

Some potential contributions of sociobiology to moral psychology and moral education

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Abstract

Since Darwin's theory of evolution, subsequent studies of the theory, especially sociobiology, have had a deep and far-reaching influence on other disciplines including moral philosophy and moral psychology. For contemporary Darwinian theorists of human behavior, one of the most significant issues under debate is a question about the origin of human moral functioning. This study reviews current studies in sociobiology and its related fields that deal with human morality. In addition, based on an extensive literature review on the accumulated research in sociobiology, this study attempts to demonstrate the potential usefulness and applications of sociobiology in the field of moral psychology and moral education.

Key words: sociobiology, moral psychology, moral education, neurobiology, evolutionary psychology

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I . Introduction

Since Darwin's discovery of natural selection, evolution has become one of the fundamental tenets of biology. Moreover, it has also affected many other fields beyond biology, such as other natural sciences, social science, and even humanities. For instance, his idea has been imported into politics, leading some to differentiate between the Darwinian left and the traditional left (Singer, 1999). Indeed, Darwin's idea has started to permeate scholarly thinking on human behavior.

Contemporary biological scholars interested in evolutionary explanations of human behavior have insisted that the proper study of humanities or social sciences begin with an understanding of the human condition. Wilson (1978), for instance, argued that without evolution the humanities and social sciences are the limited descriptors of surface phenomena, like astronomy without physics, biology without chemistry, and mathematics without algebra. Thus, an increasing number of studies deals with the scientific elements of the human brain and moral functioning, reflecting the increasing scholarly tendency to approach human nature scientifically and attempt to develop a natural science-based understanding of the human mind, as is occurring in neurobiology and neuroimaging.

The goal of this article is, first, to expand and deepen our understanding of human moral functioning by examining the current sociobiological and neuroscientific thinking about human behavior. Second, it discusses the implications of sociobiology for moral education. To achieve these goals, this study begins with critical review of the sociobiological notion that social behavior can be approached biologically. In addition, several studies are described that have attempted to introduce sociobiology and other directly related disciplines including neurobiology and evolutionary psychology into moral psychology. Finally, in this paper we attempt to demonstrate the potential usefulness and applications of sociobiology in the field of moral psychology and moral education.

II. A brief review of sociobiology: An origin of altruistic behavior

Darwin believed the root of human morality was social instincts, such as the sense that one must ensure the survival of one's own family, and he would say that the fact that humans are biologically inclined to be sympathetic, altruistic, and moral would be an advantage in the struggle for existence (Darwin, 2006; Schroeder, 2006). Evolution by natural selection is perhaps the only one true law unique to biological systems (Wilson, 2006). Therefore, social factors—social instincts—are explained in terms of natural selection. This argument is represented by Social-Darwinism (Kaye, 1997).

Although Darwin's ideas have influenced a wide range of disciplines, such as Social-Darwinism, which even affected social sciences, the ideas have also been criticized, since they evoke the naturalistic fallacy that appeared in the work of Hume (1952)—the “is-ought” problem. The naturalistic fallacy is invoked when one infers that X is good from any proposition about X's natural properties. For instance, the naturalistic fallacy would apply if someone infers that drinking beer is good from the premise that drinking beer is pleasant (Moore and Baldwin 1993; Ridge 2008). Likewise, as Darwin's theory of evolution will evoke several fallacies when it is applied to normative arguments directly, it is not easy to apply it directly to moral psychology.

To mitigate the problems with classical evolutionary theories, sociobiology was introduced. Wilson avoids the naturalistic fallacy in sociobiology by not equating goodness with other natural properties such as pleasantness, as Darwin did (Schroeder, 2006). The term “sociobiology” refers to the new interdisciplinary field aiming to identify universally valid regularities in the social behavior of animals and humans. Its emphasis was imposed on the study of biology and is rooted in Darwin's legacy, becoming the branch of evolutionary biology that studies social behavior in all social species (Holcomb, 1993; Schroeder, 2006). Because scholars have highly criticized Darwin's

ideas because of its naturalistic fallacy, sociobiology has provided a new means to explain the biological origin and nature of human morality.

Sociobiologists claim that many social behaviors have been shaped by natural selection for reproductive success, and they attempt to reconstruct the evolutionary histories of particular behaviors or behavioral strategies (Holcomb & Byron, 2005). In fact, Wilson (1980) argued that the central theoretical problem of sociobiology stemmed from altruism. As a way to explain altruism within the framework of evolution by natural selection, he proposed the concept of kinship.

Wilson (1978) insisted that in many kinds of species, kin selection is an important part of natural selection. For example, a self-sacrificing soldier ant among white ants would protect its colony, including its parents, the queen and king. Over time, brothers and sisters that have stronger propagation power flourish, and through them altruistic genes proliferate. Applied to humankind, this kind of kinship could explain altruism.

But it is not enough to explain complex altruistic behaviors in humankind, since humans are altruistic not only toward family, but toward other people. Thus, more elements are required to explain this kind of altruism. To address this deficiency, some sociobiologists have tried to introduce another kind of model—reciprocal altruism based on tit-for-tat strategy. For instance, vampire bats share blood they have consumed with others that had previously shared blood with them. Likewise, monkeys, with their memory of experience of being helped by others, have a higher tendency to groom others when they have been groomed by others, even non-kin, themselves (Cheney & Seyfarth, 1992; Fehr & Fischbacher, 2003; Wilkinson, 1984). This kind of tit-for-tat reciprocity could explain some human reciprocal altruism. For small groups that extend beyond kin, this kind of reciprocity is a notion that has evolutionary robustness, stability, and initial viability with explanatory power for the origin of altruism in humankind (Axelrod & Hamilton, 1981). However, this explanation has limitations in humankind because our society is much bigger and more complex than

small groups, so we cannot easily expect to receive a reward from each person whom we have helped.

Thus, another model has been proposed by sociobiologists to explain altruism in humankind that can take into account complex and huge societies. Hawkes (1993) proposed a particularly helpful idea. He suggests that sharing food with others as a means of obtaining social benefit is better than the idea of direct reciprocity. The "Hadza tribe" served to illustrate his model. Hadza men share their meat with others to obtain social attention. If they receive social attention, they will earn a reputation for sharing. According to Hawkes (1993), Hadza hunters rely on reputation as a form of currency, thereby reducing the risk of relying on only one kind of money (meat). Alexander (1987) had explained this kind of reciprocity as a form of indirect reciprocity, meaning that humans gain and lose socially not only by direct transactions, but also by the reputations they gain from the everyday flow of social interactions. Indirect reciprocity is supported by several sociobiological studies such as image scoring in humans (Wedekind & Milinski, 2000), a mathematical model of indirect reciprocity with image scoring (Nowak & Sigmund, 1998, 2005), an observer tit-for-tat model (OTFT) based on vicarious observation of direct interaction (Pollock & Dugatkin, 1992), and a computational model of reputation and trust (Mui, Mohtashemi, & Halberstadt, 2002).

Those models try to confirm the argument that the evolutionary origin of altruistic behavior is related to morality based on emotion. Ridley (1996) showed that a worker ant seems to be sacrificing herself and denying self-interest in material gain; however, these models of altruism demonstrate that the worker ant is following her "selfish gene." Likewise, a person who behaves according to his/her emotion, rather than reason, seems to be sacrificing herself in the present, but in fact, her actions are selected because they will be of benefit to her in the long term. According to sociobiology, the gene involved in pursuing altruistic behavior enables its owner to survive, since it brought her benefits in the long term (Sober & Wilson, 1999; West et al.,

2007). In this way, sociobiological models of altruism have shown the possibility of survival of altruistic actors.

Scholars who have studied altruistic behavior from a sociobiological viewpoint have started to think that some aspects of moral emotions are simultaneously panhuman products of evolution. For example, Trivers (1971) and Haidt (2003) suggested that some emotions that can be directly related to morality, such as disgust and gratitude could have come from reciprocity in earlier stages of evolutionary development. They insisted that these kinds of emotions would have been transmitted from our ancestors through the process of evolution and reciprocal altruism (Joyce, 2006; Pizarro 2000; Pizarro & Bloom, 2003). Following this understanding, Frank (1988) explained the role of moral sentiments using the analogy of a gyroscope, arguing that moral sentiments that came from evolutionary processes predispose us to behave in certain ways, much as a spinning gyroscope is predisposed to maintain its initial orientation. Likewise, in sociobiological studies, emotions in morality have come about as the result of our evolutionary process.

These days, developments in the fields of neurobiology and neuroimaging are prompting the study of biological mechanisms of sociobiology explaining the origin of emotions related to moral thinking. One of the most popular studies is related to the function of the amygdala. Several studies have explained that the amygdala contributes to emotional behavior, especially fear. Moreover, it also plays a role in emotions associated with novelty and ambiguity, and anatomical studies from fMRI (functional Magnetic Resonance Imaging) and PET (Positron Emission Tomography) have illustrated widespread back projections from amygdala to early stages of sensory and perceptual processing (Davidson, 2000; Ledoux, 2002a; Whalen, 1998) and learning of emotion (Balleine & Killcross, 2006; Phelps, 2004). One experiment found that damage to the amygdala causes a loss of fear in primates and humans (Adolphs et al., 1999, 2005; Davis et al., 1991), and causes social emotions to be recognized more than basic emotions (Adolphs et al., 2002).

In sum sociobiologists have studied human and animal social

behaviors and have tried to establish generalized theories to explain the evolutionary mechanisms that originated these behaviors. In this process, many scholars have discovered various altruistic behaviors among diverse animal societies and how those types of behaviors would be helpful to survive in evolutionary terms, trying to explain the origin of human morality. More detailed results of several studies directly related to sociobiology and moral psychology will be discussed in the next section.

III. Introduction of sociobiology into moral psychology

Several attempts have been made to import the findings of sociobiology into moral psychology. Since the incipient evolutionary research performed by Darwin, some have tried to explain morality in terms of sociobiology. Darwin's evolutionary account of morality provides some idea of the origin of morality. First, Darwin believed that instinctive sympathy and moral sentiments are evolved behavioral dispositions that help ensure the survival of the individual and the group to which the individual belongs (Darwin, 2006). They are the evolutionary and naturalistic roots of morality derived from natural selection. Second, for Darwin, morality is transmitted to descendants through heredity. This transmission of moral tendencies ensures that virtuous tendencies are repeated and are deeply imprinted into our habits, and then transmitted for several generations. Eventually, in subsequent generations, those moral tendencies would appear as inborn virtues (Darwin, 2006; Sahakian, 1974). This would mean that human morality would be transmitted from predecessors and have several properties that are innate, inborn, and a priori.

In the past couple of decades, more sophisticated approaches by sociobiologists have been attempted. Darwin's idea was kind of primitive. With the advent of sociology, social scientists have tried to develop sophisticated models of human nature based on the evolutionary ideas of Darwin. As mentioned above,

sociobiologists who study altruistic behavior and reciprocity have established the evolutionary bases of human morality (Mui, 2002). Based on these ideas, more recently, moral psychologists have imported the findings of sociobiology into moral psychology, and some have tried to study human morality from the viewpoint of neurobiology.

From a sociobiological point of view, Wilson (1982) argued that ethical philosophers may study morality by consulting the emotive center of their own hypothalamic-limbic system. The human brain, sometimes allows us to make moral decision without consciousness or higher cognition. For example, reciprocal altruism and altruistic behavior start from multileveled genetic or group selection (Wilson, 1982). These ideas may be linked to natural, evolutionary approaches toward human morality and intuitional morality. In Wilson's view, ethical philosophers intuit the deontological canons of morality with the emotive center of their own "hypothalamic-limbic system" (Wilson, 1982). Since deontologists have similar brain systems and instincts as other humans, they may not be free from the evolutionary roots of emotive, unconscious, and intuitive center of moral thinking. Moreover, new findings in evolutionary fields have proposed that the origin of human morality can be found in a set of emotions that make individuals care about welfare of others as well as cooperation, cheating and norm-following (Greene & Haidt, 2002).

According to the evolutionary view, though humans have a greater degree of rule internalization, adaptation of the perspectives of others, and an ability to debate issues and transmit them verbally, it would seem to be moral systems which rely on basic mental capacities and social tendencies, such as sympathy, reciprocity, loyalty to the group and family, that nevertheless share with other primates (Flack & De Waal, 2000).

From a moral psychological viewpoint, Haidt (2007) has strived for a complete explanation of morality, including its evolutionary origins, brain basis, and cognitive mechanisms. In a paper, "The Emotional Dog and Its Rational Tail: A Social Intuitionist Approach to Moral Judgment," Haidt (2001) turned

the reason/emotion relationship upside down. In a more recent study, he summarized the new synthesis in moral psychology with four principles: (1) intuitive primacy but not dictatorship, (2) moral thinking is for social doing, (3) morality binds and builds, and (4) morality is about more than harm and fairness (Haidt, 2007). In his view, these principles link with evolutionary theory. At the center of his proposal is a model of social intuition that defines moral intuition as the sudden appearance in consciousness of a moral judgment, including an affective valence, without any conscious awareness of having gone through the steps of searching, weighing evidence, or inferring a conclusion (Haidt, 2001; Lapsley & Hill, 2008).

In addition, beginning a couple of decades ago, studies have emerged dealing with moral psychology from a neurobiological perspective. These studies are basically related to the emotional origins of human morality as explained by sociobiology. Thanks to rapid advancements in neurobiology, scientists have been able to directly investigate brain activity. For example, fMRI research conducted by Greene et al. (2001) has shown the presence of emotional engagement in moral judgment. In their study, responses of rationally appropriate but emotionally incongruent decisions in confronting dilemmatic situations were significantly slower than responses of rationally inappropriate but emotionally congruent decisions. This implies that when we make moral decisions, there may be more primitive and unconscious emotions intervening in the moral judgment process. This result can indicate that in the human process of moral decision making, there is a strong presence of elements outside of our consciousness and rationality, which can cause us to hesitate and sometimes exclude conscious, rational, or cognitive thinking processes.

In fact, one study of the amygdala shows that facial signals of fear engage dedicated neural systems, even in the absence of conscious detection (Williams et al., 2006). This suggests that fear reactions following trauma, are automatic and outside immediate conscious control. Moreover, from anatomical studies and observations, it seems that emotional components are

independent of higher cognition and conscious control mechanisms (Gazzaniga & LeDoux, 1981; LeDoux, 1986). These experimental results support Greene et al.'s (2001) study and their notions that strong elements of emotion are independent of our rationality or consciousness in human thinking.

These kinds of studies in neuroscience are helpful in strengthening our sociobiologically based understanding of moral psychology. Many neuroscientific studies on human moral thinking emphasize the role of emotions with long histories, as corroborated by sociobiology. Such studies have provided moral psychologists with novel viewpoints that did not exist in the traditional conception of moral psychology. These kinds of new sociobiological studies on the human condition and morality can inspire new ideas in moral psychology in determining what underlies our consciousnesses and reasons.

Although we have obtained various experimental results that expand our knowledge of human moral functioning, controversy has persisted. Against the views of sociobiologists and scholars who propose a scientific basis for human moral functioning, others hold strongly to the notion of human "free will" in moral functioning. Scholars in this camp insist that humans are different from animals and that the mechanisms of morality are also completely different and separate from natural first causes (Holcomb & Byron, 2005). For instance, scholars such as Campbell, assume that universal prohibitions fulfill the function of counteracting the natural, socially detrimental, biological tendencies of humankind, and that they are purely cultural in origin (Musschenga, 1984). According to this viewpoint, the alleged evolutionary basis of morality does not have a significant meaning in human moral functioning.

Cartwright (2000), on the other hand, answered that evolutionary psychology still has useful meaning. Even though our "nature" is set by genetic algorithm from our ancestors, since human behaviors are essentially the result of adaptations to circumstances, the possibility of change is pre-established in our nature, a kind of plasticity, through changes in conditions, in education and in nurturing (Braddock, 2009; Cartwright, 2000).

Evolutionary psychology can still be convincing and the pre-establishment of human nature that affects moral functioning can still be plausible. Therefore, a psychology derived from evolutionary studies can be compatible with our free will and moral ability, and seems to be useful in the study of moral psychology.

IV. Implications of sociobiology for moral education

Studies in sociobiology and its related fields have provided important lessons on emotional factors in moral psychology. Emotions have a long history in the evolution of humankind, and they do not require consciousness when working with moral dilemmas, which makes them powerful elements in moral thinking. To improve moral education in schools, we should concentrate upon lessons from sociobiological studies and apply their implications to school classes.

Wilson (1999) tried to apply studies of sociobiology to theories of moral psychology. For example, he tried to explain the Kohlbergian model with his own theory. He insisted that interpreting the activity of emotive centers as a biological adaptation can help us decipher the meaning of moral canons. By affirming this, he argued that moral development is only a more complicated and less tractable version of the genetic variance problem. Wilson presented several examples to explain the various Kohlbergian stages—for instance, the selective advantage for young children to be self-centered and relatively disinclined to perform altruistic acts based on personal principle (Stage 2), and the adolescents tendency to be more tightly bound by age-peer bonds within their own sex and hence hypersensitive to peer approval (Stage 3) (Kohlberg, 1981, 1984; Wilson, 1982). Wilson (1999) also argued strongly that normative-moral decision making can be fully analyzed and predicted by natural science.

Wilson tried to explain moral development in terms of sociobiology. However, sociobiology is criticized for being

essentially gene-deterministic, and for implying that the illusion of human freedom is in fact merely gene determinism (Peters, 2003). If we rely solely on sociobiology, as Wilson suggested in his connection of the sociobiological approach and developmental models in moral psychology, it would conflict with basic idea of moral education. Moral psychologists have believed that intentional educational intervention can lead to moral development of both reasoning and emotion (Gibbs, 2002; Lapsley, 1996). But if we uncritically adopt a sociobiological approach, the possibility of moral education is believed to diminish. It is because many aspects of moral development would be explained by innate properties rather than intentional invention. In response to this presumed impasse, several remedies of the proper relationship between sociobiology and moral education can be proposed.

One remedy is based on the plasticity of synaptic structures that is an important concept in modern biology. Although many sociobiological studies have shown that the strong association between emotions and moral thinking has been with us for very long periods of evolutionary history, emotional (e.g., fear) circuits in the human brain can be affected by external conditioning with its synaptic mechanism. Molecular biologists and neurobiologists have insisted on the plasticity of the synaptic mechanism of the human circuit (Gallagher & Holland, 1994; Ledoux, 2002b; Maren, 2005; Rodrigues et al., 2004; Rumpel et al., 2005). This implies that conditioning or learning could affect even the molecular level of the amygdala and other emotional circuits. Although the basis of emotional operations and its plasticity to the possibility of learning in our brain could come from long period of evolution, the concrete working of the circuit is affected most strongly by postnatal learning and by environmental factors.

In contemporary theories of moral psychology and education, several scholars have noted the importance of emotion in the moral process and have proposed educational methods to improve emotions. One paradigm in moral psychology that emphasizes the integration of emotion into moral functioning is proposed by Kristjansson (2009). Kristjansson indicates that the

“emotional self” is imbued with and constituted by emotions and plays an important role in moral functioning and education. Within the paradigm, Kristjansson argues that our moral character is well understood in terms of dispositional emotional reactions. Moreover, in the model, self-change is enacted via an emotion-driven search for objective truth rather than cognitive processes, and the importance of emotional or sentimental educational methodology in moral education is stressed.

In addition, within the same context, various educational innovations have attempted to develop students’ moral emotion and sentiment. From Darwin’s exploration of the importance of emotion in evolution, several scholars have proposed the idea of “Social and Emotional Learning (SEL)” and have tried to apply it to moral education. SEL is a process for helping youths develop the fundamental skills for life effectiveness and for managing themselves, their relationships, and their work more effectively and ethically. It includes recognizing and managing emotions, developing care and concern for others, establishing positive relationships, making responsible decisions, and handling challenging situations constructively and ethically (CASEL, 2010a). Scholars who support SEL mention that SEL competencies are required to attain desirable moral characteristics. So they argue that schools should create environments in which SEL can be induced—such as Caring School Community, Responsive Classroom, SOAR (Skills, Opportunity, and Recognition), and Tribes Learning Communities—and other supportive contexts that can lead to inculcating assertiveness, reducing risk, enhancing behaviors, and involving and investing oneself more fully in school (CASEL, 2010b; Elias et al., 2008).

The trend that introduces the theories of emotions into moral psychology is helpful in understanding human moral behavior, because emotions, rational judgment, and behavior are all closely related. From an evolutionary psychological perspective, at the beginning of the evolutionary sequence leading to the development in humans of individual and group moral codes, there were primitive actions, leading to the development of a primitive repertoire of behaviors associated

with the emotions (Allott, 1991). Drawing on research in primatology, neurology, anthropology, and psychology, Haidt (2003) suggests that moral judgment involves quick gut feelings, or affectively laden intuitions that then trigger moral reasoning as an ex post facto social product. Thus, throughout evolutionary history moral-related emotions have greatly affected moral reasoning and final behavior. Therefore, studying evolutionary psychology can expand our knowledge not only of moral emotions, but also of the mechanisms of moral judgment and behavior.

Research in biology and neuroscience that tried to determine the chemical and material basis of emotional learning that occurs in the brain would be meaningful to the study of moral psychology and could lead to more effective methodologies in moral education. However, since there are numerous technical limitations that restrict the investigation of the molecular structure of our brains and the discovery of its internal mechanisms that control emotional learning in actual time, scientists have not been able to identify a sophisticated learning mechanism for various emotions. In fact, recent research has primarily focused on the molecular brain mechanisms of fear and other kinds of basic emotion learning processes in mammals. For example, Maren (1999) investigated a gene-manipulated mouse, and found that calcium and its receptor in the amygdala, the hippocampus, and the striatum affects long-term potentiation in the amygdala, which is a mechanism for emotional learning and memory. Moreover, Xia et al. (2005) stated that molecular-genetic tools to generate genomic mutations in NMDA receptors for Pavlovian olfactory learning have shown acute involvement in associative learning and memory.

Although recent research has been limited to studying simple, basic emotion learning mechanisms, with advancements in methodologies for brain investigation and evolutionary simulations, in the future, we may discover convincing mechanisms of learning for more complex, sophisticated and high-level emotions that can be directly applicable to improving methods of moral education in classrooms and in society. For

instance, we may use fMRI to discover the kinds of educational interventions that can induce significant development in moral functioning by investigating numerous students with the tool. We could discover what kind of educational intervention can induce significant change in that part of the human brain that is related to evolved moral emotion.

We can also simulate the result of the moral psychological process or the effects of educational interventions on human moral emotion and functioning by using evolutionary algorithms. Evolutionary algorithms use the fitness function to obtain candidate solutions and subsequent offspring. In this algorithm, parents of the next generation are chosen with a bias towards higher fitness, and then the fittest form survives and we are able to arrive at the proper solution. With this algorithm, we can determine the most suitable solution from a multi-object problem in simulated circumstances. Programmers can apply genetic algorithms that induce mutations and randomness in the evolutionary process (Fonseca & Fleming, 1995; Poli et al., 2008). Moral psychologists and educators may assess and simulate the anticipated effects of educational interventions or adjustment in circumstances, as these methodologies directly adopt the basic mechanisms of evolution and adapt them to the evolution of moral emotion to determine which individual has then kind of moral emotion that can survive in the long term.

V. Conclusion

Human evolutionary studies offer various implications for moral psychology and its applicability to educational environments. However, many have also criticized this approach, noting that the radical views of some sociologists and natural scientists on human morality can be problematic. For instance, Singer (1981) has criticized the sociobiological argument presented by Wilson et al. His criticism is based on the issue of the naturalistic fallacy as we discussed in the previous section. Moreover, he has insisted that even if we can be knowledgeable

enough about human emotion and the human mind that we could perfectly predict our decisions and behaviors, we are capable of refuting any prediction of which we become aware. Likewise, Trigg (1982) argued that while the way the brain works and filters information may be the result of evolution, what man thinks lies beyond the scope of biological explanation. In his view, there are aspects that extend beyond the ability of evolutionary theory to explain moral decision making and behaviors.

To cope with these lingering challenges, sociobiologists have developed several explanations to bulwark the weak points of sociobiology. Dawkins (1999), for instance, has insisted that the human is the only species that can disobey the "selfish gene" from evolution, and as an alternative explanation for humankind, he suggested the concept of "memes" which are duplicators of culture. Because of the existence of memes, people can transmit their cultural properties that could be opposite to the gene based on evolutionary process. This idea inspires a cultural evolution framework of morality (Mesoudi & Danielson, 2008).

We conclude that in order to avoid the problem of the naturalistic fallacy as one of the most challenging problems for sociobiology and its related fields that deal with human morality, further studies to apply natural sciences to moral psychology should focus on descriptive, pragmatic problems, not on normative issues. This means that scholars should mainly concentrate upon how to develop more sophisticated frameworks of human moral functioning with results of evolutionary studies, rather than trying to find ways to justify ethical norms from evolutionary processes. If further studies are aware of these problems, then they can yield meaningful results to improve our knowledge of the most sophisticated mechanism and root of moral functioning, and how to more effectively educate students to be moral.

Received in 30th September, 2010

Reviewed in 19th November, 2010

Revised version received in 17th December, 2010

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