Part I

From "Selfish Genes" to Moral Beings: Moral Psychology after Darwin

You get a lot more with a nice word and a gun than with a nice word.
(*Al Capone*)

In the opening passages of *The Selfish Gene,* Richard Dawkins has us imagine a gangster (let's call him Sonny) who managed to live a long and prosperous life in the Chicago underworld. Dawkins asks us to consider the kinds of qualities Sonny must have had to survive so long in such an environment. Well, we might reasonably guess that Sonny was *not* uniformly benevolent or generous or tenderhearted. At the very least, Sonny must have been tough. He must have been keenly aware of others' loyalty. He must have been quick to spot deception and merciless with competitors. He must have been, according to Dawkins, "ruthlessly selfish" at the core. (Fans of *The Sopranos* will have no trouble getting the picture.) The point of Dawkins' story, however, is that Sonny is our mirror: insofar as we're prepared to ascribe these qualities to Sonny, we should be prepared to ascribe these same qualities to *ourselves*. We are, after all, survivors of our own rough neighborhood. Here's how Dawkins explains it.

Our genes have survived millions of years in a highly competitive environment. But this was possible only because genes are self-serving. And creative. Along the way genes developed ingenious *vehicles* to ensure their survival and reproduction. Some of those vehicles are quite simple. Others verge on the miraculous. But simple or miraculous, the underlying idea is the same: the living forms we see around us – birds and bees, ferns and foxes – are, in the end, "gene machines." And so it is with us: *Human beings*

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are just another kind of gene-machine. Although we dress better than mollusks and make better sandwiches than baboons, we are in principle no different from them. We're just more sophisticated means of making more genes; after all, we are only here for *their* sake. But, as Dawkins notes, since "gene selfishness will usually give rise to selfishness in individual behavior," we have every reason to believe that, despite appearances to the contrary, each of us is ruthlessly selfish at the core. "Scratch an altruist," writes the biologist Michael Ghiselin, "and watch a hypocrite bleed" (Ghiselen 1974: 274). Each of us harbors our own little inner gangster. Almost apologetically, Dawkins concludes: "Much as we might wish to believe otherwise, universal love and the welfare of the species as a whole are concepts that simply do not make evolutionary sense."

And yet, when we step back and observe ourselves, there is something about Dawkins' story that doesn't make sense. For if he's correct, then people would never have an interest in doing the right thing (never mind *knowing* what the right thing to do is); people would never admire virtue, rise up against injustice, or sacrifice their own welfare to benefit strangers. If human beings are ruthlessly selfish at the core, then we should find *unintelligible* Adam Smith's observation that man possesses capacities "which interest him in the fortunes of others, and render their happiness necessary to him, though he derives nothing from it, except the pleasure of seeing it" (Smith 2010/1759: 9). But we don't find Smith's observation unintelligible. Even the cynic has to admit that people do sometimes have an abiding interest in doing the right thing (even those who don't *know* what the right thing to do is). A surprising number of people work on behalf of the poor and disenfranchised. Consider that in 2004 private American citizens gave more than $24 billion of their own money to aid complete strangers (Hudson Institute 2007: 14). This hardly sounds like the work of a band of "ruthlessly selfish" creatures. At the very least, people seem to care about how their actions will be received by others. More striking still is the fact that people seem to care deeply about acting in accord with their own *conscience*. One of the great themes of literature is the psychic peril of "getting away with the crime": merely knowing that we've acted wrongly can be its own punishment. So perhaps the analogy with the gangster is inapt. Perhaps humans transcend their evolutionary roots in a way that cannot be explained by biology. Indeed, perhaps we've hit upon what separates humans from the rest of the natural world: our ability to grasp a (the?) moral order. This would render biology irrelevant to the study of moral psychology.

So where does this leave us? I began with a biological picture of human beings that appeared to exclude the moral. I then presented a moral picture of human beings that appeared to exclude the biological. We thus have a decision to make. We can: (a) embrace the biological picture and *explain away* the moral part of ourselves; (b) embrace the moral picture and *explain away* the biological part of ourselves; (c) or *reconcile* the biological and moral pictures. As implausible as this last option may sound, a growing number of theorists from across the spectrum are throwing their weight behind it. (Not that the idea doesn't sound odd: "In the same way that birds and airplanes appear to defy the law of gravity yet are fully subjected to it, moral decency may appear to fly in the face of natural selection yet still be one of its many products," writes the renowned primatologist Frans de Waal 1996: 12.) Indeed, one of the aims of this book is to defend the idea that moral decency does have its roots in biology.

In addition to the growing empirical and philosophical body of work outlining various means of reconciling our moral and biological natures, there is the cost of embracing one of the other options. On the one hand, we are moving inexorably towards a picture of human nature that is richly informed by evolutionary theory; robust trends are appearing in anthropology, sociology, psychology, economics, and philosophy. It is difficult to imagine, then, abandoning biology in any serious quest to understand human nature. On the other hand, any picture of human beings that leaves out our moral sensibility is fatally incomplete. This isn't to say that we are uniformly good or even decent. It is to say that our practical lives are indelibly marked by moral thought: we make moral judgments; we deliberate over what the right thing to do is; we experience moral emotions (e.g. guilt and benevolence); we punish wrongdoers and reward the virtuous.

Hence, if we are not yet prepared (as theorists) to overlook our moral natures *or* the power of biological explanations, then we assume the burden of reconciliation: How can we bring these two pictures of ourselves into alignment? Attempting an answer to this question is the task of the first part of this book. I say "attempting an answer" because the state of the field (what might be called *evolutionary moral psychology*) is still quite young – and speculative. Although there appears to be consensus at some very basic levels, as you'll see, there remain deep disputes. Much of our work will consist in surveying these disputes. But I will also attempt to offer what I take to be more promising lines of research. After all, I have my own theories

regarding the evolution of morality. At any rate, the next five chapters are united around two general questions: (1) *Why* might natural selection have favored hominids who thought and (sometimes) behaved morally? And (2) *How* did natural selection fashion – out of preexisting materials – hominids who thought and behaved morally?

1

Natural Selection and Human Nature

In a single stroke, the idea of evolution by natural selection unifies the realm of life, meaning and purpose with the realm of space and time, cause and effect, mechanism and physical law. It is not just a wonderful idea. It is a dangerous idea.

(*Daniel Dennett, Darwin's Dangerous Idea*)

To be human: To be the place where the falling angel meets the rising ape.

(*Terry Pratchett, Hogfather*)

In order to get some traction on the question of natural selection's role in the development of our moral psychology, we first need to refresh ourselves on the basics of Darwin's theory. In this chapter we review some of the basic features of evolution by natural selection. We will not bother too much with the details. What's important is to highlight the general principles that have led some moral psychologists to claim that evolution played a critical role in shaping our moral mind. I'll start with the general story, which is actually quite easy to tell. Then, with that story firmly in place, I'll dispel some common misconceptions about the view. In the final sections, I'll explore the ways in which this story has been extended to psychology, where it is claimed that, like our bodies, our minds contain specialized adaptations.

1.1 The Basic Story

At the center of what might be called the Darwinian Revolution, amid the myriad details and disputes, refinements and revisions, field tests and

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computer models, is a very simple, very elegant idea. Here's a glimpse of it in Darwin's own words:

> More individuals are born than can possibly survive. A grain in the balance will determine which individual shall live and which shall die, – which variety or species shall increase in number, and which shall decrease, or finally become extinct. (Darwin 2003/1859: 467)

Buried in this passage are three conditions on which the entire edifice of evolution by natural selection stands: *variation*, *differential reproduction*, and *inheritance*. Let's look closely.

One background assumption, left unstated in the passage, is that the number of reproducers in a given population will eventually outgrow an environment's resources; hence, "more individuals are born than can possibly survive." But, Darwin implies, all individuals are not created equal: speed, strength, coloration – these *vary* within a population. Some (but *only* some) of these variations – in the particular environment individuals inhabit – will over time alter an individual's reproductive success; there will be, that is, *differential reproduction* within a population. For example, the individual moth that happens to be grey tends to be overlooked by predators in her environment, whereas the individual moth that happens to be white makes for an easy meal in that same environment. That tiny difference in color, that "grain in the balance," may well affect not only that individual's chances of survival and reproduction, but the makeup of the species as a whole. Why? Because if we assume that variation in color can be *inherited*, then offspring will tend to exhibit that color variation as well. And since grey moths have a small reproductive advantage over white moths, grey moths (all things being equal) will come to dominate the population. Mother Nature will "select against" white moths in that environment. In sum, some *variations* that occur naturally among reproducing organisms improve an individual's *rate of reproductive success* in relation to its neighbors; when these fitness-enhancing variations are passed on to offspring, you have evolution by natural selection.[1]

As simple and mindless as this process may sound, its power is hard to overstate. The evolutionary biologist Theodosius Dobzhansky went so far as to claim that "nothing in biology makes sense except in the light of evolution" (1964: 449). First, the theory offers a direct and uncluttered explanation for much of the diversity of organic structures we observe across time and across the biological world, an explanation that does not

draw on anything more controversial than, say, the workings of genes. With enough time, the pressures of an unforgiving environment – together perhaps with picky neighbors – will yield any number of exotic forms, from flying squirrels to jellyfish to redwoods.

Second, the theory delivers what was once thought *un*deliverable: an explanation of design that does not depend on a designer. Who could deny that the human eye or the finch's beak is exquisitely suited to its environment? It would seem from any commonsense perspective that that fit *had* to be the result of some kind of engineer, someone who understood both how the design would integrate with the other workings of the organism and how it would mediate the organism's interaction with its environment. But that perspective is distorted by, among other things, our place in time. Were we capable of "rolling back the tape" and observing each generation, with its incremental alterations and minor reproductive successes, we would find the development of the human eye, for example, almost unremarkable. The philosopher Daniel Dennett (1995) compares the process to selecting a tennis champion. How does every tennis tournament always select a champion? Easy, she's the last person standing after all the rounds. Remember: we do not see the 99 percent of genetic mutations that do *not* advance an organism's fitness; we only see the "winners." Success in design is inevitable and ubiquitous for the simple reason that creatures ill suited to their environment have, as the philosopher W.V. Quine put it, "a pathetic but praiseworthy tendency to die before reproducing their kind" (1969: 126).

Finally, the core logic of evolutionary explanations is not limited to the shape of organs or the strength of bones, but extends rather smoothly to observable *behaviors*. Beginning in the 1960s, biologists following the work of Konrad Lorenz and Nikolaas Tinbergen developed methods of analyzing the underlying structure of animal behavior, a field that came to be known as *ethology*. Here, critical focus was directed on the adaptive purpose(s) of certain behaviors, for example, the phenomenon of "imprinting" observed in ducklings.[2] The assumption among ethologists was that there existed a series of evolutionary events – or *adaptive pressures* – that ultimately led to the behavior. This would explain, if anything did, what the behavior was for. And this in turn might aid in understanding the developmental influences that lead to the expression of the behavior in individuals.

From here, it is only a few short steps back to our main subject: the human moral sense. (For the time being, think of a *moral sense* as a tendency to

make moral judgments and experience moral sentiments.) *If* – and I stress the *if* – one wanted to argue that our moral sense is the product of evolution by natural selection, the general shape of the argument must look something like the following. Through the process of genetic variation, some individual (presumably some early hominid) developed something approximating a moral sense. While perhaps only slightly distinct from its evolutionary precursor, that sense enabled its possessor to survive and reproduce at a rate that exceeded, if only slightly, the rate of her neighbors. Left unchecked, the process of natural selection yielded a population dominated by individuals who possessed this moral sense.

Let me emphasize, however, two things: first, this argument amounts to little more than a general schema; all of the details needed to make this argument remotely plausible have been left out. In later chapters we will explore these details. Second, one could maintain that evolution by natural selection contributed to the development of our moral sense, but only *indirectly*. Two positions present themselves.

One of the positions that we will discuss later asserts that our moral sense was, if you will, a "by-product" of some other system that was directly selected for. As a point of comparison, consider the color of human blood. No one seriously believes that the redness of human blood was directly selected for. What was directly selected for was the oxygen-carrying properties of blood; the redness "came along for free." That was an accidental property of blood.[3] In the same way, some wish to claim that our moral sense was an accidental property of other cognitive adaptations – for example, our capacity to reason about the consequences of our actions.

A distinct but related position states that our moral sense did evolve according to the laws of natural selection; however, the function that our moral sense originally served has been replaced (due to changes in environmental circumstances) by a more recent function, which in turn can alter its structure. A popular example of this kind of biological sleight of hand is the structure of the human lungs. Some biologists insist that human lungs originally evolved, millennia ago, to aid predatory fish in pursuing prey (Farmer 1997). But once the ancestors of these fish began their forays onto land, those "swim bladders" were well suited to respiration. Thus one might argue that our moral sense may have originally evolved to serve a purpose entirely unrelated to its present purpose.[4] The exact structure of these views will have to wait. In the meantime, let me warn against some common misunderstandings of Darwin's theory.

1.2 Some Common Misunderstandings

The theory of evolution by natural selection does *not* entail the claim that every feature of every organism is an adaptation. It is consistent with the theory that some (some insist on many) of the organic structures we observe are not the result of the pressures of natural selection. Some are the result of random genetic mutation; others are the result of what biologists call *founder effects*, according to which a dominant characteristic (e.g. coloration) of an isolated sub-population is the result of an arbitrary feature possessed by the founders of this sub-population. So, for example, a group of green-winged finches becomes separated from the main colony of finches, only a fraction of the birds in which are green-winged. Assuming "green-wingedness" does not influence reproductive success, we will nevertheless observe "green-wingedness" come to dominate this population even though this form of evolutionary change is not the result of natural selection. Some organic changes are the result of *genetic bottlenecks*. Like founder effects, genetic bottlenecks occur when a population shrinks rather suddenly (e.g., following an earthquake), leaving only a subset of the genes of the original population.

It's worth pausing a moment to point out what these alternative processes of evolution might mean for our main inquiry. One could, for example, claim that our moral sense evolved, but that its evolution was not the result of natural selection. According to a story like this, our moral sense was not an adaptation. Its existence might be the result of a process no fancier than that which produced "green-wingedness." If this were the case, it would be fruitless to search for the (biological) purpose of our moral sense. It has no purpose. As we move forward, it's important to keep these alternatives in sight.

Another common misunderstanding of Darwin's theory is that evolutionary change is, in some sense, *forward-looking*, or deliberate. Part of the problem stems from terminology: to say that over time organisms *adapt* to their environments strongly invites the mistaken idea that Mother Nature – or the organisms themselves – actively solve adaptive problems by altering their structure. In the standard example, the giraffe reasoned that reaching the leaves in the high trees required a long neck, and so – *voilà*! – a long neck. This of course is nowhere near the truth. We have to remember that natural selection can only "act" on those variants that happen to exist, and which variants happen to exist is quite arbitrary, since variation is by and large the

result of genetic "errors" during DNA replication. This is not to deny that some organisms are exquisitely suited to their environment. But it is almost always the case that, on much closer inspection, those adaptive "solutions" are surprisingly jerry-rigged: instead of designing the most efficient or reliable or economic solution, Mother Nature appears to have rigged together pieces and parts of other existing designs (a bone here, a ligament there) to enable the organism to get by. Daniel Dennett (1995: 211) refers to them as "perversely intricate solutions." If the raw material on which natural selection acts is genetic variation, then this is precisely what we should expect to see: tinkering. She may be clever, but Mother Nature is nonetheless a tinkerer.

1.3 Mother Nature as Tinkerer

At least part of the resistance to the idea that our moral minds are the product of natural selection comes from a deep suspicion that natural selection, despite its force, could never lead to a mode of thinking as rich and emotional and powerful as moral thinking. Mother Nature is simply not that clever. One way that biologists have tried to ease this suspicion is by having us think about other more familiar processes that, despite their rigidity, produce quite original and unexpected results. Here's a common method biologists and philosophers use to loosen our resistance:

Your assignment is to compose an original Petrarchan sonnet. In case you've forgotten, a Petrarchan sonnet is a poem consisting of fourteen lines; each line should contain, with only one or two exceptions, ten syllables, where every other syllable is accented. The proper rhyme scheme is: *a-b-b-a/a-b-b-a/c-d-e-c-d-e.* Although I leave the theme up to you, it is expected that the first eight lines should introduce a problem or dilemma; the remaining six lines should seek to resolve the problem.

I'm going to bet that you would not relish the thought of completing such an assignment. It's just too constricting. Even if you manage to hit upon an agreeable theme rather quickly, what promises to take up all your time is fitting that theme into the poem's rigid confines. Obviously, you can't designate in advance your rhyming words ("bird," "heart," "start," "blurred") without making your task nearly impossible. Instead, you just have to strike out in a general direction. Put some words on paper and be prepared to make lots of adjustments. You should expect of course that most of your early efforts will have to be trashed. It's not enough to find a word that

rhymes with "deranged"; the word has to fit both *locally* (that is, grammatically) and *globally* (that is, thematically). In some cases, a particularly effective turn of phrase may necessitate restructuring the entire stanza. As unpalatable as this assignment may seem, I would wager that if you were to stick with it, if you were to wrestle your poetic imagination into the poem's form, you would surprise yourself. You wouldn't necessarily proclaim, "I'm a poet after all!" You would, however, produce some quite original and unpredictable lines, and apart from the music of the poem, they would express some quite original thoughts. (The price of doubting me on this, of course, is writing your own sonnet.) But the reason such an exercise is likely to yield unexpected results lies precisely in the *restrictions of the form*. Poetic "energy" has to be channeled, often in unnatural directions. The mathematician Stanislaw Ulam observed that poetic form "forces novel associations and almost guarantees deviations from routine chains or trains of thought. It becomes paradoxically a sort of automatic mechanism of originality" (1975: 180). In the process of wearing out the delete key on your computer eliminating all the obvious expressions (simply because they don't fit), eventually something clicks. It fits the meter, it sets up the rhyme, and it advances the larger theme. Ingenious! Moreover, what are the chances you would have come up with that expression in the absence of such restrictions?

The point of this little example is to emphasize the unlikely power of *form* or *law* in the creation of solutions. To be sure, writing a sonnet and designing species are dis-analogous in a variety of ways. Most notably, there is no analogy to the role of poet in the case of evolution; the metaphor of "tinkerer" is just that, a metaphor. There is selection going on in both instances, but the most that can be said in the case of evolution is that species are being selected for by the processes outlined above. Still, the metaphor is instructive: Mother Nature "tinkers" with the different designs that genetic mutations make available, just as we would tinker with words in composing a sonnet. Of course, like the vast majority of words you can think of, most organic alterations won't fit within the imposing confines already set up. Such alterations either don't fit locally (they're incompatible with the organism's internal structure) or globally (they decrease an organism's reproductive success relative to its neighbors). But every now and then, a slight modification of existing structure fits. Mother Nature's tinkering pays off. And, as in the case of writing the sonnet, the originality can be breathtaking: webbed feet, echolocation, poisonous venom, photosynthesis. Perhaps even thought.

So maybe we should take Richard Dawkins' advice: "Never say, and never take seriously anyone who says, 'I cannot believe that so-and-so could have

evolved by gradual selection.' I have dubbed this kind of fallacy 'the Argument from Personal Incredulity.' Time and again, it has proven the prelude to an intellectual banana-skin experience" (1995: 70).

In the next section we build on these earlier scientific developments and explore the exciting (and controversial) new field of evolutionary psychology. As the name suggests, evolutionary psychology proposes to study the human mind in the same way that evolutionary biologists study organic form: by applying the principles of Darwinian selection. In this case, the objects of study are patterns of human behavior, patterns of human thought and desire. The study is directly relevant to our main focus, for it is often within the field of evolutionary psychology that some theorists locate the evidence for an evolved moral sense.[5]

1.4 Evolutionary Psychology and Human Nature

You may have no problem accepting a Darwinian explanation for the structure of the human eye. Ditto for the human lungs, liver, colon, and circulation system. But what about jealousy? What about friendship? What about men's proneness to violence, or women's interest in looking young? What about language? *These* things, you say, are another matter. Perhaps not, say evolutionary psychologists.

Today, Darwin's ideas about evolution occupy an interesting place. On the one hand, when it comes to explaining the *bodily* features of human beings (the human heart or the human hip joint), most people have no problem appealing to evolution by natural selection. On the other hand, when it comes to explaining the *psychological* features of human beings, people resist appealing to evolution by natural selection – if it occurs to them at all. Apparently, there is an explanatory divide between the human body and the human mind. That divide is perpetuated (I suspect) by the weatherbeaten distinction between nature and nurture.

The prevailing assumption is that the human body is as it is *by nature* (for example, you didn't learn to grow legs instead of fins), whereas the human mind is as it is *by nurture.* Your attitudes about what makes a desirable mate, for example, were primarily shaped by your environment. That divide between body and mind, however, is eroding. In this section, we explore what some are calling the new science of the mind, evolutionary psychology, which actively seeks to integrate psychology and evolutionary biology.

Contrary to the prevailing assumption, evolutionary psychology maintains that there is a common explanatory framework underlying both human physiology and human psychology: evolution by natural selection. A complete understanding of the human mind, according to evolutionary psychologists, requires understanding the evolutionary pressures that shaped it so many millions of years ago. We do not come into the world as blank slates, as many commonly assume. Instead, they argue, our heads are full of psychological *adaptations*.

Of course, when asked to think of evolutionary adaptations most of us think of *anatomical* features like a duck's webbed feet or a lizard's camouflaged skin. According to the standard account, webbed feet initially arose as a result of a genetic mutation; because webbed feet enabled their possessor to out-reproduce its neighbors (all things considered), over time webbed feet spread to the entire population. Evolutionary psychologists are proposing a similar account for *mental* features. At some point in the distant past, a certain mental system arose in an individual as a result of a genetic mutation; this system altered her psychology – the way she thought or felt or reasoned or desired. And because this system enabled her to out-reproduce her neighbors (all things considered), over time that mental system spread to the entire population. Speaking grandly, we might say that just as webbed feet are part of a duck's nature, so, too, certain ways of thinking or reasoning or desiring are part of human nature.

Returning for a moment to our main theme (i.e. the human moral sense), we can put our question this way: Is having a moral sense part of human nature, where that nature is best explained by evolution by natural selection? As we'll see below, in order to answer that question we will need to look carefully at the kind of adaptive problem (if any) that our moral sense was designed to solve. Webbed feet, for instance, helped solve the problem of efficient movement through water. If our moral sense is indeed an adaptation, then there should be good evidence that possession of such a sense helped to solve (or to solve more successfully than one's neighbors) a particular adaptive problem. But we're getting ahead of ourselves. Let's look more closely at the details of evolutionary psychology.

1.5 An Evolved Mental Tool-Box

Evolutionary psychologists hypothesize that the human mind is equipped with many (some say very many) different evolved psychological mechan-

isms. Instead of viewing the mind as containing a single all-purpose "problem-solver," evolutionary psychologists view the mind in roughly the way we view the body. We know the body does not contain a *single* anatomical mechanism to deal with the body's journey through the world. Rather, it contains *different* mechanisms to confront *different* problems: a liver to filter out toxins, lungs to take in oxygen, antibodies to fight off bacteria and viruses, and so on. It's true that each mechanism is profoundly limited in what it can do (your digestive system is a pretty bad listener), but this cost is more than offset by the benefits. With only one task to complete, each system should be able to do it efficiently, economically, and quite reliably.[6] And even if other systems break down (you lose your eyesight, for example), most other systems should remain operational.

Evolutionary psychologists contend that this is the way we should understand the human mind.[7] Like the body, the mind requires different mechanisms to deal with different tasks. After all, the alternative to this picture – a single, all-purpose psychological mechanism – is, say evolutionary psychologists, hard to accept:

> The idea that a single generic substance can see in depth, control the hands, attract a mate, bring up children, elude predators, outsmart prey, and so on, without *some* degree of specialization, is not credible. Saying that the brain solves these problems because of its "plasticity" is not much better than saying it solves them by magic. (Pinker 1997: 75)

What we're left with, then, is what some psychologists call a "modular" account of the mind: many distinct modules designed to solve many distinct problems. That is, many distinct "tools" to take on many distinct problems. It's an *evolutionary* account because natural selection is responsible for the design. But what are these modules?

According to David Buss, a leading evolutionary psychologist, an evolved psychological module or mechanism is "a set of procedures within the organism that is designed to take in a particular slice of information and transform that information via decision rules into output that historically has helped with the solution to an adaptive problem" (2007: 52). What does this mean? Well, first, by "a set of procedures," Buss is acknowledging that there may be many subsystems involved in delivering information from the environment to the mechanism. Visual systems, auditory systems, chains of logical inference, all of these may deliver information to the mechanism. Nevertheless, the mechanism is designed to take in *only* "a particular slice of

information." The mechanism for choosing mates, for example, will not process information regarding the color of the grass or the taste of the berries or the speed of passing clouds. Instead, that mechanism (it is alleged) is designed to take in and process only that information that is relevant to choosing a mate, and which information is relevant will depend on the operative "decision rules." Such rules (we can imagine) amount to "If . . . then" clauses: *if* the mechanism registers so-and-so, *then* do thus-and-so and/or think so-and-so.[8] Because these rules do not process information about innumerable other things (just as your house-key does not open innumerable locks), that mechanism is described as *dedicated* or *domain-specific*.

Finally, the presence of *this* mechanism – as opposed to some other mechanism – is explained by the fact that, given the preexisting materials of the hominid brain, *this* mechanism helped to solve an adaptive problem that confronted our hominid ancestors. This last part is extremely important. The psychological mechanisms that evolutionary psychologists claim fill the mind did not evolve to in response to problems we confront today. They *may* help in solving similar problems today, but that's not why we possess them. We possess them because they solved recurrent problems confronting our distant ancestors. And since they haven't been "selected out" of the population, current populations still posses them. As evolutionary psychologists like to say, our modern skulls house stone-age minds.

1.6 Some (More) Common Misunderstandings

As you might imagine, when the topic turns to human nature (and the alleged evolutionary roots of that nature), the landscape is suddenly awash in landmines. From the rather straightforward biological story above, it is easy to find oneself concluding all sorts of dubious things. I want to spend a few moments warning against several dangerous missteps: (1) conflating adaptation and adaptiveness; (2) conflating explanation and justification; (3) misunderstanding the scope of an evolutionary explanation; and (4) succumbing to the temptation of genetic determinism.

Conflating adaptation and adaptiveness

One of the most seductive confusions in this area concerns the distinction (and there *is* one) between adaptations and adaptiveness. Simply put, what

is adaptive is not necessarily an adaptation, and adaptations are not necessarily adaptive. Some examples will help. Going to your doctor for an annual physical is adaptive insofar as it increases your chances of survival and reproduction; however, no one is going to conclude that the mind possesses a "going to the doctor" mechanism, dedicated to identifying doctors and motivating the organism to seek out their counsel. Going to the doctor is, if you will, a *learned* behavior – at least for those who learned it. The point is that we should be careful not to conclude that a piece of behavior is (or, more carefully put, is produced by) a psychological adaptation *just because it happens to be biologically adaptive*.

What is perhaps less obvious is the claim that adaptations are not necessarily adaptive. When an evolutionary psychologist claims that a piece of behavior is produced by a psychological adaptation (let's call it *A*), she is *not* claiming that *A* produces adaptive behavior. She is claiming, instead, that *A*, *on average*, tended to produce behavior that was more adaptive than competing designs *in the environment in which A evolved.* But the environment in which *A* evolved may not resemble our current environment; hence, there is no guarantee that *A* will be adaptive in this current environment. Think of it this way. By most estimates, 99 percent of our species' history consisted of hunting and gathering under the harsh conditions of the African savannah. So the psychological mechanisms that evolved evolved in response to *those* conditions. But now imagine transplanting that "stone-age mind" into the skull of a citizen of the modern world, with its maze of office cubicles and public transportation, its online dating and jury duty, its Google and Facebook, its GPSs and ATMs. Is it any wonder that some of our stone-age solutions (to adaptive problems) are not up to the task of the problems of the modern world?

Return to an example discussed in the Introduction: our preference for fatty foods. It should be immediately obvious that early humans regularly confronted the problem of getting enough to eat. One solution to this problem would have been a greater discrimination in respect of what one ate: preferring fatty foods increased one's chances of increasing caloric intake thereby increasing one's store of energy and so on. But that same solution – a strong preference for fatty foods – that was so adaptive during the period of hominid development is decidedly *non*-adaptive in environments rich in cheeseburgers and chocolate doughnuts. Again, the point to bear in mind is that when it is claimed that such-and-such is a psychological adaptation, the claim should be understood, first and foremost, as a claim about our *evolutionary past*, about a particular psychological solution to an

adaptive problem that repeatedly confronted our distant ancestors. Whether or not that solution is well suited to our current environments is a separate matter.

Conflating explanation and justification

One might reasonably suspect that some of the popular resistance to contemporary evolutionary psychological accounts stems from a confusion over what these accounts are aiming at. Some critics of evolutionary psychology mistakenly suppose that such accounts amount to an endorsement or justification of the relevant behavior. So when, for example, they hear that the male tendency to prefer multiple sexual partners (assuming such a tendency exists) is accounted for by the forces of sex selection, it is all too tempting to think that such an account is meant to excuse males ("How can you blame him? It's in his genes!"). But this temptation must be resolutely fought. As the old saying goes, "To understand is not to forgive."

Simply put, evolutionary psychologists seek to *explain*, not to *excuse*. They are attempting to describe the causal processes that lead to observed human behavior; they are *not* attaching value either to the processes or to the behavior. They are *not* claiming, for example, that male promiscuity is good or bad, virtuous or vicious. Such claims are – or, at least should be – left up to those who seek to understand the nature of goodness and badness, virtue and vice. So while you may hear evolutionary psychologists describe a psychological mechanism as "fitness-enhancing" or "effective" or "reliable" or "detrimental," none of these adjectives should be thought of as ascribing value (or disvalue) to the mechanism *beyond the merely biological context.* If we seek to know whether a mechanism is good *all things considered*, presumably we must look beyond biology. As this discussion makes clear, the distinction between explanation and justification carries particular significance in the moral realm. As such, we will be revisiting this subject in part II.

Misunderstanding the scope of evolutionary explanations

If you want to understand why you do the things that you do, it would be a mistake to turn to evolutionary psychology for anything but the most indirect and abstract explanation. To see why, consider an analogy. If I want to figure out what kind of music you like (without your assistance, that is), I might choose to conduct a poll to find out what *most* people in your

demographic like in the way of music. Suppose I find out that, based on a representative sample, 73 percent of those in your demographic prefer hip-hop. How confident should I be that *you* like hip-hop? Well, sort of confident; it's better than flipping a coin, I guess. But a better approach would be to investigate the kinds of music you were exposed to growing up, especially through your teenage years – what your parents listened to, what your siblings listened to. Most of all, I would want to know what your friends listen to. These lines of detail are going to be essential in forming predictions about the kinds of music *you* like. Polls might help narrow down the field, but only crudely.

Similarly, evolutionary psychological accounts of human behavior are like polls in this sense: they measure large-scale trends. They predict what *most* humans will be like. Actually, such accounts are more general than even this. Evolutionary psychological accounts predict what most humans will be like *under specified circumstances*. Even the most ardent defender of evolutionary psychology will recognize the tremendous adaptability of the human mind. We are fabulous learners (even if we are notorious forgetters). What this means is that psychological adaptations rely critically on environmental input, a point that can't be over-emphasized. That's why knowing why you do the things you do will require knowing a lot about your environment. At best, the psychological adaptations posited by evolutionary psychologists might provide the framework for some probability claims about you: you will *probably* prefer this over that or think this rather than that, *in the presence (or absence) of these specific environmental inputs.* But this is a very "low-resolution" picture. This is like a charcoal outline of who you are. For a "photo-realism" picture, you need to supply all the rich details of your environment. Thus, the *scope* of evolutionary explanations about human psychology is notably limited. They explain, at best, patterns at the level of populations; they won't tell you much about what makes you, in all your rich detail, you.

Succumbing to the temptation of genetic determinism

I warned against this temptation in the Introduction, but it bears repeating. Although the structure of your mind is partly the result of your genes (at least according to evolutionary psychology), and although you have the genes you do in part because of your evolutionary history, none of this *determines* how you will behave, in the sense that there is only one course of action open to you. (So you're not likely to get much mileage out of the

excuse: "Darwin made me do it!") The reason is, there is simply no causal chain linking gene sequence ABC to behavior XYZ. Gene sequence ABC will tend toward a *range* of behaviors depending on, among other things, other genetic structures, learned behaviors, and ongoing environmental input. You are not, as the biologist Paul Ehrlich emphasizes, "captives of tiny self-replicating ... genes" (2002: preface). Genes do not, he says, shout commands at you; "at the very most, they whisper suggestions." Remember: your genes represent but the barest outline of the kind of person you are. Your environment (your parents, your friends, your culture) plays a critical role in shaping how you will respond to various situations.

Indeed, when we note the tremendous impact your upbringing has on your behavior, one has to wonder whether genetic determinism should worry us less than *environmental* determinism, according to which your behavior is determined by (or, let's say, strongly influenced by) the environment in which you were brought up. Just think of the variety of excuses that have made their way into courtrooms: "the abuse excuse, the Twinkie defense, black rage, pornography poisoning, societal sickness, media violence, rock lyrics, and different cultural mores" (Pinker 2002: 178). The truth is, the worry over genetic (or biological) determinism is actually a symptom of a deeper philosophical mystery, one that philosophers are still actively wrestling with: the problem of moral responsibility. It is not that behavior-caused-by-genes is any more (or less) morally problematic than behavior-caused-by-environment; the morally problematic notion, in the eyes of philosophers at least, is the mere notion of behavior-that-is-caused. After all, can we not *ultimately* link the causes of one's behavior to some force(s) outside one's skull? "If we *ever* hold people responsible for their behavior," Pinker maintains, "it will have to be in spite of any causal explanation we feel is warranted, whether it involves genes, brains, evolution, media images, self-doubt, bringing up-ke, or being raised by bickering women" (2002: 180). In conclusion, whatever the prospects of evolutionary psychology, they do not rise or fall with the set of philosophical problems raised by the specter of determinism. Even if your genes shouted commands at you (which they do not), this wouldn't show that evolutionary psychology was a defective scientific hypothesis. Unsettling, yes. Untrue, no.

So, let's review the missteps to avoid. First, the search for psychological adaptations is *not* the search for adaptive behavior, but rather the search for those psychological traits that were adaptive during the long period of our species' evolution. Second, to explain a piece of human behavior in terms of

evolution is *not* to justify (or endorse or recommend or applaud) that same piece of behavior. Third, to explain on evolutionary grounds why humans, as a group, tend to behave in the ways they do does *not* explain – in any interesting detail, that is – why you or I performed *that* action at *that* moment. Finally, you are not condemned to act in the ways that are (at most) "outlined" in your genes; at most, your genes, mediated by your brain, *suggest* lines of action.

So how do these missteps bear on our main inquiry, the evolution of the human moral sense? First, it would be a mistake to conclude that our moral sense is *not* a psychological adaptation on the grounds that it does not produce biologically adaptive behavior in *this* environment. Second, if our moral sense is indeed an adaptation and if a given piece of behavior (call it *B*) is indeed produced in part by that sense, we cannot automatically conclude that *B* is good or virtuous or whatever. (Conversely, if *B* is not produced by that sense, we cannot conclude that *B* is bad or vicious or whatever.) And finally, in case it was not already obvious, having a moral sense does not guarantee moral behavior. More importantly, it would be a mistake to conclude that our moral sense is not a psychological adaptation on the grounds that *not everyone* behaves morally or makes correct moral judgments. After all, we don't conclude that our visual system is not an adaptation on the grounds that our eyes sometimes fool us. The existence of an evolved moral sense is compatible not only with different moral judgments (concerning the same event, say), but also with wide-ranging differences in moral behavior. This is an under-appreciated point. Psychological adaptations, if there are any, do not entail universal – or even near-universal – similarities in thought or behavior. This might be the case if the environment did not have a role in shaping our psychology. But we know that just the opposite is true.

1.7 Conclusion

In this chapter I've tried to present the building blocks for understanding evolutionary adaptations – in particular, psychological adaptations. All adaptations have this in common: they started out as genetic mutations; because those mutations tended to give their possessors a reproductive advantage, however slight, they eventually spread to the entire population. The central tenet of evolutionary psychology is that, like the body, the mind contains an array of adaptations, each designed to assist an individual in

managing a particular kind of recurrent adaptive problem. Narrowing our focus even further, we can see how proponents of an evolved moral sense are going to go about making their case: such a sense tended to give our ancestors a reproductive advantage (however slight) over other members of the species. The moral sense is presumably specialized, in the sense that its function is distinct from other functions of the mind, and this is so even if it draws on the operations of other subsystems.

There are, however, other building blocks that need to be laid in place before approaching our main subject. For, as it turns out, natural selection has apparently "primed the pump" for moral thought.

Biologists going back to Darwin have observed in non-human animals behavior that might be described, loosely at least, as *moral* behavior: sharing, self-sacrifice, cooperation, and the like. But such observations seem plainly at odds with natural selection's competitive nature. Indeed, the sight of worker bees sacrificing themselves to protect their hive deeply unsettled Darwin, for his theory had no way to explain this "special difficulty." Such behavior, feared Darwin, was not just "insuperable," but "actually fatal to the whole theory" of natural selection (2003/1859: 236). But through a series of recent breakthroughs, modern biology has erased the unease. Natural selection can actually explain these behaviors. What this means for our purposes is that when early humans came onto the scene they already possessed, by way of inheritance, the mental mechanisms responsible for moral-like behavior, however distant these behaviors are from *genuine* moral behavior. In the next chapter we will explore these recent breakthroughs and consider what natural selection may have added to those early minds to give us the moral minds so special to our species.

Further Reading

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