and instinctual constraints play a relatively small role. This view is no better epitomized than by the following passage from John B. Watson (1924/1970) on the malleability of human nature:

> Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant-chief, and, yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors. (p. 104)

The prominence of SSSM in the social sciences began in the early 20th century and is still prominent, though less so, today. Sullivan (1986), for instance, argued that most management theories (e.g., Theory X, Theory Y, human relations, human resources, and learning theories) have their theoretical foundation on the optimistic ideal of human malleability; thus "humankind has a nature bounded by laws and rules in such a loose manner as to make humans *almost infinitely* [emphasis added] malleable" (p. 539).

Yet, as van den Berghe (1974) pointed out, we need to strive for a realistic conception of human nature which is consistent with actual observable behavior, not with what we hope our behavior might be. Barash (1979) also made it clear that:

> Biology whispers deep within us, and if we use our knowledge of natural selection to eavesdrop, we may yet hear those whisperings and discover something new and something exciting about ourselves. (p. 45)

The seed of an interdisciplinary collaboration between biology and psychology actually dates back to Charles Darwin. In *On the Origin of Species* (1859/1979), Darwin described the origin of an instinctive behavior of the hive-bee:

> Thus as I believe, the most wonderful of all known instincts, that of the hive-bee, can be explained by natural selection having taken advantage of *numerous, successive, slight modifications of simpler instincts* [emphasis added]*;* natural selection having by slow degrees, more and more perfectly, led the bees to sweep equal spheres at a given distance from each other in a double layer, and to build up and excavate the wax along the planes of intersection. The bees, of course, no more knowing that they swept their spheres at one particular distance from each other, than they know what are the several angles of the hexagonal prisms and of the basal rhombic plates. The motive power of the process of natural selection having been economy of wax; that individual swarm which wasted least honey in the secretion of wax, having succeeded best, and *having transmitted by*

> *inheritance its newly acquired economical instinct to new swarms which in their turn will have the best chance of succeeding in the struggle of existence* [emphasis added]. (p. 256)

Towards the end of the book Darwin (1859/1979) also anticipated that "psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation" (p. 458). Influenced by Darwin, William James (1890/1950) thus defined an instinct as "the faculty of acting in such a way as to produce certain ends, without foresight of the ends, and without previous education in the performance" (p. 383). He further argued that humans have a far greater variety of impulses than any lower animal and there is no antagonism between instinct and reason:

> Reason, *per se*, can inhibit no impulses; the only thing that can neutralize an impulse is an impulse the other way. Reason may, however, make an *inference which will excite the imagination so as to set loose* the impulse the other way; and thus, though the animal richest in reason might be also the animal richest in instinctive impulses too, he would never seem the fatal automaton which a *merely* instinctive animal would be. (1890/1950, p. 393)

From the 1920s to 1980s, however, the social sciences, including psychology, were dominated by the SSSM. The proponents of the SSSM believed that human nature is unique among all species in that human nature alone is shaped primarily by experience. Accordingly, biological constraints on human behavior were considered relatively unimportant (Tooby & Cosmides, 1992). During this period, the Darwinian view on human nature was largely ignored in social sciences.

Yet, studies on the evolutionary biological foundation of human nature and its implications for human social behavior have grown exponentially for the past three decades (Gangestad & Simpson, 2007). For instance, evolutionary psychology (EP) as a synthesis of neo-Darwinian evolutionary biology and modern cognitive psychology has emerged over the past 15 years as a major meta-theoretical perspective in psychology (Confer et al., 2010). EP views human cognition and emotion as products of evolution and applies the theory of evolution by natural selection to understand human behavior (Barkow, Cosmides, & Tooby, 1992; Buss, 1999). The key conceptual foundation of EP is that members of our species share a set of universal psychological and behavioral traits inherited from our distant ancestors. Those traits are adaptations that contributed to our distant ancestors' survival and reproduction.

According to EP, we have our unique human nature which distinguishes us from other species and it was sculpted by two mechanisms: natural selection and sexual selection (Pinker, 1997). Surprisingly, the idea of natural selection is not difficult to understand:

> If individuals within a species differ genetically from one another, and some of those differences affect an individual's ability to survive and reproduce in its environment, then in the next generation the "good" genes that lead to higher survival and reproduction will have relatively more copies than the "not so good" genes. Over time, the population will gradually become more and more suited to its environment as helpful mutations arise and spread through the population, while deleterious ones are weeded out. Ultimately, this

> process produces organisms that are well adapted to their habitats and way of life. (Coyne, 2009, p. 11)

Sexual selection basically means that organisms with a certain trait that makes them attractive to the opposite sex tend to have more offspring than those without the trait, so the organisms with the trait would spread their genes more successfully than their counterpart (Miller, 2000; Ridley, 1993). Simply stated, traits that make individuals unattractive to the opposite sex can be hardly transmitted because those individuals with unattractive traits are less likely to find a mate and therefore can't reproduce.

Given that our distant male and female ancestors in small hunter-gatherer societies had different kinds of adaptive problems to solve (Lee, 2003; Thomas, 2006), it is thus very likely that men and women have inherited different mental programs and strategies to deal with sex-specific problems. As for mating strategies, for example, our female ancestors faced problems of protecting and securing resources for offspring, and therefore women evolved preferences for men who are competitive, have high status, and possess ample resources. In contrast, our male ancestors faced problems of deciding which women to mate with and which ones would be most fertile. Therefore men evolved preferences for women with a youthful appearance and an hour glass figure (Buss et al., 1990; Winston, 2002). As mating and reproduction pose different problems for men and women, one might be better to think of human *natures* along the fault line of sex since selection has designed certain sex-specific suites of complex adaptations for solving these problems.

In a nutshell, a majority of evolutionary psychologists are "adaptationists" who believe that "animals and plants, their body parts and their behaviors, consist largely of designs to solve particular problems" (Ridley, 1993, p. 14). Accordingly, the human mind is conceptualized as a composite of evolved domain specific psychological adaptations (i.e., functional algorithms or mental programs) which helped our distant ancestors to solve specific adaptive problems during the Pleistocene era (i.e., 2.5 million to 11,000 years ago) (Cosmides, Tooby, & Barkow, 1992). How natural selection had shaped the adapted psychological modules of the human mind is eloquently described by Cosmides et al. (1992):

> Natural selection can generate complex designs that are functionally organized – so that they can solve an adaptive problem – because the criterion for the selection of each design feature is functional: a design feature will spread only if it solves an adaptive problem better than existing alternatives…. Evolution by natural selection is the only presently validated explanation for the accumulation of functional design features across generations…. By understanding the selection pressures that our hominid ancestors faced – by understanding what kind of adaptive problems they had to solve – one should be able to gain some insight into the design of the information processing mechanisms that evolved to solve these problems. (p. 9)

In this paper, we thus define human nature as our species' universally shared emotional, cognitive and behavioral predispositions, which stem from evolved, heritable adaptations. That we inherited adapted psychological tendencies shaped by evolution by natural selection *under ancient environmental pressures* has significant implications for us living and working in the 21st

century. Stated a bit differently, the idea that our mental programs were sculpted under different environmental pressures means that we still possess the psychological make-up of the stone-age mind while living and working in a modern environment. We as a species have a capacity to learn new information and restrain our instincts; however, we cannot master them and thus completely free them from our genetic heritage. Thus, we would better understand the practical implications of EP for managing people in modern organizations by reflecting upon the mismatches between ancient psychological adaptations and the demands of the current environment (Bernhard & Glantz, 1992; Colarellli, 2003; Crawford, 1998; Smith, 2002).

## Practical Implications of EP for Managing People in Organizations

Below we suggest three examples of practical implications of EP for managing people in organizations—motivation, in-group bonding, and organizational structure. We use these examples essentially to provide a flavor of EP's practical implications; they are by no means exhaustive.

### *Motivation*

A proposition that evolution has something to say about business management sounds puzzling at first. Interestingly, however, Darwin (1887/1958) pointed out that "it has come to pass that most or all sentient beings have been developed in such a manner through natural selection, that pleasurable sensations serve as their habitual guides" (p. 89). This means that our "biological incentive system" was molded by natural selection and our behavioral intentions have deep *biological underpinnings* (Irvine, 2006). That our evolved innate biological incentive system coordinates our inner experiences of pleasure, fear, anger, and pain has several implications for managing people in contemporary organizations.

First, as Nicholson (1998) argued, "emotions are the first screen to all information received and they can never be fully suppressed" (p. 138). We often react emotionally and then justify our behavior rationally at some point later. We also remember negative information better than positive information and thus the former probably has a greater influence on our decision making process (Kahneman & Tversky, 1979). This is actually why both employers and employees dread performance appraisal as employees tend to selectively focus on the negative comments of employers regardless of their good intention (Nicholson, 1998).

Second, we are more sensitive to loss when gain is possible, but we generally prefer risk when loss is possible (Kahneman & Tversky, 1982). According to Moore (1996), our loss aversion and risk preference were shaped by natural selection under two different contingencies of the stone-age economy:

> In a subsistence economy loss of resources could critically impair reproductive potential, and thus it could be adaptive to assume the risks of fighting to prevent the loss of discrete resources…. Perhaps the principle is that it is better to have a little something to ensure immediate survival or at least minimal reproductive success and worse to have nothing and risk hardship, starvation, death, or total reproductive failure. (p. 394)

Even in our digital economies, we still observe how our instincts for loss aversion and risk preference have influenced our decision making process:

> Every financial-markets trader can recite the old saw, "Cut your losses and let your profits run." The same traders will also tell you that this rational rule of thumb is the hardest thing they have to learn on the job. Their instinct is to take risks as soon as losses start to mount. A stock starts to fall and they double-up their positions, for instance. That's the frantic fight to survive in action. And similarly, it's instinct that drives people to sell while a stock is still rising. That's risk aversion in action. That said, experienced traders know how damaging these instincts are; and they have rules and procedures that basically force them to cut their losses and let their profits run. But without such rules and procedures, human nature would most likely take its course. (Nicholson, 1998, pp. 138 – 139)

Related to this, we value the present by maintaining the status quo and feeling overconfident even when the outlook for the future is risky and uncertain. Akerlof and Shiller (2009), for instance, attributed the failure of forecasting the recent collapses of some financial institutions to the ignorance of the role of *animal spirits*; people tend to feel safe and fail to notice until real events – the collapse of banks, the loss of jobs, mortgage foreclosures – were upon them.

It would be thus beneficial for managers to frame the impending change as threatening to maintain the momentum of change. It is also critical to realize that organizational members will resist change initiatives unless (a) they are dissatisfied with the current state, and (b) they are sure that benefits from the change are to be shared.

***In-Group Bonding***

That our distant ancestors lived a life of hunter-gatherers up until 10,000 years ago helps us understand why desire to bond with others is one of the strongest social needs of our species (Cacioppo & Patrick, 2008). However, we do not develop a relationship randomly. Lenski (1966), one of the few sociologists who adopted a Darwinian evolutionary perspective, wrote:

> In fact, it sometimes seems that the stronger the sacrificial tendencies in *intragroup* relations, the weaker such tendencies in *intergroup* relations. This means that *our judgments about the frequency and importance of sacrificial action in human life are a function of the social level on which we focus*. If we make the family or some other primary group the object of our analysis, we are far more likely to be impressed by the evidence of self-sacrifice than if we examine a large and complex nation. When we view human action in this broader perspective, as we shall in this volume, we soon discover that these groups which generate so much sacrificial action in their internal relations are often capable of the most ruthless pursuit of their partisan group interests when dealing with outsiders, even though the latter are members of the same society. (pp. 28 – 29)

From an evolutionary psychological perspective, this tendency of a strong in-group preference is an evolutionarily stable strategy for maximizing our genetic payoff (Salter, 2003). As helping family relatives to reproduce successfully enhances the altruist's genetic payoff indirectly,

evolution shaped us to favor those who are biologically related more than those who are not (Hamilton, 1964). Kin nepotism is thus a psychological adaptation and friendship (cronyism) is an extended form of nepotism with non-kin others based on repeated social exchanges (Page & Yang, 2010).

Accordingly, from the "gene politics" vantage point, our social relationship can be mapped in a concentric circle (i.e., family relatives the innermost, friends in between, and strangers the peripheral). We also perceive those who are biologically related more trustworthy (Yang, Colarelli, Han, & Page, in press). It is thus very likely that our desire to construct an internal representation of the social relationships is firmly rooted in our hardwired tendency to "classify people, situations, and experience into categories – good or bad, in or out – rather than engage in time-consuming and nuanced analysis" (Nicholson, 1998, p. 142). The mental map helps us navigate through our social space and categorize social information more efficiently. In this sense, our territorial behaviors in organizations (e.g., turf wars) are deeply entrenched in our biology and this is why it is so difficult to eliminate them from the organizational scene (Simmons, 1998).

***Organizational Structure***

We inherited a biological incentive system that conditions us to prefer working with people with more or less equal status in a relatively small group. According to Boehm (1999), modern hunter-gatherers do not live in a rigid dominance hierarchy; by developing and maintaining social mechanisms of sharing food and preventing severe competition and self-promotion, the hunter-gathers have deliberately subdued dominance struggles, particularly among males to promote egalitarianism in the band (Cashdan, 1990).

From an evolutionary perspective, a formal hierarchical structure of the organization is a recent evolutionary invention; it mismatches with the grain of our evolved human nature (Bernhard & Glantz, 1992; Colarelli, 2003). However, in all-male groups where chances for intra-group competition and agonistic struggle for limited resources are high, a hierarchical structure is adaptive since the hierarchy of dominance actually keeps competition and conflict at manageable levels (Colarelli, Spranger, & Hechanova, 2006). It is also well known that males and females have adopted different communication strategies (i.e., "genderlect") to influence others (Tannen, 1986). Accordingly, under the unstructured task condition, it may be more beneficial to select teams of women than to train men to behave in non-hierarchical problem-solving groups (Colarelli et al., 2006; Zand, 1974). Furthermore, if our tribal social instinct prompts us to prefer a social group with no more than 150 people (Dunbar, 1998), then organizations might benefit by restructuring their units so that they do not exceed 150 people (Nicholson, 1998).

It is also frequently observed in contemporary organizations that people compete for the limited resources and constantly engage in public contests (Nicholson, 1998). Both men and women gossip and spread rumors to enhance their status in a hierarchy and taint the reputations of social rivals but tend to conceal them about friends and lovers (Confer et al., 2010). Interestingly, there are some sex differences in spreading damaging gossip; men tend to focus more on deficiency in athletic and professional prowess while women focus more on appearance and sexual conduct (Buss & Dedden, 1990).

Practically speaking, it is almost impossible for managers to control gossip and eliminate rumor at the workplace: it is better to make the best use of our penchant for storytelling. For instance, by sharing tacit knowledge and core values of the community through informal meetings and online channels, managers could better socialize newcomers and maintain strong organizational culture (Denning, 2001; Orr, 1996). Besides, given the increasing uses – and misuses – of social media (e.g., Facebook, Youtube, Twitter, etc.) in our lives, managers should train employees to navigate social media more responsibly to avoid the pitfalls that could hurt their career.

## CRITICISMS AGAINST EVOLUTIONARY PSYCHOLOGY

EP as a research program has recently gained new momentum among scholars in MOS (e.g., Colarelli, 2003; Lawrence & Noria, 2002; Markoczy, 2003; Nicholson, 2000; Talbot, 2005). Business journals have begun to publish special issues on EP; for example, *Managerial and Decision Economics* (2006, guest edited by Satoshi Kanazawa), *Journal of Organizational Behavior* (2006, guest edited by Rod White and Nigel Nicholson), and *Ruffin Series in Business Ethics* (2004, guest edited by Edward Freeman and Patricia Werhane). However, a majority of researchers and scholars in MOS are still skeptical and even hostile toward EP. Most of their criticisms can be grouped into two categories – "lack of evidence," and "distal versus proximal explanation." The following passages are typical criticisms.

In a review of Nicholson's *Managing the human animal: Why people behave the way they do in corporate settings*, Thompson (2003) wrote:

> It is pointless to pretend that I approached this book with an open mind, hardwired as I am by a background in sociology and radical organization theory…. First, the quality of evidence is poor…. The second recurring problem, common to EP, is the preference for distal (or ultimate) over proximate explanation (Rose, 2000). So many of the things explained by Nicholson as the result of hardwiring of the brain through evolutionary adaptation could be explained more effectively by reference to specific institutional influences and social organization. (pp. 373 – 374)

A similar criticism has been put forward by an industrial psychologist. In his review of Colarelli's *No Best Way: An Evolutionary Perspective on Human Resource Management* (2003), Wilson (2004) criticized that:

> The central point of the book is that I-O [Industrial and Organizational Psychology] requires decision makers to act in ways that are not in agreement with how they evolved to behave and make decisions. I am sure our behavior evolved along with everything else, but unfortunately, behavior does not leave any fossils. The discussion of how humans behaved several thousand years ago will remain nothing more than speculation and has no place in a serious science of behavior until someone invents a time machine. (pp. 1098 – 1099)

Unpacking these vague criticisms, there appear to be three specific concerns: (1) the methods or scientific rigor used in EP is somehow lacking, and (2) inferences about human behavior in the (distant) past are unscientific speculation, and (3) the focus on ultimate rather than proximate

causes. These criticisms are banal. Nevertheless, let's consider them. Are the methods used in evolutionary psychology less "rigorous" than the methods used in other behavioral and social sciences? Scholarly articles with an evolutionary psychological framework are published in peer reviewed journals; and many EP-related articles appear in non-EP journals (e.g., *Psychological Science*); one would expect that editors hold authors to the same standards for methodology and evidence, regardless of theoretical perspective. Thus, what the critics of EP are in fact arguing is that articles with an evolutionary psychological framework be held to a *higher* standard of methodological rigor.

What about the inferences evolutionary psychologists make about human behavior in the distant past? Is this unscientific speculation? It would seem that anyone who makes such a criticism has not read much science. Many sciences make inferences about probable events in the past (without requiring a "time machine"). The most notable is the Big Bang theory of the origins of the universe (Linde, Linde, & Mezhlumian, 1994). Much of science involves inferences about what we cannot see; but given theoretically relevant evidence, reasonable inferences are plausible. Hunting and gathering and farming are clearly types of work behavior, and it is widely accepted that humans were hunter gatherers until about 10,000 years ago, when people in the Fertile Crescent area of Eurasia began using agriculture as a source of food (Bender, 1975).

Although we cannot directly observe behavior in the past, evolutionary psychologists, anthropologists, and evolutionary biologists (among others) use a toolkit of sound scientific methods to make inferences about human behavior in the distant past (Buss, 2008; Confer et al., 2010). These include using current analogues (existing hunter-gatherer groups and non-human primates), behavioral inferences from skeletal fossils (e.g., type of bone breakage or injury can indicate degree of big game hunting), artifacts (remains of tools and weapons provide evidence of craft skill and approaches to hunting and warfare), symbolic artifacts (e.g., aesthetic ornaments can provide clues to family life, rituals, status differentiation), and molecular evolution (the molecular clock and human mitochondrial molecular clock techniques, DNA analysis of bone fossils).

Furthermore, EP does not claim that Darwinian understanding of the human mind will explicate our hominid ancestors' mental traits with telling accuracy; in other words, "we do not possess a videotape of deep time that would reveal in precise detail all of the selective events over millions of years that have led to the current design of the human body and mind" (Confer et al., 2010, p. 122). Instead, EP focuses on the functional relationships between adaptive problems in our ancestral environment and psychological mechanisms to solve them (Cosmides et al., 1992). The on-going debates on the testability of evolutionary hypotheses might be attributed to inattention to a multiple-level analysis of EP framework (Buss, 1999). The prime goal of testing EP hypotheses is not to test evolution by natural selection which is a general level of EP principle. Instead, a testable hypothesis should be derived from a middle-level theory of evolution by natural selection which is broad enough to cover entire domains of psychological functioning. Then, empirically testable consequences of a hypothesized mental mechanism could be examined using standard psychological research methods (Buss, 1999; Kirkpatrick, 1999). Hence, a research strategy is conceivable when one grasps the hierarchical nature of evolutionary theorizing about the relationships among adaptive problems in the ancient environment,

psychological adaptations evolved to solve them, and their recurring effects in the current environment (Crawford, 1998).

Our evolved behavioral tendencies should also be interpreted in a more nuanced manner. The impacts of our evolved mind on the human resource management practices would be more subtle and be reinforced or inhibited depending on the nature of current environmental inputs or contingency under which the firm is embedded. While nepotism is morally prohibited and sanctioned in modern workplaces, for example, it is widely practiced in ethnic-minority owned small businesses (Meyer, 2002; Sanders & Nee, 1996). In other words, kin nepotism as an evolved instinct still works in certain economic niches (Salter, 2002).

The accusation that EP prefers ultimate (i.e., evolutionary payoff of a behavior through differential survival and reproductive success) to proximate (i.e., immediate cause of a behavior) explanation is also widely shared among EP critics. However, the ultimate and proximate explanations are not an either-or issue (Confer et al., 2010). Simply put, the ultimate explanation is no better than or "opposed" against the proximate explanation. One of the strengths of the evolutionary research program lies in its theoretical usefulness for helping us understand both the "why" (ultimate) and "how" (proximate) of a trait that has been selectively retained in our behavioral repertoire. If we do not have some understanding of distal causes, then our prescriptions based solely on proximal causes are likely to be misinformed; if our underlying assumptions are wrong, then proximal interventions won't work well. The better we understand the distal, the more effective our proximal interventions and understandings will be. For example, we now know that a proximal cause of alertness and sleep is a neuropeptide hormone, orexin (Mieda, Willie, Hara, Sinton, Sakurai, & Yanagisawa, 2004). Therefore, one might develop a medication (using orexin) to allow people to stay awake naturally for 24 hours, not perceiving any need for sleep. However, because this intervention is based strictly on a proximal cause, it ignores the function (ultimate cause) of sleep. If the function of sleep is to consolidate the day's experiences and learning, then manipulating the proximate mechanism for sleep may have the unintended consequence of producing people who cannot learn from experience.

## CONCLUSION

We have begun this paper by emphasizing the need for a valid and useful theory of human nature for MOS. We suggest that EP can meet the theoretical need if scholars in MOS are more open to evolutionary thinking. EP maybe is not the only lens through which we understand human nature. Yet, EP is firmly based on the scientifically valid theory of evolution by natural selection – a simple but powerful idea – proposed by Charles Darwin about one hundred and fifty years ago.

A biological understanding of our mind and social behavior is now very much a part of modern science. As more of the behavioral and social sciences embrace biological explanations (and this is occurring at a rapid rate), management and organizational behavior scholars, if they do not begin to acknowledge biological influences on behavior in organizations, will be increasingly marginalized in the scientific community. Furthermore, given the problems biological factors pose for organizations, scholars' limited efforts to incorporate biological understanding into the

field of MOS will only make matters worse. Ignoring biology will not make these problems go away, but will prolong them.

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