CHAPTER THIRTEEN

The Basic Components of the Human Mind Were Solidified During the Pleistocene Epoch

Valerie G. Starratt and Todd Shackelford

The basic components of the human mind, i.e., evolved psychological mechanisms, were solidified during the Pleistocene Epoch. The Pleistocene is the time period between 1.8 million years ago and 10,000 years ago that included the environmental selection pressures (both internal and external) that are responsible for the evolution of human psychological mechanisms. Although we share some psychological mechanisms with our pre-hominid ancestors—such as those that motivate predator avoidance behaviors—these mechanisms could not have "solidified" before the arrival of our hominid ancestors. Humans continue to be subject to natural selection. However, because the time between the end of the Pleistocene and today is such a small portion of human existence (one half of 1%), it is unlikely that evolution has altered human design greatly over the last 10,000 years.

1 Introduction

The basic components of the human mind were solidified during the Pleistocene Epoch. Before discussing this further, however, we will clarify our definition of the key terms. First, we interpret "the basic components of the human mind" to be the varied and numerous psychological mechanisms that evolved to solve specific adaptive problems. An adaptive problem is any hindrance to survival or reproduction that occurred repeatedly throughout our ancestral history. These adaptive problems included, but are not limited to, pressures to evade predators, pressures to capture prey, and pressures to out-compete same-sex rivals for access to the most desirable mates. One example of an adaptive problem is the need for nutritious food. Ancestral humans who could not successfully identify nutritious foods would have been at a disadvantage relative to those who had a diet of more calorically dense foods. Psychological mechanisms are the responses that function to solve adaptive problems such as this. Psychological mechanisms include information-processing mechanisms and internal motivations that work in conjunction with internal and external stimuli to produce behavior. Continuing with the example of the need for nutritious food, the associated psychological mechanisms include the preference for high-calorie foods (i.e., foods containing relatively large amounts of fats and sugars). Individuals who preferred to eat foods with high fat and sugar contents gained survival and reproductive advantage over those who did not.

Second, we address the Pleistocene Epoch. This covers the time period from about 1.8 million years ago to a little more than 10,000 years ago. This time period is most relevant to the current discussion because of its association with the Environment of Evolutionary Adaptedness (EEA). The EEA is not a place or a time in history, but a statistical composite of the selection pressures (i.e., all environmental characteristics influencing the ability of individuals of a species to survive and reproduce) operating on the adaptations that characterize a species' ancestral past (Tooby & Cosmides, 1990). Each adaptation has its own specific EEA, but there is likely to be overlap in the EEAs of similar adaptations within the same organism. The Pleistocene is the period of time hypothesized to contain the EEAs of the majority of human-specific adaptations. The early Pleistocene was the period of time during which the genus *Homo*, of which modern humans are the only remaining species, first appeared. If humans appeared no earlier than 1.8 million years ago, then adaptations specific to the human mind could have evolved no earlier than that.

Third, we address the solidification of these psychological mechanisms. Although we argue that psychological mechanisms were solidified during the EEA, we do not believe that the evolution of human psychology is fully contained between 1.8 million years ago and 10,000 years ago. Many psychological adaptations, such as those that motivate predator avoidance, are likely to have evolved in our pre-hominid ancestors, then perhaps sharpened in our hominid ancestors to motivate avoidance of predators that targeted them. In much the same manner, we do not support the argument that evolution stopped 10,000 years ago. Humans continue to be subject to natural selection. However, that is not contrary to our argument that most of our psychological mechanisms evolved during the Pleistocene and continue to be expressed today. In the evolutionary history of humans, 10,000 years is a brief period of time—roughly one half of 1% of the 1.8 million years of human existence. Additionally, geneticists investigating human genetic diversity report that 80% of all genetic differences are among individuals within the same population. In contrast, variations among populations of different continents account for only about 10% of all genetic differences. This suggests that most genetic variation occurred before modern humans migrated out of Africa roughly 100,000 years ago (see Owens & King, 1999, for a brief overview). If the bulk of our species' genetic makeup has remained relatively constant over the last 100,000 years, it is not unreasonable to argue that our psychological design (which is built by our genes) has remained relatively constant over the last 10,000 years.

This argument should not be misinterpreted to mean that, because psychological mechanisms were solidified hundreds of thousands of years ago, modern human cognition mirrors that of our ancestors. For instance, our ancestral environment did not contain selection pressures for performing calculus or geometry. However, because humans today are capable of such higher-level analytical reasoning does not mean that there is a psychological mechanism devoted to geometry. Most likely the ability to perform such reasoning results from a parasitization of the evolved mechanisms that provide the ability to perform other, evolutionarily relevant reasoning and cognitions, such as tracking prey through dangerous terrain or successfully maneuvering tricky social situations.

2 Evolution

Evolution by natural selection is the only known scientifically viable process capable of producing the complex construction of the human body and brain (see Dawkins, 1986). Natural selection is the process that acts on characteristics in a population in the presence of the following necessary circumstances: variation, heredity, and intra-species competition resulting in differential reproduction (Darwin, 1859, 1871; Mayr, 1982). First, a characteristic must exist in varied forms within the target population. Second, that characteristic must also be subject to heredity—have a genetic basis that can be transmitted from parent to offspring. The third specification is that the characteristic must be differentially beneficial, such that some variations better aid survival and reproduction compared to other variations. Individuals within the population who display the relatively more beneficial variations of that characteristic will out-reproduce those with other variations. Subsequently, the relatively more beneficial variations will be more likely to be spread throughout the species.

Darwin (1871) originally distinguished sexual selection from natural selection in an attempt to explain the existence of reliably developing characteristics in some species that appeared to hinder survival (most notably, the peacock's tail). Sexual selection is concerned with reproduction, rather than survival. There are two components to sexual selection: intrasexual competition and intersexual competition. *Intrasexual* competition involves competition among members of the same sex for access to the most desirable mates. In several deer species, for example, large antlers allow males to intimidate and physically compete against one another for social dominance, access to resources, and sexual access to the most desired females (e.g., Bowyer, 1986; Kucera, 1978). *Intersexual* competition, on the other hand, refers to differential mate choice of members of the opposite sex. For example, the large and vibrant peacock's tail is a hindrance to survival. It is an impediment when escaping predators, an obstacle when stalking prey, and physiologically costly to build and maintain. However, it is incomparably helpful when attempting to attract a mate. Peahens are most attracted to peacocks with the most impressive plumage and, so, grant sexual access to these high-quality peacocks over those with less impressive trains (e.g., Petrie & Halliday, 1994; Petrie, Halliday, & Sanders, 1991). Here we present natural selection and sexual selection as two separate entities, but today both processes are often categorized under the term natural selection.

Evolutionary psychologists often speak of natural selection as responsible for "designing" the mind. This can be an unfortunate short-hand, as it is often misinterpreted as implying that natural selection acts with intent. Evolution, however, has no intent. Genes cannot see into the future to determine what will be beneficial later. The selection pressures that act on organisms are not a unidirectional force pushing organisms from point A (amoeba) to point B (human). Rather, selection pressures are a conglomeration of all the forces acting on an organism that impact the organism's survival or reproduction. These can include pressures to evade predators, pressures to capture prey, pressures to out-compete same sex rivals for access to the most desirable mates, or pressures from any number of other sources. Evolution is not deliberate in that it is not forcing organisms down a pre-determined path of species development. The genetic mutations that produce variations in the traits that they build occur randomly. It is just as likely that random mutation produces a gene coding for immunity to cancer as a gene coding for faster-growing fingernails. The process through which some mutations survive natural selection and become part of the genotype that builds adaptations, however, is non-random. An individual whose genes build adaptations that produce immunity to cancer gains a significant advantage in survival and reproduction. It is likely that an individual with quickly growing fingernails shares no such advantage. Only those random mutations which lead to beneficial adaptations are consistently selected for and are spread throughout the species.

There are three distinct products of evolution by natural selection: adaptations, by-products, and noise. An adaptation is an inherited characteristic that reliably develops within a species and functions to solve a particular adaptive problem (Buss, Haselton, Shackelford, Bleske, & Wakefield, 1998; Thornhill, 1997; Tooby & Cosmides, 1990). An example of a *physical adaptation* is the umbilical cord. It is species-typical (i.e., reliably developing in all members of a species) and serves the necessary function of transferring nutrients from a mother to her fetus. *By-products* do not serve a particular adaptive function, but exist as a direct result of an adaptation. An associated by-product of the aforementioned adaptation would be the belly button. It serves no function, but occurs as a direct result of the necessary umbilical cord. *Noise* is random variation that exists within a population. It does not aid in survival or reproduction and is not directly associated with an adaptation. The shape of the navel represents noise. The particular shape of one's navel serves no function and is not directly related to any adaptation.

3 Evolutionary Psychology

Evolutionary psychologists attempt to understand human behavior by identifying how humans lived during ancestral times and the adaptive problems they were likely to face. Critics of evolutionary psychology argue that it is impossible to know how early humans lived, so how can we possibly know what types of problems they faced? It is true that we cannot know all of the specifics of ancestral life. However, there are several aspects of ancestral life of which we can be certain. For instance, we can be certain that ancestral humans breathed oxygen and were subject to the laws of gravity. We can also be certain that ancestral women, and not men, bore children. This one fact alone underscores several theories of human behavior. One of the most influential theories to develop from this fact is the theory of parental investment (Trivers, 1972). Given the biology of human reproduction, women are required to invest significantly more in the production of offspring than are men. At the very least, a woman must devote nine months to gestation and often several years of lactation and constant care to ensure the survival of one child. A man, on the other hand, need invest little more than an ejaculate. Because of the relatively large parental investment required of a woman and the relatively small number of possible offspring produced throughout her life, her best interest may lie in careful selection of a mate who is willing and able to provide resources for her and her offspring, thereby increasing the likelihood of each offspring's survival. As such, women should demonstrate a preference for high-status men with sufficient access to resources who appear willing to share those resources with her and her children. A man, on the other hand, is not limited by such restrictions. Should a man have sex with 100 different women, he has the possibility of siring 100 different offspring. Consequently, his best reproductive interest may lie in attracting as many mates as possible. This could be demonstrated by a willingness to engage in casual sex with a wide variety of women. There is a large body of evidence supporting the existence of these sex-differentiated mating strategies (Buss, 2003).

Evolutionary psychologists investigate psychological adaptations. Psychological adaptations, often referred to as evolved psychological mechanisms (EPMs), have the following characteristics:

1. An EPM exists as it does because it solved a recurrent adaptive problem.
2. An EPM processes only the specific stimuli relevant to the particular adaptive problem it evolved to solve.
3. An EPM makes the organism aware of the particular problem it is facing.
4. The input received by an EPM is transformed into output via decision rules.
5. The output produced by an EPM can be physiological activity, information that becomes input to another EPM, or manifest behavior.
6. The output is directed to the solution of the specific adaptive problem that EPM functions to solve (Buss, 2005).

In the venue of evolutionary psychology, adaptations do not refer to the behaviors themselves. Rather, the adaptations are the psychological mechanisms: the biases that motivate individuals to perform certain behaviors that, in turn, served as solutions to adaptive problems.

Consider, for a comparative example, the physical adaptation of the human eye. The human eye evolved to be sensitive to a particular type of stimuli: light waves that fall in the visual spectrum. The human eye does not attend to, or respond to, other types of stimuli, such as smells or even light waves that fall outside of the visual spectrum (e.g., infrared waves). Our eyes respond to light waves, and not smell, for much the same reason as our hearts pump blood instead of pumping blood *and* storing waste. One system performs one function. Our eyes respond to light waves instead of infrared waves because the stimuli most relevant to our survival and reproduction reside in that spectrum.

The human mind works in much the same way. There is a vast store of internal and external stimuli available to the mind. However, it would be impractical, if not impossible, for each part of one's mind to attend to all stimuli at once. Consequently, in much the same way as the human eye focuses solely on light waves, so do the individual components of the human mind focus on particular sets of stimuli. The psychological mechanism that generates fear, for instance, responds only to fear-relevant stimuli. If you come across a snake lying in your path, the stimuli associated with that snake will be processed by the psychological mechanism responsible for fear-related stimuli. This psychological mechanism, then, will motivate any of a number of responses. Your physiological responses may include a change in heart rate, breathing pattern, and diversion of physiological resources from digestion to muscle contractions. Your psychological responses may include an urge to run away or an unwillingness to move. It is likely, however, that you do not feel the desire to mate with the snake. This is because snake-relevant information is processed by the psychological mechanism that evolved to solve problems associated with escaping organisms that could cause bodily harm, and *not* by the psychological mechanism that evolved to solve problems of mate selection.

But how do we know that fear is produced by an evolved psychological mechanism? Mineka and Öhman (2002) present four characteristics of fear that indicate it is produced by an evolved psychological mechanism. First, fear is most likely to be associated with stimuli that would have been ancestrally dangerous, such as snakes, spiders, and heights. This is not to imply that fear of a particular object or situation occurs in the absence of any learning. However, people appear to be more prepared to learn fear of ancestrally dangerous stimuli than evolutionarily novel stimuli. It is easier and quicker to condition fear in response to snakes, for instance, than to cars or damaged electrical outlets, even though all three items are considered dangerous in today's environment. Second, fear occurs automatically, that is, without the need for conscious processing. This automaticity, however, has only been demonstrated in response to fear-relevant stimuli. The psychological mechanism that produces fear is not automatically activated in response to kittens, but can be automatically activated by spiders. Third, fear appears to be disconnected from higher-level conscious thought. An individual who fears spiders may understand consciously that a picture of a spider can cause no harm. However, this does not prevent the activation of a fear response. Finally, neurological research has demonstrated that the neural mechanism responsible for fear is seated in the amygdale, an evolutionarily old part of the brain that is shared with other mammals. These neural mechanisms also appear separated from neural mechanisms associated with learning material that is unassociated with fear.

Fear also exhibits the characteristics Buss (2005) describes as being true of all psychological mechanisms:

- *Characteristic 1: An EPM exists as it does because it solved a recurrent adaptive problem.* The fear of snakes helped to solve the recurrent adaptive problem of avoiding an animal that is potentially harmful or lethal.
- *Characteristic 2: An EPM processes only the specific stimuli relevant to the particular adaptive problem it evolved to solve.* When you encounter a snake, the fear mechanism is devoted to processing the information relevant to the snake. This information may include the size and shape of the animal, the nature of its movements, and its distance from you. The color of the flowers on the bush next to the snake, however, is not information relevant to the problem at hand and, so, is not likely to be processed in the same manner.
- *Characteristic 3: An EPM makes the organism aware of the particular problem it is facing.* Fear of the snake draws your attention toward the snake. It would be unproductive to direct your attention to irrelevant stimuli, such as the color of those flowers, while still in the presence of potential dangers associated with the snake.

- *Characteristic 4: The input received by an EPM is transformed into output via decision rules.* Encountering a snake does not produce the same response regardless of the situation. Rather, the input of seeing the snake may pass through any one of a number of decision rules, such as "if the snake appears disturbed by your presence and looks as though it may strike, then run in the opposite direction" or "if the snake is very small and does not appear as though it can harm you, then continue along the path."
- *Characteristic 5: The output produced by an EPM can be physiological activity, information that becomes input to another EPM, or manifest behavior.* Physiological responses to seeing a snake may include a change in heart rate, breathing pattern, diversion of physiological resources from digestion to muscle contractions, or any number of other responses designed to facilitate either fight or flight from the situation. If the snake is deemed non-harmful, then the information may be passed to another EPM. For instance, if it is determined that the snake is not harmful, and you are hungry, then it may be deemed a good dinner. The relevant information would then be passed to the EPM designated to solve the adaptive problem of food acquisition.
- *Characteristic 6: The output is directed to the solution of the specific adaptive problem that EPM functions to solve.* Suppose that the decision rules associated with encountering a snake determined that a behavioral response is warranted. What is a more beneficial response, to run as fast as I can in the opposite direction, or to sneeze? Running in the opposite direction would function to remove me from the dangerous situation, thus solving my problem. Sneezing, on the other hand, most likely would do nothing to help my situation.

4 Ultimate vs. Proximate Causes of Behavior

Some critics argue that evolutionary psychology focuses too much on the ultimate causes of behavior, as opposed to the proximate causes of behavior. *Ultimate* causes of behavior are those defined by the adaptations addressing the adaptive problems facing our ancestors. For instance, an ultimate explanation for why you ate that double cheeseburger for lunch may be that your ancestors preferred foods that were rich in fat and, so, out-reproduced others who preferred less calorically dense foods. *Proximate* causes of behavior refer to the present environment in which the behavior occurs. Maybe you ate that cheeseburger because you were hungry, and you happened to walk by a restaurant that serves cheeseburgers. An evolutionary psychological perspective, however, would then beg the question of why that cheeseburger existed in the first place? That cheeseburger existed because at some point someone realized that people preferred to eat, and would spend money on, fatty foods over other available foods. Why do people prefer to eat fatty foods? Because over human evolutionary history, individuals who preferred high-calorie foods were more likely to survive and reproduce.

We do not argue that ultimate causes of behavior are the only causes of behavior. Rather, we argue that proximal causes *are not* the only causes of behavior. Ultimate causes of behavior are responsible for people's inherent biases. Proximal causes of behavior serve as the catalysts that trigger those biases to motivate certain behaviors. If the only causes of behavior were ultimate causes, then (ridiculous) logic would follow that certain human behavior would occur in the absence of any environment. Suppose a man exists in a void: a place of nothingness where there is no environment with which he can interact. Would that man spend his days pantomiming behaviors such as eating and mating, even if there were no food to eat and no women with whom he could mate? If ultimate causes of behavior are the only causes of behavior, the answer would have to be an absurd yes.

The flip side of that argument is that proximate causes are the only causes of behavior. If evolution played no part in the development of adaptations and subsequent behaviors, then all human behaviors would be learned via socialization or trial and error, and all behavior would be motivated solely by the current environment and past personal experience. We are what we are because of what we are taught. But if this were true, how would it explain phenomena such as a two-month-old child's preference for attractive faces over less attractive faces (Langlois et al., 1987)? Is the first two months of life sufficient to learn and develop a preference for social conventions of beauty?

If neither of the above extremes appears sufficient to explain human behavior, then there must be some integral interplay between evolved mechanisms and contemporary environments. Again, consider the example of the human eye. The structure and capabilities of the eye itself are a result of the evolutionary history of the stimuli presented to it. Today, our eyes are sensitive to light waves because that is what was most beneficial to our ancestors. However, individually, our eyes see what they see based upon our own current environment. We see what is in front of us at the moment. Our retinas are not burned with the images presented to our ancestors. The same is true of psychological mechanisms. Different components of the human mind evolved to attend to particular stimuli that were especially relevant to solving particular problems facing our ancestors. However, the output of those mechanisms is not staunchly predetermined. Obviously, behavior is heavily reliant upon the current environment.

A related argument is that adaptations and the environment cannot be separated as distinct entities. Adaptations exist as they do as a direct result of past environments. The available stimuli supported the development of adaptations that attended to and solved problems associated with those stimuli. As a result, those stimuli became more salient to the organism and a larger factor in the surrounding environment. Thus, environments today exist as they do as a direct result of adaptive mechanisms. Environments and adaptive mechanisms are so heavily reliant upon each other that they cannot be rightly separated (Cronin, 2005).

It has been argued that an evolutionary psychological approach is ill-equipped to address the question of how multiple proximate causes can account for any given behavior (Downes, 2005). A proper understanding of the interplay between psychological mechanisms (ultimate causes of behavior) and the environment (proximal causes of behavior), however, belies this as a problem. Psychological mechanisms act as a set of decision rules for interpreting stimuli associated with an adaptive problem and motivating behavior according to what has been beneficial ancestrally in solving that problem. Let us address the particular example used by Downes (2005). A prominent adaptive problem is that of mate selection, or identifying and successfully attracting a member of the opposite sex for the purposes of reproduction. Three separate hypotheses (in addition to several others) have been proposed to address the issue of how human males select high-quality mates: waist-to-hip ratio, fluctuating asymmetry, and chemical signaling.

Singh (1993) reported that body fat distribution in women, as measured by waist-to-hip ratio (WHR), is correlated significantly with youthfulness, reproductive status, and long-term health risk. Men seem to have an evolved mechanism for attending to this information and preferring predictable variations, as they report women with low WHR (0.7), compared to women with higher WHR (0.8 to 1.0), as more attractive, healthier, and of greater reproductive value. Singh argues that WHR serves as a cue to men in solving the adaptive problem of mate selection.

A second purported cue to mate selection is fluctuating asymmetry (FA). Bilateral symmetry is hypothesized to be a marker of low parasite load, resistance to environmental stressors, and overall "good genes" (e.g., Gangestad & Simpson, 2000; Thornhill & Møller, 1997). As such, recognition of, and preference for, potential mates with low FA should be reproductively beneficial. Grammer and Thornhill (1994), for example, reported that when presented with computer-generated faces manipulated to display varying levels of FA, men reported that the female faces demonstrating low FA were more attractive and sexy. So, FA also appears to serve the function of mate selection.

The third mate selection tactic is chemical signaling. Major histocompatibility (MHC) genes are important for immune system functioning and benefit from being paired with dissimilar MHC genes. As such, an individual whose mate is MHC-incompatible (i.e., had MHC genes different from his or her own) would be more likely to produce offspring with stronger immune systems and a higher likelihood of survival. Consequently, one would expect a preference for mates with incompatible MHC genes. Wedekind, Seebeck, Bettens, and Paepke (1995) reported just that. Individuals preferred the odors, a cue to MHC genes, of opposite-sex individuals with incompatible MHC genes.

Evolutionary psychologists have proposed three separate proximate causes—WHR, FA, and chemical signaling—to account for one set of behaviors, mate selection. The question has therefore been posed: How is one mechanism to account for three distinct causes of behavior? Surely an individual who could rely on more than one piece of information would be at an advantage over one who had to rely on a sole source. Consider the cue of MHC genes in men's mate selection. The psychological mechanism may employ a decision rule such as "If odor indicates that MHC is incompatible, then consider as potential mate." Now suppose that same system also could process information about female WHR, a separate cue to mate value. The decision rule may then be "If MHC is incompatible, but WHR is too high, then discount as potential mate." Both WHR and MHC compatibility could serve as cues to mate value. Singh (1993) reported a similar phenomenon in the investigation of WHR described above in including female body mass index (BMI) as a separate indicator of female health and fertility. In Singh's data, men preferred women with low WHR, but preferred women of normal weight over underweight or overweight women, regardless of WHR. It appears that both WHR and BMI are cues to selecting a mate, with BMI "trumping" WHR. It is not unreasonable to propose that such decision rules may affect human behavior in this manner. Consider the following analogy: If the most disconcerting thing in your present environment is the ant crawling on your knee, then attend to the ant on your knee. If, however, while attending to the ant on your knee, a tiger lunges at you from behind a boulder, then attend to the tiger.

5 An Example of an Evolved Psychological Mechanism Solidified During the Pleistocene Epoch

Interpreting human behavior in terms of the adaptive problems those behaviors solve can add insight into behaviors that would otherwise be difficult to interpret via proximate causes alone. For instance, recent research in the field of evolutionary psychology has focused on sperm competition in humans. Sperm competition occurs when the sperm of two or more males concurrently occupy a female's reproductive tract. There is an extensive literature supporting sperm competition theory in non-human animals such as birds and insects. Recent research has also lent support to the theory of sperm competition in humans. Shackelford et al. (2002) provided the first empirical evidence of male psychological adaptations to sperm competition in humans. They reported that men at a greater risk of sperm competition (as measured by proportion of time spent apart from their partners since last sexual intercourse), compared to men at a lesser risk of sperm competition, display motivations that would have functioned to increase the probability of success in sperm competition. Specifically, these men reported that they found their partners to be more attractive, they expressed greater interest in copulating with their partners, they believed that other men found their partners more attractive, and they believed their partners were more sexually interested in them. Shackelford, Goetz, McKibbin, and Starratt (2007) reported that men at a greater risk of sperm competition, compared to men at a lesser risk of sperm competition, display motivations that would have functioned to increase the probability of success in sperm competition. Specifically, men who spent a greater proportion of time apart from their partners (compared to men who spent less time apart from their partners) reported greater sexual interest in their partners, greater distress in response to their partners' sexual rejection, and greater sexual persistence in response to their partners' sexual rejection.

The researchers suggest that this is because the men who spend a greater proportion of time apart from their partners are at an increased risk of partner infidelity and subsequent sperm competition and cuckoldry (investing unwittingly in offspring that they have not sired). Men at a greater risk for sperm competition who exhibit these behaviors (e.g., greater sexual interest in their partners) are more likely to have sex with their partners sooner, thus entering their sperm into competition with possible rival sperm. An alternative explanation would be that these men are more interested in having sex with their partners as a result of a general sexual frustration. Because both studies found these partner-directed motivations to be unrelated to the total time since the couple last had sex, however, this alternative hypothesis remains unsupported. At this point, we are unaware of any supported theory, other than sperm competition, that can parsimoniously account for these adaptive patterned behaviors (for a comprehensive review of human sperm competition, see Shackelford & Pound, 2006).

6 Summary

This chapter provides a brief overview of the role that evolution plays in current human behavior. Evolution by natural selection shaped the development of species-typical psychological mechanisms. Those psychological mechanisms attend to stimuli specific to the adaptive problems of our ancestors and motivate behaviors that function to solve those adaptive problems. The specific nature of these behaviors is inextricably linked to both the environments of our ancestors and our own current environment. The specific nature of the psychological mechanisms themselves, however, is the result of the environments of our ancestors, and has been influenced very little by novel environmental factors emerging within the last 10,000 years.

Postscript: Counterpoint

The basic components of the human mind, or evolved psychological mechanisms, evolved to solve the numerous and specific problems of survival and reproduction that faced our ancestors. Because these problems and associated solutions are species-specific, they could not have been solidified before the emergence of the human species in the early Pleistocene, roughly 1.8 million years ago. There is nothing special about the end of the Pleistocene that demands the end of human evolution. However, because the time between the end of the Pleistocene and today is such a small portion of human existence (one half of 1%), it is unlikely that evolutionary pressures have had much of an impact on human design over the last 10,000 years.

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