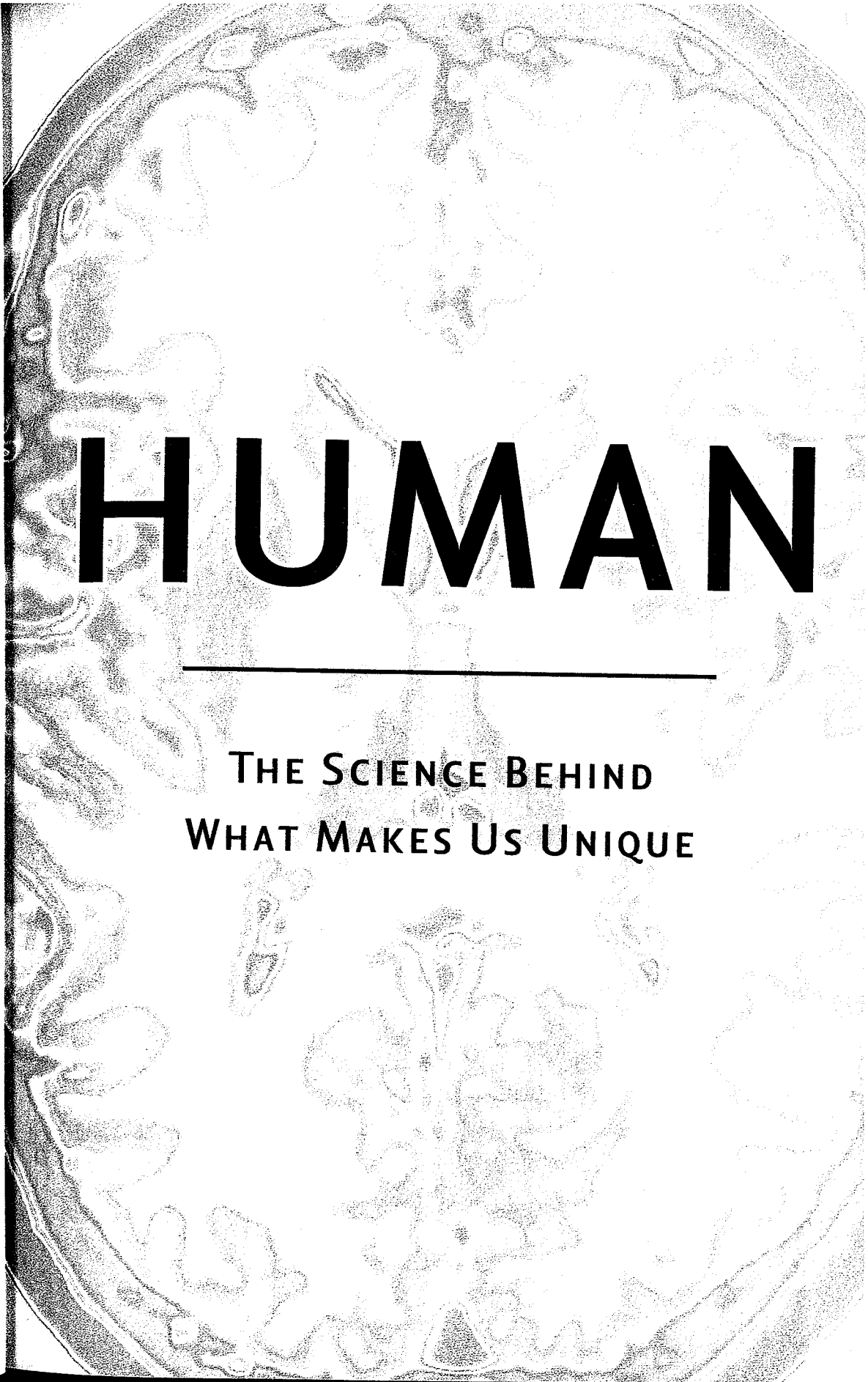


ZANIGA

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HUMAN

THE SCIENCE BEHIND
WHAT MAKES US UNIQUE



MICHAEL S. GAZZANIGA

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Chapter 4

THE MORAL COMPASS WITHIN

You have the morals of a rabbit, the character of a slug,
and the brain of a platypus.

—Cybill Shepherd, as Maddie in
the TV show *Moonlighting*, 1985

IF A MARTIAN WERE TO SHOW UP AND WATCH THE EVENING news with you, there probably would be no limit to the number of martinis he would need to believe that we humans are not inherently violent, amoral, and without purpose. The news drones on. It might start at the local police blotter, with the hit-and-runs, the stop-and-shop store holdups and murders, the domestic abuse, and the shenanigans down at city hall, then proceed to the beheadings in Iraq, the retaliation bombings by the United States, the starvation in Africa, the AIDS epidemic, the plight of illegal immigrants, and on and on. "Holy smokes," the Martian might say. "Your species is bad news." Well, is it?

There are roughly six billion people on earth, and those six billion people more or less get along. Does that mean *all* six billion get along? If we assume only 1 percent are bad eggs in one way or another, that means sixty million people are making trouble for the rest of us. That is a lot of mischief, and if it is 5 percent, one can see there are three hundred million troublemakers in the world. Material for the evening news is everywhere, and for some reason we want to know about the problems, not the joys of the human condition.

We are left with the amazing fact that somehow at least 95 percent of us get along, and possess some kind of common mechanisms that guide us through the social morass or complexities of everyday life. I can remember the day my daughter and I found ourselves walking down a side street in Beijing. We had been guided to the wide boulevards by Tiananmen Square, and all seemed grand and proportionate. But as we took off down the side street to experience some local shopping, we were shocked by the density of people and by how we stood out in both height and demeanor. But we were also shocked by how quickly we all adapted, how the two of us became part of the social flow and milieu in a matter of minutes. Everything from simply crossing the street to buying an item all flowed easily and naturally. I have had more unnatural exchanges on Canal Street in New York than in Beijing.

As a species, we don't like to kill, cheat, steal, and be abusive. We go out of our way to assist in tragedies, emergencies, and the like. Indeed, emergency workers, such as search-and-rescue Park Rangers, have to be trained *not* to be heroes, not to take undue risks to save the lives of others. Soldiers have to get pumped up and be beside themselves to kill. Booze in the military is there not to relieve pain but to disinhibit, so horrendous acts can be carried out. So why are we basically a good bunch of animals?

We humans like to think of ourselves as rational beings. We like the idea that if we are presented with a problem, we can invent a list of solutions, pros and cons, evaluate each one, and then decide which is the best choice. After all, our rationality is what separates us from "being animals." But do we really decide upon a solution because it is the most rational? Why does your friend ask you, when you are presenting your list of choices, "What does your gut tell you?"

When we are presented with a moral decision, is it our rational self that comes forth and makes the decision, or is it our gut, our intuitive self, that first comes up with the judgment, and our rational self afterward tries to come up with the reasons? Do we have a set of moral beliefs that we base rational decisions on, and if so, where does it come from? Does it come intuitively from within, or consciously from outside us? Do we come off the assembly line with a standard set of moral instincts, or are they aftermarket add-ons?

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The world's great philosophers have been arguing over these questions for centuries. Plato and Kant believed conscious rationality is behind our moral actions. Hume favored an immediate emotional feeling of right or wrong. Until recently, all one could do was bat these ideas around without any concrete evidence, but things have changed. With our current research techniques, we can answer many of these questions. In what follows, we are going to discover more about our intuitive selves and how they affect our moral decisions. We are going to see that we actually have hardwired ethical programming that has been selected for, and we will see what these ethical programs are concerned with. We are going to discover how our social world shapes them and turns some into virtues in one culture but not in another.

DO WE HAVE HARDWIRED ETHICAL PROGRAMMING?

To begin with, let me pose a moral dilemma to you, one that has been designed by researchers to demonstrate our intuitive moral judgment. Jonathon Haidt, the very clever psychologist at the University of Virginia whom we met in chapter 3, has come up with a provocative question he puts to his students:

Julie and Mark are sister and brother. They are traveling together in France on summer vacation from college. One night they are staying alone in a cabin near the beach. They decide that it would be interesting and fun if they tried making love. At the very least, it would be a new experience for each of them. Julie is already taking birth-control pills, but Mark uses a condom, too, just to be safe. They both enjoy making love, but they decide not to do it with each other again. They keep that night as a special secret, which makes them feel even closer to each other.¹

The students are asked, was it OK for them to make love? The story was designed to call upon all of one's gut instincts and moral intuitions. Most people will say that it was wrong and disgusting. But Haidt knew that before he started his experiment. He wanted to dig deeper, to get to the root reasoning, if any, we all must use. So he urges his students on: "Tell me why. What does your rational brain say?" Not unexpectedly,

many answer that inbreeding could cause a deformed infant or that they could be hurt emotionally. But remember, they used two forms of birth control, so that is not the problem, and we already have been told that they weren't emotionally hurt but actually grew closer. Haidt tells us that eventually most students will say, "I don't know, I can't explain it, I just know it's wrong." But if it is wrong, and you can't explain why, is that a rational judgment or an intuitive one? Have we been taught a rational rule by our parents or culture or religion that it is morally wrong to have sex with your sibling because it may lead to birth defects, or is it hard-wired knowledge that we have a difficult time overruling with rational arguments?

Where did the incest taboo come from? Incest taboos are one of those human universals we talked about in the last chapter. All cultures have incest taboos. Edward Westermarck, in 1891, figured out how they develop. Because humans cannot recognize their siblings automatically, by sight, for example, he proposed that humans have evolved an innate mechanism whose function is to discourage incest. This mechanism operated by causing a person to be uninterested in or averse to having sex with those he had spent a lot of time with when a child.² This will work most times in preventing incest. This rule predicts that childhood friends and stepsiblings who were brought up together, as well as full siblings, would all be found not to marry.

Support for this idea has come from Israeli kibbutzim,³ where unrelated children are brought up together. They form lifelong friendships but very rarely marry. More evidence for this theory is found in the ancient custom among some people in Taiwan called *shimpua* marriage, in which the family raises the future wife of their son from infancy. These marriages often result in no offspring, simply because the partners do not find each other sexually appealing.⁴

Debra Lieberman, an evolutionary psychologist at the University of Hawaii, expanded upon these findings.⁵ She was interested not only in kin recognition as it related to incest and reciprocal altruism, but also in how personal incest taboos ("sex with *my* sibling is wrong") become generalized opposition ("incest is wrong for everyone"). Did this come from parents or society, or did it come spontaneously from within? She asked her subjects to fill out a family questionnaire, and then asked

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them to rank from least morally wrong to most morally wrong a list of nineteen third-party acts that included sibling incest, child molestation, dope smoking, and murder. She found that there was only one variable that significantly predicted the degree of moral wrongness a subject ranked third-party sibling incest. This was the length of time spent under the same roof as a child and early adolescent with an opposite-sex sibling. The longer one lived in the same house with an opposite-sex sibling, the more morally wrong third-party incest was considered. It was not affected by relatedness (the sibling could have been adopted or a stepsibling); by parental, subject, or peer attitude toward sexual behavior; by sexual orientation; or by how long the parents had been married.

Why this is important to our current topic is that the moral attitude against incest in general was not increased by *learned* social or parental instruction, nor was it increased by the degree of relatedness to the sibling. It was increased only by the amount of time that the subject had actually spent living under the same roof with their sibling (related or otherwise) while being raised. This is not a rationally learned behavior and attitude that was taught to us by our parents or friends or religious teacher. If it were rational, then it would not apply to adopted siblings or to stepsiblings. It is a trait that has been selected because it worked in most situations to avoid producing offspring that were less healthy due to inbreeding and the expression of recessive genes. We got it at the factory.

But our conscious, rational brain does not know that all this is going on. Our conscious brain works on a "need to know" basis, and all it needs to know is that siblings are having sex and that is *bad*. When you are asked, "Why is it bad?" things get interesting. Now you are activating your conscious reasoning system—your interpreter, which doesn't know the above answer unless you have studied the literature on incest avoidance recently. No problem, reasons will come pouring out of your brain anyway!

This is pertinent to research that I have done on people who have had the connection (the corpus callosum) between the two hemispheres of their brains severed for medical reasons. What this does is isolate the right hemisphere from the speech center, which usually is in the left

hemisphere, so not only can't the right hemisphere communicate with the left hemisphere, it can't talk to anyone else either. With special equipment, you can tell the right hemisphere to do something by giving a visual command to one eye, such as "pick up a banana." The right hemisphere controls the motor movement on the left side of the body, so the left hand will pick up the banana. Then if you ask the person, "Why did you pick up the banana?" the left brain's speech center answers, but it doesn't know why the left hand picked up the banana, because the right hemisphere can't tell it that it read a command to do so. The left hemisphere gets the visual input that there is indeed a banana in the left hand. Does it say, "Gosh, I don't know?" Hardly! It will say, "I like bananas," or "I was hungry," or "I didn't want it to fall on the floor." I call this the interpreter module. The intuitive judgment comes out automatically, and when asked to explain, out pops the interpreter to make a rational explanation, keeping everything neat and tidy.

Another factor that we seem to understand intuitively is *intent* in social exchange. That means if someone doesn't reciprocate in a social exchange by accident, it is not recognized as cheating, but if someone intentionally does not reciprocate, it is recognized. Three- and four-year-old children will judge an action in a story of social exchange as being "naughty" if the behavior was on purpose, but not if it was done by accident.⁶ Chimpanzees can judge intention; when someone is trying to grab some food for them but can't reach it, they don't get upset, but they will get upset when someone can reach it but won't.⁷ Lawrence Fiddick, a lecturer in psychology at James Cook University, Townsville, Queensland, Australia, has shown that in detecting cheaters in social exchange, individuals detect intentional cheaters at a higher rate than accidental cheaters, whereas in precautionary contracts (such as "if you work with dogs, then you need a rabies vaccination"), intentional and unintentional cheaters are detected to an equal degree.⁸ This ability was predicted by Fiddick, using his assumption that there are two separate innate circuits in the brain, one for social exchange, where it is beneficial not to detect accidental cheating, and a separate one for precautionary measures, where it would be more beneficial to detect all cheating. If all were logical in the brain, you would be able to detect cheaters equally in both circumstances, independent of intent.

IT'S NOT ALL RATIONAL

Further evidence that all is not rational conscious decision making began with a Vermonter who lived in the 1800s. Phineas Gage was a railroad construction foreman who was hardworking, good at business, well mannered, civil, and respected. One September morning in 1848 he set off to work, not knowing he was about to have a textbook example of a bad day and become the most famous neurological trauma survivor. That morning, rocks were to be blasted with gunpowder to clear a path for the tracks. A hole was drilled into the rock and filled with gunpowder. A fuse was to be laid, covered with sand, and tamped down with a long iron rod, and then the charge was to be detonated. Unfortunately, Phineas must have been distracted, because he tamped down the gunpowder before the sand had been added, and the gunpowder exploded, blasting the tamping iron on a trajectory through Gage's head. It entered at the left cheek, passed through his eye socket, through portions of his frontal lobes and out the top of his skull, landing about twenty-five to thirty yards behind him.

This was no pixie-stick-sized rod. It was three feet seven inches long, weighed thirteen and a half pounds, and measured one and a quarter inches in diameter at one end, tapering over a distance of about one foot to a diameter of a quarter inch at the other. It can be seen at the medical museum at Harvard. It seems unbelievable, but Gage was unconscious for only about fifteen minutes and then was able to speak coherently and rationally! He was reported the next day by the local paper to be pain free.⁹ Through the ministrations of his doctor, John Martyn Harlow, he survived the injury and subsequent infection, and was able to return home to Lebanon, Vermont, after two months, though it took much longer to recover his stamina.

Although this is story enough, it is not why he has become famous. Phineas Gage had changed. His memory and reason were the same, but his personality was light-years away from that of the affable man he had been. "He was now fitful, irreverent, and grossly profane, showing little deference for his fellows. He was also impatient and obstinate, yet capricious and vacillating, unable to settle on any of the plans he devised for

future action. His friends said he was 'No longer Gage.'¹⁰ He no longer acted in a socially acceptable way. There was some chunk of brain that had been damaged that caused this change, even though his reasoning and memory were unaffected.

More recently, Antonio Damasio and his colleagues have had a series of "Gage-like" patients with similar lesions (although as a result of surgery or trauma rather than tamping rods), and they all have something in common. They too are no longer themselves and have lost their ability to act in a socially accepted way. The first was a patient named Elliot,¹¹ who had a tumor removed from his frontal lobes. Before the surgery, he was a responsible husband, father, and employee. A few months later, his life was in shambles. He had to be prodded to get out of bed, he couldn't manage his time at work, he couldn't plan for the immediate or distant future, his finances were a mess, and his family had left him. He had seen several doctors who did not know what to make of him, because all the tests he had taken showed his brain was functioning well. He scored above average on intelligence tests, and when presented with problems, he could come up with well-thought-out lists of possible solutions. His sensory and motor skills were unchanged, as were conventional memory, speech, and language. However, Damasio noticed that he showed a flattened affect, that is, his emotions, both primary and social, were severely impaired.

Elliot could no longer function in a socially accepted way. He had a difficult time making appropriate decisions, and Damasio hypothesized that the reason was that he no longer had emotions. He proposed that before we make a decision, when an option presents itself, an emotional response is evoked. If it is a negative emotion, the option is eliminated from consideration before rational analysis begins. Damasio proposed that emotions play a major role in decision making, and that the fully rational brain is not a complete brain. These findings have contributed to a grand reevaluation of the contributions of emotions to the decision-making process. It turns out that no matter how many rational ideas a person is able to come up with, emotion is necessary to make the decision, and that includes deciding on moral dilemmas.

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MAKING DECISIONS

People make decisions all day long. *Should I get up now or doze a while longer? What should I wear today? What should I have for breakfast? Should I exercise now or later?* So many decisions, you don't even realize you are making them. As you drive to work you are deciding when to put your foot on the accelerator, the brake, and perhaps the clutch. You are also adjusting your speed and your route to get to work on time, turning the radio dial, and perhaps talking on your cell phone. The interesting and scary thing is that your brain can think consciously about only one thing at a time. All those other decisions are being made automatically.

There are two types of automatic processes. Driving is an example of intentional (you have the intention of driving to work) and goal-directed (get to work on time) processes that have been learned over time until they become automatic; so is playing the piano or riding a bicycle. The second type is preconscious processing of perceptual events: You perceive a stimulus by seeing, hearing, smelling, or touching, and your brain processes it before your conscious mind is aware that you have perceived it. This takes place effortlessly and without intention or awareness. It turns out that what this automatic processing is doing is placing all your perceptions on a negative (the room is white, I don't like white) to positive (the room is brightly colored, I like bright colors) scale and biasing your decisions one way (something about this place isn't calling to me . . . let's keep looking) or the other (I bet this place is good, let's eat here). Your automatic processing is helping you to answer the evolutionarily significant question, "Should I approach or avoid?" This is called *affec-tive priming*, and it affects your behavior. If I asked why you don't want to eat at the first place, you will give a reason, but it most likely won't be "I get a negative flash in a white room." It would more likely be "Oh, it just didn't look all that exciting."

John Bargh at New York University has placed volunteers in front of a computer screen and told them that he would flash words on the screen. They were to tap a key with their right hand if they thought it was a bad word (such as *vomit* or *tyrant*) or tap a key with their left hand if it was a

good word (such as *garden* or *love*). What they didn't know was that he was also flashing words on the screen for a hundredth of a second (too fast for them to consciously realize) before he would flash the word they were to judge. What happened was, if he flashed a negative word on the screen first, followed by a negative word the volunteer was aware of, the volunteer responded faster than if he had not been primed. If a good word was flashed after the negative word, he would take longer to tap the key, because more time was required to adjust from the subliminal negative impression.¹² Bargh has later shown that if he exposed subjects to words describing rude behavior and then instructed the subjects to tell someone in another room when they were done, they were more likely to interrupt that person to tell them (66 percent of participants) than if they had had no affective priming (38 percent), and they were less likely to interrupt if they had been primed with polite words (16 percent).¹³

Error management theory predicts that one should be biased toward committing errors that are less costly.¹⁴ In thinking about evolution, one would postulate that those who survived were those who reacted more quickly, that is, automatically, to a negative cue, and a negativity bias should have been selected for. After all, it is more important to detect something that will hurt, kill, or make you sick than it is to react to seeing a bush with berries on it. There will always be another bush, but *not if you are killed by that lion*. Well, we do have a negativity bias! Big time. Subjects will pick angry faces out of a neutral crowd faster than happy faces.¹⁵ One cockroach or worm will spoil a good plate of food, but a delicious meal sitting on top of a pile of worms will not make the worms edible. And extremely immoral acts have an almost indelible negative effect: Psychology undergraduate students were asked how many lives a person would have to save, each on individual occasions and each at risk to his or her own life, to be forgiven for the murder of one. Their median response was twenty-five.¹⁶

This negativity bias has been documented and reviewed by Paul Rozin and Edward Royzman at the University of Pennsylvania, who tell us that it appears to be ubiquitous in our lives. Negative stimuli raise blood pressure, cardiac output, and heart rate.¹⁷ They grab our attention (newspapers thrive on bad news). We are better able to read negative than positive emotions in other people. The negativity bias affects our moods, our way of forming impressions of people, our search for the perfect (one tiny

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smudge in a rare book will bring down its value), and our moral judgments. We even have a greater number of negative emotions, and we have more words for pain than for good sensations.¹⁶

Rozin and Royzman have suggested that the adaptive value of the negativity bias has four components:

1. Negative events are potent. You can be killed!
2. Negative events are complex. Should you run, fight, freeze, or hide?
3. Negative events can happen suddenly. There's a snake! There's a lion! And they need to be dealt with quickly—a good reason that faster automatic processing would have been selected for.
4. Negative events can be contagious—spoiled food, dead bodies, sick people.

Earlier, when we discussed emotions, we learned that incoming information passes first through the thalamus, then to the sensory processing areas, and then to the frontal cortex. However, there was a shortcut through the amygdala, which responds to patterns that were associated with danger in the past. The amygdala not only affects your motor system but also can change your thinking. Your quick emotional response of fear or disgust or anger to the threatening (negative) incoming information will color how you process further information. It concentrates your attention on the negative stimulus. You aren't thinking the mozzarella looks fresh, the basil is fragrant, the tomatoes are red and juicy; you are thinking, *Yuck, there is a greasy hair on my plate, and I am not going to eat this. In fact, I'm never eating here again.* This is our negativity bias.

There are some things that affect us in a positive manner, although there is no equivalent to the emergency status given to negative stimuli. One of these effects is with unconscious mimicry. Bargh and Tanya Chartrand have found that people who were assigned to do a task with a stranger were more likely to like the stranger, and find their interactions to be smoother, when the stranger copied their mannerisms. They also tended to mimic the mannerisms of the stranger without later being aware they had.¹⁸ The researchers hypothesize that automatic mimicry increases liking and serves the purpose of facilitating social

interactions. When you first meet someone, you get an impression, and these first impressions are usually almost identical to ones formed with longer contact and observation.¹⁹ In fact, different observers will have a remarkably similar rating of a stranger's personality, and that rating is in remarkable agreement with the stranger's self-rating of those personality traits.²⁰

Mimicry is what makes a newborn baby copy his mother's expressions, sticking out his tongue when she does and smiling when she does. A related positive effect is that people tend to agree with others whom they like²¹ (your friend tells you her neighbor is a jerk, so you will tend to agree), unless agreement leads to conflicts with what the person already knows (you know her neighbor personally and think she is nice). Even your physical position will unconsciously affect your bias. People like novel stimuli better if their arms are flexed (accepting) than if they are extended (pushing away).²² In one study, half the subjects pulled a lever toward them if a word was positive, or pushed it away if it was negative, and the other half did the opposite. The subjects reacted faster to positive words if they were pulling the lever. Experimenters tried it again with just pushing for all words, or pulling for all words, and the reaction time was faster if the pushers saw a negative word than if they saw a positive word, and it was opposite for the pullers; their reaction was faster for the positive words.²³ All decisions we make are based on whether to approach or withdraw, including our moral decisions. If it is good, we approach; if it is bad, we withdraw; and these decisions are affected by the bias mechanisms, which in turn can elicit emotions that come as standard equipment from the baby factory.

THE NEUROBIOLOGY OF MORAL JUDGMENTS

Now try this scenario, known as the trolley dilemma:

A runaway trolley is headed for five people, who will be killed if it proceeds on its present course. The only way to save them is to hit a switch that will turn the trolley onto an alternate set of tracks where

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it will kill one person instead of five. Should you turn the trolley in order to save five people at the expense of one?

If you are like most people, you will say yes, it is better to save five than one.

Now try this one:

As before, a trolley threatens to kill five people. You are standing next to a large stranger on a footbridge crossing above the tracks, between the oncoming trolley and five workmen on the tracks below. Pushing the large stranger off the bridge and onto the tracks below will stop the trolley. He will die if you do this, but the five workmen will not be killed. Should you save the five others by pushing this stranger to his death?²⁴

Most people will answer no to this one. Why this dichotomy, when the actual numbers are no different in the two dilemmas? What is your interpreter saying now?

Joshua Greene, a philosopher-turned-neuroscientist at Harvard, thinks it is because the first scenario is more impersonal. You push a button and have no physical contact. The second one is personal. You actually have to physically push the stranger off. Greene looks to our evolutionary environment to solve this problem. Our ancestors lived in an environment of small social groups whose members were known to each other and whose dealings were regulated by emotions and were all on a personal level. It would then make sense that we should have evolved a hardwired emotional response to personal moral dilemmas, a response selected for survival or reproductive success. Indeed, when he used fMRI to look at areas in the brain that were being used in the above dilemmas, Greene found that with the personal dilemma, the brain areas associated with emotion and social cognition had increased activity. Dilemmas that were impersonal were not a part of the ancient environment, so when faced with the impersonal dilemma, the brain has no default reaction and has to resort to actual conscious thinking. With impersonal dilemmas, areas associated with abstract reasoning and problem solving showed increased activity.²⁵

Marc Hauser, however, thinks there are too many other variables in these dilemmas to narrow it down to personal versus impersonal. The results can also be explained in terms of a philosophical principle that it is permissible to cause harm as a by-product of achieving a greater good, but not to *use* harm to achieve it²⁶—which is to say, the means don't justify the ends. This is then discussing action based on intent. The intent in the first is to save as many as possible; the intent of the second is not to harm the innocent bystander.

Perhaps we can say it like this: Flipping the switch is emotionally neutral, neither good nor bad. So we get no help from intuitive bias or emotion; we then think about the problem rationally: One dying and saving five is better than five dying and saving one. In the second dilemma however, pushing an innocent person off a bridge is not emotionally neutral. It feels bad: Don't do it. Indeed, if you were the large person, the idea of jumping off the bridge yourself most likely would never even enter your head. Very bad. Jana Borg and colleagues, at Dartmouth College, decided to explore further. They found that the posterior superior temporal sulcus (STS) is used for the harder personal scenarios, and for the easy ones, the anterior STS. They postulate that the posterior STS may be used in thought-provoking, first-time scenarios, and the anterior portion may be more involved in previously resolved, more routine decisions.²⁷

ACTION VERSUS NO ACTION

We began by observing that we can make a moral judgment quickly, automatically. Even though we may not be able to explain it logically, we will keep on trying. In incest avoidance, we saw an example of hard-wired behavior that we consider moral. In the trolley dilemma, we have seen that moral judgments are not completely rational. They depend on the circumstances (automatic bias, personal or impersonal situations). They depend on whether action or no action is required. They also depend on intent and emotions (Damasio's patient Elliot). We have found that some automatic pathways are learned over time (driving), and some are inherent (approach-avoidance with a negativity bias). The latter

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can be affected by emotions, which also have been hardwired to varying degrees. Now we need to know a bit more about how the brain works.

It was thought in the past—and some still think so today, although their numbers are dwindling—that the brain is a general-purpose organ that can work on any problem with equal ability. If this were true, though, we should pick up molecular biology as easily as we learn to talk, and we definitely should not be able to figure out the great evolutionary psychologist Leda Cosmides' social-exchange questions better than we do logic questions. It appears our brains have neuronal circuits that have developed over evolutionary time that do indeed do specific jobs.

The concept of a brain with specialized circuits for specific problems is called the *modular brain theory*. I first wrote about this years ago in *The Social Brain*. It seemed logical, considering how most neuropsychological knowledge at the time emphasized how focal brain lesions produced discrete and specific deficits in patients. If a specific part of the brain is damaged, there are specific disorders of language, thought, perception, attention, and so on. And nowhere were such phenomena more dramatic than in split-brain patients, proving that the left side of the brain is specialized for one set of capacities and the right side for another kind.

More recently, the idea of modularity has been augmented by evolutionary psychologists. Cosmides and Tooby, for example, define modules as "units of mental processing that evolved in response to selection pressures." Yet, from considering the neurologic literature, it is clear that modules are not like isolated cubes stacked up neatly in the brain. Modern brain imaging studies have shown that the circuits for these modules can be widely scattered. And modules are defined by what they do with information, not by the information they receive (the input or stimulus that triggers them). Clearly, over evolutionary time, these modules evolved to react in specific ways to specific stimuli in the environment.

But our world has changed too fast for evolution to keep up with it. More types of information are going in, but the modules are still triggered in the same old ways. Although the range of stimuli is broader, their automatic responses still occur.

Furthermore, the brain is constrained. There are things it just cannot do, cannot learn, and cannot comprehend. For the same reason, a dog

cannot comprehend that, or why, you care so much about the Gucci shoes he just chewed up—after all, leather is leather—but he is getting the general feeling that maybe it was a bad move. There are some things the brain learns in just one try, and there are some things that take many attempts. The idea that the brain can't do everything is a hard concept, since it is difficult to conceive of things our brain can't grasp. Like, please explain the fourth dimension again, and that thing about time not being linear. The brain is basically lazy. It will do the least amount of work it can. Because using intuitive modules is easy and fast and requires the least amount of work, that is the default mode of the brain.

What is being proposed now by many researchers studying morals and ethics¹ is that we have modules that have evolved to deal with specific circumstances common to our hunter-gatherer ancestors. They lived in a social world made up of groups mostly of related people. Occasionally they met up with other bands of people, some more closely related than others, but they all needed to deal with the problems of survival, which included eating and not being eaten. Since this was a social world, the specific circumstances they often had to deal with involved other individuals, and some of these circumstances involved what we consider to be moral or ethical issues. These modules produce specific intuitive concepts that have allowed us to create the societies we live in.

ETHICAL MODULES: WHAT ARE THEY? WHERE DO THEY COME FROM?

The proposal is that a stimulus induces an automatic process of approval (approach) or disapproval (avoid), which may lead to a full-on emotional state. The emotional state produces a moral intuition that may motivate an individual to action. Reasoning about the judgment or action comes afterward, as the brain seeks a rational explanation for an automatic reaction it has no clue about. This includes moral judgments, which are not often the result of actual moral reasoning. Occasionally, however, the rational self does truly participate in the judgment process.

Marc Hauser points out that there are three possible scenarios for intuitive processes. At one end of the spectrum of opinion are those who

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believe there are specific inborn moral rules: It is wrong to kill, steal, or cheat; it is good to help, be fair, and keep promises. On the opposite end of the argument, some maintain that we are born with no intuitions, just the proverbial blank slate, an ability to learn moral rules. Thus you could just as easily learn that cheating and incest are good and fairness is wrong. Then there is the middle position, which Hauser favors, believing we are born with some abstract moral rules and a preparedness to acquire others, just as we are born with a preparedness to acquire language. Thus our environment, our family, and our culture constrain and guide us to a particular moral system, as they do to a particular language.

From what we have seen so far, the middle path seems the most likely. To find where these abstract moral rules come from, Hauser looks at common behaviors we share with other social species, such as being territorial; having dominance strategies to protect territory; forming coalitions to garner food, space, and sex; and reciprocity. Social reciprocity, having been taken by humans to heights unheard of in the animal world, provides a treasure trove in the search for abstract moral rules. The specific circumstances needed for social reciprocity to exist, as shown by researchers in game theory, require not only that the cheaters be detected but also that they be punished. Otherwise, cheaters, who invest less but receive an equal benefit, will outcompete the noncheaters and take over. If cheaters take over, reciprocity crumbles. Humans have evolved two abilities that are necessary for *prolonged* reciprocal social exchange: the ability to inhibit actions over time (that is, delayed gratification) and punishment of cheaters in reciprocal exchange. These currently are on the short list of uniquely human capacities.²⁸

Haidt and his colleague, Craig Joseph at Northwestern University, have come up with a list of universal moral modules* after comparing research on human universals, cultural differences in morality, and the precursors of morality in chimpanzees. Their findings also derive from the similar set of common behaviors that Hauser uses, but they add one class of abstract intuitions that are derived from the uniquely human

*They define modules as little bits of input-output programming, ways of enabling fast and automatic responses to specific environmental triggers.

emotion of disgust. Their five modules are reciprocity, suffering, hierarchy, boundaries between in-groups and out-groups (coalitions), and purity.^{29, 30} Not everyone will agree on these, but as Haidt and Joseph point out, they cover the wide range of moral virtues, which they define as characteristics of a person who is considered morally praiseworthy. Their list encompasses moral concerns in the world's cultures, not just Western cultures.

All such lists provide us with avenues of study. They aren't by any means definitive. Virtues are not universal. They are what a specific society or culture values as morally good behavior that can be learned. Various cultures emphasize various aspects of the above five modules, and this is what drives cultural differences in morality. This is the part of Hauser's middle path that is influenced by society. Richard Shweder, an anthropologist at the University of Chicago, proposes three areas of moral concern: the ethic of autonomy, which is concerned with an individual's rights, freedoms, and welfare; the ethic of community, which is concerned with protecting families, communities, and nations; and the ethic of divinity, which is concerned about the spiritual self and physical and mental purity.³¹ Haidt and Joseph favor a similar schema: They place the concern for suffering and reciprocity under the ethic of autonomy, the concern for hierarchy and coalitional boundaries under the ethic of community, and the concern for purity under the ethic of divinity.

I will address these separate modules, the input that activates them (the environmental trigger), the moral emotions that they elicit, and the moral intuition (the output) that results. As Damasio surmised, emotions are the catalyst, and they help us to explain why all is not rational in the world. Although on the surface it may seem that a fully rational world would be a better one, however, on just a quick look, we can nix that idea. For instance, the classical question in economics is why ever leave a tip in a restaurant that you will never go back to? That is not rational. Why not dump your sick husband or wife and get a healthy one? That would be more rational. Why spend public money on the severely handicapped, when they will rarely be able to repay it?

Haidt also makes the point that moral emotions aren't just for being nice. "There is more to morality than altruism and niceness. Emotions that motivate helping behavior are easy to label as moral emotions, but

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emotions that lead to ostracism, shaming, and murderous vengeance are no less a part of our moral nature. The human social world is a miraculous and tenuous co-construction of its participants, and any emotion that leads people to care about that world, and to support, enforce, or improve its integrity should be considered a moral emotion, even when the actions taken are not 'nice.'"³²

Oddly enough, Robert Frank, an economist, stepped into the world of the psychologists, philosophers, and the selfish gene. He suggests that moral sentiments are consistent with the selfish-gene theory. It can be to a selfish person's advantage to have moral sentiments that are visibly expressed by moral emotions, which predispose him not to cheat. Moral emotions, which are difficult to counterfeit, advertise that you have a conscience and would suffer uncomfortable feelings of guilt if a promise were broken. For instance, you know you can trust what the infallible blusher tells you. She cannot tell a lie without turning beet red. Humans are the only animal that blushes. Another visible sign of an emotion are tears. Humans are the only animal that cries. Although other animals have tear ducts, they produce tears only to keep the eye healthy. They do not produce tears with emotions.

Moral sentiments and emotions can be a commitment device that allows potential partners in trade or social exchange to get past the first round of exchange without cutting and running.³³ In short, they solve the commitment problem in personal relationships and in social exchange, which is: Why would anyone ever go into partnership with someone else in the first place? A rational person would never go into partnership with someone else because of the high probability that the other rational person would cheat, because if the opportunity presented itself, there would be no rational reason not to. How could you ever convince another rational person that you wouldn't cheat? It doesn't make sense not to.

Why would any rational person get married when they read the divorce rate or when they can have sex with innumerable others without the expense? Why would you ever start a business with someone? Why would you ever lend anyone money? Emotions solve the problem. Love and trust can lead to marriage, trust to partnerships. The fear of feeling guilt or shame prevents you from cheating, and you know (because of your theory

of mind) that your partner would also feel the same way. Anger and rage against a cheater is a deterrent. Possessing a theory of mind allows one to plan one's actions, taking into account how they will affect the beliefs and desires of another. If you cheat someone, they will get angry and retaliate. You don't want to feel the embarrassment when the other person finds out, nor do you want the retaliation, so you don't cheat.

One type of moral emotion, however, is not limited to a single module, as we will soon see. Here is an overview of the five moral modules most commonly postulated.

The Moral Modules

THE RECIPROCITY MODULE

Social exchange is the glue that holds societies together, and it is emotions that hold social exchange together. It is probable that many of the moral emotions arose in the context of reciprocal altruism and have precursors that can be seen in infants and other animals. If you recall, in order for social exchange to work, social contracts have to be made and honored. These take the form, *If I do this for you, then you will do an equal amount for me sometime in the future*. Robert Trivers, who helped us out in the previous chapter by explaining kin altruism, believes when looking at reciprocal altruism that emotions are what mediate between our intuitions and behavior. We will engage in reciprocity with those we trust, and we trust those who reciprocate. Individuals who didn't like being cheated and did something about it, and individuals who felt guilty if they cheated and didn't like that feeling, were the ones who were necessary to allow reciprocity to exist—by creating a society in which the honest would not be outcompeted by cheaters. Although there is evidence that reciprocity exists in a few other animals such as vampire bats and guppies, it exists only on a one-to-one basis. Humans will gossip and tell others who is a violator and who is trustworthy.

The moral emotions connected with reciprocity are sympathy, contempt, anger, guilt, shame, and gratitude. Sympathy can start the ball rolling by motivating an exchange. "Sure, I'll help you out." Anger urges you to punish cheaters; it is a reaction to unfairness and can motivate

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y are sympathy, con- hy can start the ball you out." Anger urges ess and can motivate

revenge. Contempt is looking down on people who haven't pulled their weight or measured up to their self-proclaimed ideals, and feeling morally superior to them. Contempt for a person weakens other emotions, such as compassion, making future exchanges less likely. Gratitude results from the exchange but is also felt toward those who detect cheaters. The automatic processing of the reciprocity module is saying, *Pays his debts, cooperates, and punishes cheaters: good, approach, or Cheats: bad, avoid.* The virtues that have been derived from intuitive reciprocity are a sense of fairness, justice, trustworthiness, and patience. However, reciprocity is not built on an innate sense of fairness; it is built on an innate sense of reciprocity.

Two university professors sent Christmas cards to a list of people they didn't know. Surprisingly, they received return cards from most of those people, and most didn't even ask who they were.³⁴ Charity organizations have found that they can double their donations when they give a little something along with their request for money, such as return-address stickers. Reciprocity is a strong instinct, but although fairness is a virtue that derives from it, it is not the master. Vernon L. Smith, a Nobel Prize winner in economics and currently professor of economics and law at George Mason University, has demonstrated this.^{35, 36, 37} There is a research game called the ultimatum bargaining game. You give Dave a hundred dollars and tell him to share it with Al. Dave has to say beforehand how much he is going to give Al. If Al refuses the offer, neither gets anything. The rational offer would be to offer Al one dollar. Al should accept it because he comes out ahead. But people who are offered a low amount in these games do not accept the offer. It makes them mad and the punishment they dole out is to refuse it. Both sides lose.

Most people who play the ultimatum game offer fifty dollars. This would make you think that fairness is what is going on. However, in a group of college students, if you vary the game a bit so Dave has to earn his position by scoring in the top half of the class on a general knowledge test, and Al has to accept whatever he is offered (this is now known as the dictator game), behaviors change. Daves are less generous. They no longer offer half, as they had in the ultimatum game. If Dave thinks his identity is not known to Al, he is again less generous. If Daves think the experimenter doesn't know their identity, 70 percent of

them don't offer *any* money to Al in the dictator game. The results led Smith to conclude that it is as if the Daves don't think they'll be asked back if they are *known* not to play in a socially acceptable manner. Fairness is obviously not the motivation in these games, whereas opportunity is. Smith argues that the reason Daves act fairly in the original ultimatum game is that they are obsessed with reciprocity and want to maintain their personal reputation, but when their identity is not known or they have a higher status, fairness is not the issue.

Smith tweaked his game again by having Dave and Al play a *series* of games, not just one. Dave and Al can pass or take the cash on each turn, and the amount grows with each pass. Eventually, the game ends if neither has opted to take the cash by a certain point, and Dave gets the cash. If all were rational, Al should figure that he should take the cash on his last turn, and Dave should figure that Al will do that, so Dave should take it on his second-to-last turn, and so on and so on, so that the rational person should take the cash on his first opportunity. But the students don't. They let Dave take it on the last round, and hope for reciprocal generosity on the next round. This is Robert Frank's commitment model. Both parties know each other and are playing a series of games.

These studies have been extended to the world beyond college students. The games were played with fifteen small-scale societies on four continents and in New Guinea. Although the results were more widely varied (lowball offers were more readily accepted in some societies and not in others), the researchers concluded that in none of the societies did people play with a completely selfish behavior. How they played varied with how important local cooperation was and how dependent they were on marketing and trading goods. The individual player's personal economic status or demographic had no effect, and the play patterns pretty much resembled their everyday interactions.³⁸ The more the society engaged in reciprocal trade beyond their kinship ties, the more equitable the offers were.

THE SUFFERING MODULE

A concern for suffering, or a sensitivity to or a dislike of signs of physical pain in others, and a dislike for those who cause the pain, is a good adaptation for a mother raising an infant who has a long period of depen-

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dency. Any adaptation that increases the offspring's chance of survival would have been selected for, and an ability to detect suffering in one's offspring fits this criterion. Sympathy, compassion, and empathy most likely have their distant origins in mimicry, which result in mother-offspring bonding and attachment, which in turn tend to increase survival of offspring. The virtues Haidt concludes societies derive from this intuitive ethic are compassion and kindness, but we could add righteous anger.

THE HIERARCHY MODULE

Hierarchy has to do with navigating in a social world where status matters. We evolved in social groups that were rife with dominance and status, both social and sexual. Our cousins the chimps are forever concerned about rank and dominance, and so are humans. Even in egalitarian societies, hierarchy exists in social status, work organizations, and sexual competition. No matter how egalitarian the society, some individuals will be more fit, more attractive, and thus ranked higher by the opposite sex. And somebody has to run the committee meetings, or chaos ensues. Intuitive behaviors that led to maneuvering this social web by being respectful to dominants or wielding power with aplomb would have been successful. We saw how the emotions of guilt and shame worked in social exchange, but they can also nudge one to act in a socially acceptable way, helping one navigate the hierarchical social world. Guilt is the belief that one has caused harm or suffering and can motivate helpful behavior, especially if one is caught in a reprehensible act, whereupon guilt becomes shame. Shame is violating a social norm knowing that someone is watching. It motivates one to hide or withdraw, which indicates that one understands the violation and is less likely to be attacked for committing it. Guilt and shame can be motivators for all the moral modules. Embarrassment is often felt around people of higher status. It motivates one to present oneself properly and show respect for those in authority, thus avoiding conflict with more powerful individuals, increasing the odds of survival. We learned in the last chapter that the reward for those who punished cheaters was increased status. Other emotions that are associated with hierarchy are

respect and awe, or resentment. Virtues based in hierarchy are respect, loyalty, and obedience.

THE IN-GROUP/OUT-GROUP COALITION MODULE

Coalitions are prevalent in chimpanzee society and among other social mammals, such as dolphins. They are endemic among humans, who organize themselves spontaneously into mutually exclusive groups. There are the sugar people and the salt people, farmers and herders, dog lovers and cat lovers. It is almost comic (if it didn't lead to so much tragedy) to look at an atlas of the world and see how many countries do not like their neighbors. Robert Kurzban, John Tooby, and Leda Cosmides have found evidence for a specialized module that codes for coalition recognition.³⁹ In an evolutionary world where kin groups live together, where hostile neighboring bands can be encountered, and where shifting power struggles erupt in social groups, it would be beneficial to be able to recognize patterns of cooperation, competition, and political allegiance. Visible markers that suggested who was allied with whom would be important. Arbitrary cues, such as skin color, accent, or manner of dress, would become significant only if they had predictive validity for coalitional membership. Otherwise they would be unimportant. The hunter-gatherer societies in which we evolved would rarely, if ever, have come into contact with groups of another race. They rarely moved more than a short distance. But race could be used as a coalition marker in the right circumstances because it is highly visible. In sociological tests in the past, people always categorized other people according to race, no matter what social context they presented.

To test if there might be a module that specialized in coalition recognition rather than race recognition, which did not make evolutionary sense, Kurzban, Tooby, and Cosmides created a social context in which race was not predictive of a cooperative alliance. They found this drastically decreased the extent to which subjects noticed race. They also demonstrated that any visual marker (they used shirt color) that is correlated with patterns of cooperation and alliance would be encoded, and in fact was encoded more strongly than race. It was only four minutes into their experiment when their subjects no longer noticed race. They

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concluded that people are good at picking up on changing patterns of alliance, and this is why they can adapt to different social worlds, one where race was not the coalition predictor.

Various emotions can be aroused by coalition membership: compassion for other groups (by Shriners and walkathon participants, for example), contempt for other groups (nonsmokers' feelings for smokers), anger (by nonsmokers against smokers), guilt (for not supporting your group), shame (for betraying your group), embarrassment (for letting "the team" down), and gratitude (house owners to firemen). So this module would work: *Recognized as part of my group: good, approach; not part of my group: bad, avoid*. Coalition recognition has its roots in mimicry; like mannerisms generate a positive bias. Virtues that are spawned from in-group coalitions are trust, cooperation, self-sacrifice, loyalty, patriotism, and heroism.

THE PURITY MODULE

Purity has its roots in defending against disease: bacteria, fungi, and parasites—what Matt Ridley considers the competition.⁴⁰ Without their threatening presence, there is no need for gene recombination or sexual (versus asexual) reproduction. We wouldn't have to keep up with the Joneses, or in this case the *Escherichia coli* or the *Entamoeba histolytica*, which are constantly mutating to get better at attacking us so they can reproduce and survive. Disgust is the emotion that protects purity. Haidt suggests that the emotion of disgust arose when hominids became meat eaters. It appears to be a uniquely human emotion.⁴¹ Obviously your dog doesn't feel it. Look what he eats. Disgust is only one of the four reasons that humans reject food, but we share the other three reasons with other animals: distaste, inappropriateness (a stick), and danger. Disgust implies the knowledge of the origins or the nature of food. Young infants will reject food that is bitter, but disgust doesn't appear until around age five. Haidt and his colleagues suggest that the emotion of disgust initially acted as a food rejection system, evidenced by its connection to nausea, concerns with contamination (contact with a disgusting substance), and facial expressions associated with it, which mostly use the nose and mouth. They refer to this as core disgust.

Initially, disgust would guard against disease transmitters, such as rotting corpses and carcasses, rotting fruit, feces, parasites, vomit, and the ill. Haidt suggests, "Human societies, however, need to reject many things, including sexual and social 'deviants.' Core disgust may have been preadapted as a rejection system, easily harnessed to other kinds of rejection."⁴¹ Its purview expanded, and at some point disgust became more generalized to include aspects of appearance, bodily functions, and some activities, including overindulgence and some occupations, such as those having to do with corpses.

But if disgust evolved to serve these important adaptive functions—food selection and disease avoidance—then it is particularly surprising that the disgust response is almost totally lacking in young children. Indeed, young children will put almost anything into their mouths, including feces, and the full disgust response (including contamination sensitivity) is not in place until around the age of five to seven. Contamination sensitivity is also not found, so far as we know, in any non-human species.* Caution is therefore warranted in proposing that disgust is important for biological survival. The social functions of disgust . . . may be more important than its biological functions.⁴¹

Indeed when the researchers had people from many different countries list things that they found disgusting, they could be grouped into three general categories beyond that of core disgust. The first category was things that reminded people of their animal nature, including death, sex, hygiene, all body fluids except tears (which only humans have), and body envelope violations such as a missing part, deformity, or obesity. The next category consisted of things that were thought to risk interpersonal contamination, which turns out to be less a form of body product contamination (people were only slightly less reluctant to wear laundered clothes of another) than of contamination of their essence. People were

*In order to be afraid of contamination, one must be able to conceive of invisible entities and to understand that appearance is not necessarily reality.

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more reluctant to wear the clothes of a murderer or of Adolph Hitler, than of a well-liked person. The majority of things listed as disgusting by people from India fell in this category. The last grouping was moral offenses. For American and Japanese subjects, the majority of disgusting things on their lists came from this category, although they were very different. Americans were disgusted at the violation of a person's rights and dignity, whereas Japanese were disgusted at violations to a person's place in society.

Disgust has a cultural component that varies among cultures, and children are coached as to what it includes. This module mostly likely had biological origins, which have widely expanded to include disgust that is not only elicited by food but now can even include the actions of others. Unconsciously this module would say, *Disgusting: dirty, bad, avoid; clean: good, approach*. I recently saw a sign that read, CLEAN HANDS MAKE GOOD FOOD. The purity module is alive and well in Santa Barbara.

Over the passage of time, religious and secular laws and rituals have been made regulating food and bodily functions, including hygiene, health, and diet. Once these laws are accepted, their violation results in a negative bias and a moral intuition. Other religious and moral concerns have been generalized to the purity of the mind and body. Many cultures make virtues of cleanliness, chastity, and purity.

Thalia Wheatley and Haidt⁴² have run an experiment to see if they could affect moral judgments by increasing an emotion. They hypnotized two groups of people and told one group that whenever they read the word *that*, they would be disgusted, and told the other group they would be disgusted by the word *often*. Then they had them read stories that had either one or the other word in them. Each group found the moral stories with their hypnotically suggested word in it more disgusting. They even found that one-third of people will judge a story with no moral violation in it somewhat morally wrong. Schnall, Haidt, and Clore tried a different approach by asking subjects moral questions while seated either at a dirty desk strewn with used fast-food wrappers and tissues or at a clean desk. People who had tested at the upper end of the scale for "private body consciousness" (those who are more aware of their physical state) made more severe moral judgments when sitting at

the dirty desk. A take-home lesson from this is that if you have had a forbidden party at your parents' house while they are gone for the weekend, be sure the house is spotless when they get home, because if they find out about it and the house is dirty . . .

So if we all have these universal modules, why are cultures so different in their moral standards? Haidt and Joseph answer this question by looking at the link between our innate moral intuitions and the socially defined virtues. In Hauser's model, we have an innate preparedness to respond to the social world in particular constrained ways. That means some things are easier to learn than others, and some things can't be learned at all. Studies on animals have shown that some things can be taught with just one trial, others can take hundreds of trials, and some can never be learned. The classic example for humans is the fact that it is very easy to be taught to be afraid of snakes but nearly impossible to be taught to be afraid of flowers. Our fear module is prepared to learn about snakes, which were a danger in our ancestral environment, but not flowers, which weren't. When you ask children what they are afraid of, the answer is lions and tigers and monsters, but not cars, which are very much more likely to hurt them nowadays. Likewise, some virtues are easily learned, whereas others are not. It is easy to learn to punish cheaters; it is difficult to learn to forgive them.

Virtues are what the culture has defined as morally praiseworthy. Different cultures value the output of the moral modules differently. Different cultures will link more than one module together so they apply to broader stimuli. Hindus have linked purity to hierarchy and coalitions and come up with a caste system. Monarchies have done much the same and ended up with a class system, royals keeping their bloodlines pure within a hierarchy of nobility. Cultures may define the virtues elicited by the different modules differently. Fairness is considered a virtue, but with what as its basis—fairness based on need? Or fairness based on those who work harder? Or fairness based on equal distribution? And consider loyalty. Certain societies value loyalty to family whereas others value loyalty to peer groups or a hierarchical structure, such as a town or country. In some cultures there may be complex virtues derived from different modules that are linked together to create a super virtue such

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THE RATIONAL PROCESS

With modules seemingly for almost everything, when does rational thinking kick in? Balzac marked the moment in *Modeste Mignon* with the statement "In love, what a woman mistakes for disgust is simply seeing clearly."⁴³ When this may happen is under debate at the current time. When are we motivated to think rationally? Well, we are motivated when we want to find the optimal solution. But what is the optimal solution? Is it the actual truth, or is it one that verifies how you see the world, or one that maintains your status and reputation?

Let us say you want the accurate actual truth unaffected by any bias you have. This is easier when moral interpretations are not at stake. For example, "I really want to know which medication is best for me, and I don't care how much it costs, where it came from, who makes it, how often I have to take it, or whether it is a pill, an injection, or a salve." That is a much less threatening question than "Is it OK to harvest organs from condemned felons?" The other condition is that we have enough time to think about it, so the automatic response doesn't kick in. On the spur of the moment, will you take one of the darling kittens being offered in front of the grocery store back to the apartment where you aren't allowed to have pets and your roommate is allergic to cat dander? Or do you go home and think about it? And of course, one has to have the cognitive ability to understand and use information that is pertinent.

Then again, even when we are trying to think rationally, we may not be. Research has shown that people will use the first argument that satisfies their opinion and then stop thinking. David Perkins, a Harvard psychologist, calls this the "makes sense" rule.⁴⁴ However, what people consider makes sense varies widely. It is the difference between anecdotal evidence (an isolated story that presumes a cause and effect) and factual evidence (a proven cause and effect.) For instance, a woman may believe birth control pills will make her sterile, because her aunt took birth control pills in the past, and now she can't get pregnant. Anecdotal

evidence, one story, was all she needed to support her opinion, and it made sense. However, she does not consider the possibility that her aunt may have been unable to get pregnant before she started taking the birth control pills, nor the possibility her aunt could have been infected with sexually transmitted bacteria, such as gonorrhea or chlamydia, that caused scarring in the Fallopian tubes—which in fact is the leading cause of infertility. She also does not know that using birth control pills will actually preserve her fertility better than nonhormonal methods (factual evidence). Predominantly, people use anecdotal evidence.^{45, 46}

Try this example, one of many that Deanna Kuhn, a psychologist at Columbia University, used to investigate knowledge acquisition:

Which statement is stronger?

- A. Why do teenagers start smoking? Smith says it's because they see ads that make smoking look attractive. A good-looking guy in neat clothes with a cigarette in his mouth is someone you would like to be like.
- B. Why do teenagers start smoking? Jones says it's because they see ads that make smoking look attractive. When cigarette ads were banned from TV, smoking went down.

In a large group of students ranging from eighth grade to graduate school, few understood the differences between the two types of argument these represented, although the graduate students did the best. The first is anecdotal, and the second is factual. The implications of this are that even if a person seeks to make a rational judgment, most people don't use information in an analytical manner.⁴⁷

Looking at our evolutionary environment, Haidt points out that if our moral judgment machinery were designed to always be accurate, the results could be disastrous if you occasionally sided with the enemy, against your friends and family.¹ He presents the social intuitionist model of moral reasoning. After the intuitive judgment and the post-hoc reasoning occur, Haidt suggests that there are four possible circumstances in which this intuitive judgment may be altered. The first two involve the social world either by reasoned (not necessarily rational) persuasion or by merely doing what everyone else is doing (again, not necessarily rational).

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He suggests rational reasoning has an opportunity to bloom when an issue gets discussed with another person.

Remember those social groups I talked about in the last chapter, in relation to gossip? And what does gossip accomplish? It helps set standards of moral behavior in a community. And what does everyone love to gossip about? Juicy tidbits, and the juiciest of all are moral violations. That will turn a desultory conversation into a hot one. It's much more interesting to learn that Sally is having an affair with a married man than to hear that she is having a party. You can feel righteous yourself, and agree with your friend that married men are off-limits, but what if you don't agree with your friend? What if you know that the man is married to a gold digger who married him for his money, they have no children, their house is now partitioned in two—she is on one side having extravagant parties, and he is on the other spending his spare time managing the Web site for the local United Way—and they have no contact, except for her refusing to sign divorce papers? Can you two have a rational discussion of facts and leave with someone having changed his or her mind?

It depends on how strongly your emotions have kicked in on the case. We have already learned that people will tend to agree with people they like, so if the issue is neutral or of little consequence, or if an argument hasn't already arisen, then social persuasion can come into play. These persuasive arguments may or may not be rational, as we just learned. You will use anything you think will persuade the other to your viewpoint. If the two of you have really strong reactions, then don't waste your time. And of course, really strong reactions are what are at stake with moral issues. There is a reason for the adage of not talking about religion or politics over a meal. Strong emotions lead to arguments, which are disruptive to the taste buds and lead to indigestion.

As Robert Wright puts it in his book *The Moral Animal*, "By the time the arguing starts, the work has already been done." In steps the interpreter, and the bad news is, your interpreter is a lawyer. Wright describes the brain as a machine for winning arguments, not as a truth finder. "The brain is like a good lawyer: given any set of interests to defend, it sets about convincing the world of their moral and logical worth regardless of whether they in fact have any of either. Like a lawyer, the human brain wants victory, not truth; and, like a lawyer, it is sometimes

more admirable for skill than for virtue."⁴⁸ He points out that one would think that if we were rational creatures, then at some point, we should wonder at the probability of always being right. Come to think of it, if we were all rational creatures, wouldn't we all use pocket protectors?

Persuasion can come in the form of merely being in a group of people. How many times have you thought people act like sheep? For instance, my daughter related her experience at the San Diego train station the day before Thanksgiving. The train was late arriving, and when it was finally available for boarding, only one of the several doors to the platform was standing open. A long line of people formed at that door. She walked to one of the closed doors and pushed it open and stepped onto the train. Many studies have been done to illustrate how people are influenced by those around them. The creators of the TV show *Candid Camera* did some of their most hilarious skits with this in mind.

Solomon Asch, a pioneer of social psychology, did a classic experiment. He set up a room of eight subjects (seven of whom were "plants") and showed them a line. After concealing that line, he showed them another line that was obviously much longer. He asked each person in the room if one of the lines was longer than the other, but asked the real subject last. If the first seven people all said the lines were of equal length, the majority of test subjects agreed with them.⁴⁹ Social pressure made a person say something that was obviously incorrect.

Stanley Milgram was a student of Asch. After receiving his doctorate in social psychology, he did some shock experiments that were truly shocking. No persuasion was involved here, just obedience. He told his subjects he was researching the effects of punishment on learning. However, what he was really researching was obedience to an authority figure. He measured the willingness of his subjects to obey an authority figure, the researcher, who instructed them to perform acts that conflicted with their consciences. He told his subjects they were randomly assigned to play either a teacher or a student role. The subject, however, was always assigned the teacher role. Milgram told the teacher to administer an electric shock to the student (who, unbeknownst to the teacher, was an actor playing the part) every time the student got an answer wrong on a word-matching memory task, and to increase the shock for each mistake. The actor was not actually shocked but pretended to be.

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The subject playing the teacher was told that real shocks were being given. The instrument panel on the shock machine read "slight shock" on one side of a dial and "severe shock" on the other, with numerical values from 0 to 30. Having previously asked people what they would do in such a circumstance, he expected most people would stop at a level of 9. However, he was quite wrong. The subjects continued shocking the student to an average intensity of 20 to 25, with or without prodding from the experimenter, even when the student was screaming or asking to leave. And 30 percent went to the highest-level shock even when the student was pretending to be listless or unconscious! If the teacher and student were in closer proximity, however, there was a 20 percent drop in obedience, suggesting that empathy encouraged disobedience.^{50, 51}

This study has been replicated in many countries. Obedience to the instructions has been universal in several countries where the studies have been replicated, but among the countries, it varied from Germany, where 85 percent were willing to send the highest levels of shocks, to Australia, where it dropped to 40 percent. This is an interesting finding, considering that modern Australia was originally populated by prisoners, a rather disobedient gene pool! In the United States, 65 percent followed the instructions. That may be good news for traffic laws, but we know where blind obedience leads.

Haidt's third possible scenario in which rational judgment is most likely to be used is what he refers to as the reasoned judgment link. In this instance, a person logically reasons out a judgment and overrides his intuition. Haidt suggests that this happens only when the initial intuition is weak and the analytical capacity is high. Thus, if it is a low-profile case, in which there is no emotional investment or only a little, the lawyer might go on vacation. If you are lucky, a scientist^{*52} covers for him—but don't count on it. If it is a high-profile issue, and the intuition is strong, an analytical mind can force logic on its owner, but he may end up with a dual attitude, with his intuition just below the surface. So just maybe, if it is a high-profile case, the scientist may sit in on the argument and later, while sipping a *digestivo*, nudge the lawyer to shut up already.

*The lawyer-scientist analogy was first used by Roy F. Baumeister and Leonard S. Newman.

The fourth possible scenario is the private reflection link. Here, a person may have no intuition at all about an issue, or might be mulling over the situation, when suddenly a new intuition hits her that may override the initial one. This can happen by imagining yourself on the other side of the issue. Then you are presented with two competing intuitions. However, as Haidt points out, is this really rational thinking? Aren't you right smack back in Damasio's lap needing an emotional bias to help you pick between the two?

MORAL BEHAVIOR

How much does all this matter? Does moral reasoning correlate with moral behavior? Do people who rationally evaluate moral behavior act in a more moral way? Apparently not exactly. There appear to be two variables that do correlate to moral behavior: intelligence and inhibition. Criminologists have found that criminal behavior is inversely related to intelligence, independent of race or social-economic class.⁵³ Augusto Blasi found that IQ was positively related to honesty.⁵⁴ In this context, inhibition basically refers to self-control or the ability to override an objective that your emotional system wants. You may want to sleep in, but you will get up to go to work.

Researchers headed by Walter Mischel, a psychologist at Columbia University, have been doing a very interesting long-term study on inhibition. They began with a study of preschoolers, using a food reward. One by one, children were seated at a table and asked which was better, one marshmallow or two. We all know what they answered. On the table were a marshmallow and a bell. The researcher (let's call her Jeanne) told the child (Tom) that she had to leave the room for a few minutes, and when she returned, he could have two marshmallows. However, if Tom wanted her to come back early, then he could ring the bell, but if he did that, she would give him only one marshmallow. Ten years later, the researchers sent questionnaires to the parents about their then adolescent children, and found that those who delayed eating the marshmallow longer in preschool were rated as more likely to exhibit self-control in frustrating situations, less likely to yield to temptation, more intelligent, and less

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distractible when trying to concentrate, and they earned higher SAT scores.⁵⁵ The team continues to follow these people today.

How does self-control work? How does one say no to a tempting stimulus? Why did some of those kids wait until the researcher returned while staring at the marshmallow? In the adult world, why are some people able to refuse the Death by Chocolate cake on the dessert tray, or drive at the speed limit while everyone is passing them?

In order to explain how that aspect of willpower, "the ability to inhibit an impulsive response that undoes one's commitment," aka self-control, works, Walter Mischel and his colleague Janet Metcalfe proposed that there are two types of processing. One is "hot" and the other is "cool"; they involve neural systems that are distinct but still interact.⁵⁶ The hot emotional system is specialized for quick emotional processing. It responds to a trigger and makes use of the amygdala-based memory. This is the "go" system. The cool cognitive system is slower and is specialized for complex spatiotemporal and episodic representation and thought. The researchers call it the "know" system. Its neuronal basis is in the hippocampus and the frontal lobes. Does this sound familiar? In their theory, they stress that the interaction of these two systems is of critical importance to self-regulation and to decision making in regard to self-control. The cool system develops later in life and becomes increasingly active. How the two systems interact depends on age, stress (under increasing stress, the hot system takes over), and temperament. Studies have shown that criminal behavior decreases with age,⁵⁷ giving support to the idea that the cool system that increases self-control becomes more active with age.

MORALITY-FREE HUMANS: THE CASE OF THE PSYCHOPATH

What about psychopaths? Are they different from most criminals or just way worse? Psychopaths appear different on neuroimaging studies.⁵⁸ They have specific abnormalities that can be differentiated from simply antisocial individuals and normal individuals. This suggests that their amoral behavior is due to specific malformations of the cognitive structure of the brain. Psychopaths exhibit high intelligence and

rational thinking. They are not delusional. They know the rules of society and of moral behavior, but a moral precept is just a rule to them.⁵⁹ They don't understand that it is OK to suspend the societal rule "Do not eat with your hands at the table," but it is not OK to suspend the moral rule "Do not spit in the face of the person next to you at the table." They have a measurable decrease in ectodermal response to emotionally significant⁶⁰ and empathetic stimuli⁶¹ compared with normal control subjects. They don't have the moral emotions of empathy, guilt, or shame. Although they do not show impulsive behavior in one sense, they do have a one-track mindedness that is not inhibited, which distinguishes them from normal individuals. It appears that they are born psychopaths.

PUTTING YOUR MONEY WHERE YOUR MOUTH IS

It has been hard to find any correlation between moral reasoning and proactive moral behavior, such as helping other people. In fact, in most recent studies, none has been found,^{62, 63} except in one study done on young adults, in which there was a small correlation.⁶⁴ As one might predict based on what we have learned so far, moral behavior, as evidenced by helping others, is more correlated with emotion and self-control. Interestingly, Sam and Pearl Oliner, professors at Humboldt State University and founding directors of the Altruistic Personality and Prosocial Behavior Institute, studied moral exemplars by looking at European rescuers of Jews during the Holocaust.⁶⁵ Whereas 37 percent were empathically motivated (suffering module), 52 percent were primarily motivated by "expressing and strengthening their affiliations with their social groups" (coalition module), and only 11 percent were motivated by principled stands (rational thinking).

The Religion Assumption

Where does religion fit in with all of this? If we have these moral intuitions we are born with, what's up with religion? Good question. But you

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have made an assumption. Haven't you assumed that morals came from religion and that religion is about morals? Religions have been around since the very beginnings of human culture, but in fact, only sometimes do they have anything to do with morality and the salvation of a soul. You might say "But my religion does, and it is true, and all the other ones are false." Why are you so special? Every other religion thinks the same thing. Think about the coalition in-group intuitive bias. Pascal Boyer, an anthropologist who studies the transmission of cultural knowledge at Washington University in Saint Louis, points out that it is a common temptation to search for the origin of religion in general human urges, such as the desire to define a moral system or explain natural phenomena. He attributes this to people's incorrect assumptions about religion and psychological urges. With our current research techniques, we are able to do better than just throw ideas about religion out into the wind; we can prove or disprove many of them. He has come up with a list of commonly posited reasons for the origins of religion, and he suggests a different viewpoint.⁶⁶

Do not say . . .

But say . . .

Religion answers
people's metaphysical
questions.

Religious thoughts are typically activated
when people deal with concrete situations
(this crop, that disease, this new birth, this
dead body, etc.).

Religion is about a
transcendent God.

It is about a variety of agents: ghouls, ghosts,
spirits, ancestors, gods, etc., in direct interac-
tion with people.

Religion allays anxiety.

It generates as much anxiety as it allays.
Vengeful ghosts, nasty spirits, and aggressive
gods are as common as protective deities.

Religion was created
at time *t* in human
history.

There is no reason to think that the various
kinds of thoughts we call "religious" all
appeared in human cultures at the same time.

(continued)

Do not say . . .**But say . . .**

Religion is about explaining natural phenomena.

Most religious explanations of natural phenomena actually explain little but produce salient mysteries.

Religion is about explaining mental phenomena (dreams, visions).

In places where religion is not invoked to explain them, such phenomena are not seen as intrinsically mystical or supernatural.

Religion is about morality and the salvation of the soul.

The notion of salvation is particular to a few doctrines (Christianity and doctrinal religions of Asia and the Middle East) and unheard of in most other traditions.

Religion creates social cohesion.

Religious commitment can (under some conditions) be used as a signal of coalitional affiliation, but coalitions create social fission (secession) as often as group integration.

Religious claims are irrefutable; that is why people believe them.

There are many irrefutable statements that no one believes; what makes some of them plausible to some people is what we need to explain.

Religion is irrational/ superstitious (therefore not worthy of study).

Commitment to imagined agents does not really relax or suspend ordinary mechanisms of belief formation; indeed it can provide important evidence for their functioning (and therefore should be studied attentively).

TABLE 1: Do's and Don'ts in the Study of Religion. From Pascal Boyer, "Religious thought and behavior as by-products of brain function," *Trends in Cognitive Sciences* 7, no. 3 (2003): 119-24.

When we talk about anything the brain believes or does, we have to go back to its structure and function. Religions are ubiquitous and thus are easy to acquire and transmit. They are tapping into modules that are used for nonreligious social activities but, as Marc Hauser said, are "prepared" to be used in other related ways. There is not just one part of the brain that is used in religious thought; there are many areas that come into play. People who are religious do not have a brain structure that atheists and agnostics do not have. But remember, the brain is also constrained. As Boyer puts it, there is a limited catalog of concepts; religion is not a domain where anything goes. For instance, in most religions, invisible dead souls are lurking somewhere, but invisible thyroid glands are not. Gods are either people, animals, or man-made objects with some ability beyond the normal, but otherwise they still conform to what we know about the world. A god has a theory of mind and may or may not have empathy, but a god would never be a pile of cow dung, for instance, or just a thumb.

People do not require the same standard of evidence for religion that they do for other aspects of their life. Why do people pick some parcels of incoming information and not others to use for their belief systems? What we have learned about bias and emotion should help us out with that. The analytical mind is rarely called in to help. Another interesting aspect has recently been teased out of some research subjects. What people *say* they believe and *believe* they believe, and what they *actually* believe, are two different things. Instead of the omnipresent, all-doing, all-knowing God that they say they believe in, when they are not focused on their beliefs, they use another concept of God that is humanlike. This God has serial attention (does only one thing at a time), a particular location, and a particular viewpoint.⁶⁷ Now that we know about the interpreter, why doesn't that surprise us?

Boyer says religions seem "natural" because "a variety of mental systems, functionally specialized for the treatment of particular (non-religious) domains of information, are activated by religious notions and norms, in such a way that these notions and norms become highly salient, easy to acquire, easy to remember and communicate, as well as intuitively plausible."⁶⁸ Let's look at our list of the moral intuitions and see how different aspects of religions can be seen as by-products of them.

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SUFFERING

That one is easy. Many religions speak to the relief of suffering, or wallow in it, or even seek to ignore it.

RECIPROCITY

Easy again. Many natural and personal disasters are explained as God's or the gods' payback for bad behavior, that is, punishing cheaters. Also, the social exchange is ubiquitous in religion: "If you kill a bunch of innocent infidels, then you will go to paradise and have seventy virgins at your beck and call." Does that work for women, too? Or "If you renounce all physical desires, then you will be happy." Or "If I do this rain dance perfectly, then it will rain." Or "If you cure my disease, then I will never do such and such again."

HIERARCHY

Easy again. We can look at status. The person with the (appearance) of the highest morals is given higher status and more trust. Gandhi was known to have been quite successful with the women (status). Popes ruled vast stretches of Europe at one time (status, power, hierarchy). And how about the Ayatollah? Many religions are set up with a hierarchical structure; the most obvious is the Catholic Church, but it is not alone. Many Protestant religions, Islam, and Judaism all have hierarchical structures. Even in primitive societies, the witch doctors held places of esteem and power in their communities. The Greek, Roman, and Norse gods also had hierarchical structures, as do the Hindu gods. God is the big cheese, or there is a top god, like Zeus or Thor. You get the picture. The virtues of respect, loyalty, and obedience all morph over onto religious beliefs.

COALITIONS AND IN-GROUP/OUT-GROUP BIAS

Does anyone really need this spelled out? As in "My religion is right (in-group); your religion is wrong (out-group)"—just like soccer teams. Reli-

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GROUP BIAS

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gion in its positive in-group form does create a community whose members help each other, as do many social groups, but in its extreme form it has been responsible for much of the killing in the history of the world. Even Buddhists are divided into rival sects.

PURITY

This too is obvious. "Uncontaminated food is good" has led to many religious food rituals and prohibitions. "Uncontaminated body is good" has led to certain sexual practices, or sex itself, being viewed as dirty and impure. How many primitive religions used virgins for sacrifice? We can start with the Aztecs and Incas and build. Women who have been raped are considered impure by the Muslim religion and are regularly murdered by their male relatives in the practice of "honor killing," a twisted combination of the purity and hierarchy modules. Buddhism has its "pure land" where all who call upon the Buddha will be guaranteed re-birth.

Has religion provided a survival advantage? Has it been selected for by evolution? Attempts to prove this have not been satisfactory because no one single characteristic has been found that generates religion, as we can see from Boyer's table. Natural selection, however, has been at work on the mental systems that religion uses or, as some think, parasitizes. Religions can be thought of as giant social groups with strong coalitions, often with hierarchical structures, and reciprocity based on notions of purity either of body, mind, or both. Giant social groups can have a survival advantage, whether they are based on religion or not. Ideology can strengthen coalitionary bonds, and that in itself can increase group survival. So are religions examples of group selection? This is a highly controversial question. D. S. Wilson points out that more is known about the evolution of the spots on a guppy than is known about the elements of religion.⁶⁹ This is a work in progress.

Can understanding how morality and religion came to be help us today? If we understand that our brain is a machine for hunter-gatherers in small groups, full of intuitive modules that react in certain ways, that it is not yet molded for huge societies, can that allow us to function better in our current world? It seems it can. Matt Ridley⁷⁰ gives the example

caused by the phenomenon known as the "tragedy of the commons," which was unfortunately misnamed by Garrett Hardin, a biologist. He apparently did not distinguish between open-access free-for-all and communally owned property. The phenomenon should have been named the "tragedy of the free-for-alls." Land that is free for all is subject to cheaters in social exchange. An individual would think, "If everyone can fish, hunt, and graze livestock on this land, then I should get as much as I can now, because if I don't, someone else will, and there will be none left for me and my family."

However, Hardin used grazing commons as his free-for-all example. What he didn't know was that most grazing commons were not free-for-alls. They were carefully regulated community property. Ridley points out that free-for-alls and regulated commons are two very different things. "Carefully regulated" means that each member owns a right to something, such as fishing in a particular area, grazing a set number of animals, or having specific areas to graze. Now it is in the owner's interest to maintain that area, which makes it possible to set up a long-term social exchange: "If I graze only ten sheep and you graze only ten sheep, then we will not overgraze the common, and it will sustain us for a long period." Cheating no longer becomes attractive.

Unfortunately, this misunderstanding of what was happening in much communal property led many economists and environmentalists in the 1970s to conclude that the only way to solve the cheating problem (which didn't even exist in many communal setups) was to nationalize communal property. Instead of several patches of communally managed lands, one huge government-managed patch was created. This has resulted in fisheries being overfished, land being overgrazed, and wildlife being overhunted, because the fisheries, land, and wildlife became a free-for-all on a grand scale. There were not enough enforcers to detect the cheaters, and only fools wouldn't take all they could while they could.

Ridley explains that this has been a disaster for the wildlife of Africa, where most countries nationalized their lands in the 1960s and 1970s. The wildlife was now owned by the government, and although it still did the same damage to crops and competed for grazing, it was no longer a source of food or revenue—except for poachers. There was no motiva-

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tion to protect it and every motivation to get rid of it. Officials in Zimba-
 bwe, however, realized what was happening. They gave ownership of the
 wildlife back to the communities, and presto, the attitudes of the locals
 toward wildlife changed, and the animals became valuable and worth
 maintaining. The amount of private land owned by the villagers now
 devoted to wildlife has doubled.⁷⁰

Elinor Ostrom, a political scientist who has studied well-managed lo-
 cal commons for years, has shown in the laboratory that groups, when
 allowed to communicate and develop their own methods of fining free
 riders, can manage communal resources almost perfectly.⁷¹ And it turns
 out that those things that can be managed are those things that can be
 owned. We are territorial, just like chimps and many other animals.
 Thus, understanding our intuitive reciprocity and its constraints, and the
 fact that we are most comfortable in smallish groups, can lead to better
 management practices, better laws, and better governments. This is just
 like understanding that the plant you bought that came from the desert
 should not be watered as if it came from the tropics.

DO ANIMALS HAVE A MORAL SENSE?

Now this is an interesting question. Of course when we humans ask it,
 we are asking it from our own perspective, and the implied question is
 really Do animals have a moral sense *like ours*? I have just presented the
 case that many stimuli induce an automatic process of approval (ap-
 proach) or disapproval (avoid), which may lead to a full-on emotional
 state. The emotional state produces a moral intuition that may motivate
 an individual to action. These moral intuitions have sprung from common
 behaviors we share with other social species, such as being territorial;
 having dominance strategies to protect territory; forming coalitions to
 garner food, space, and sex; and reciprocity. We share some aspects of
 this chain of events with other social species, and in fact we have the
 same emotional reactions, which we term moral, to some of the same in-
 citing stimuli. We get angry at property violations or attacks on our coali-
 tion, just as chimps and dogs do. So in that sense, some animals have an

intuitive morality that is species-based, centered on their own social hierarchies and behaviors, and affected by the emotions that they possess.

The differences lie in the wider range and complexity of moral emotions that humans have, such as shame, guilt, embarrassment, disgust, contempt, empathy, and compassion, and in the behaviors these have contributed to. The most notable of these behaviors is prolonged reciprocal altruism, of which humans are the undisputed grand masters, but humans can also indulge in altruism and expect no reciprocity. I know that all you dog owners are now going to tell me that your dog feels shame when you walk into the house and see that he has just chewed your new shoes. But to feel shame, embarrassment, or guilt, which Haidt calls the self-conscious emotions, an animal must have self-awareness beyond recognizing his visible body and be conscious of that self-awareness. We are going to talk more about self-awareness and consciousness in chapter 8, but the short version for now is that the presence of this expanded sense of self in other animals has yet to be discovered. Your scowl at the sight of the gnawed Guccis and your terse comment are what your dog is reacting to. The alpha animal is angry. The moral emotions of shame and embarrassment have their animal roots in submissive behavior but have become more complex. You recognize this submissive cowering in your dog and call it shame, but that is a more complex emotion than it is feeling. Its emotion is fear of a swat or of getting dragged off the couch, not guilt or shame.

But in humans there is something going on in addition to more complex emotions and their repercussions: the post hoc need to interpret the moral judgment or behavior. The human brain alone seeks an explanation for the automatic reaction that it has no clue about. This is the unique interpretive function of the human brain in action. I suspect that this is also the point where humans put a value judgment on their actions: good behavior or bad. To what degree the value judgment may match the emotional approach/withdraw scale is an interesting question. There are the occasions, however, when the rational self becomes an earlier participant in the judgment and informs the behavior. We humans can inhibit our emotionally driven responses. Then the conscious, self-aware mind steps in, bellies up to the bar, and takes command. That is a uniquely human moment.

CONCLUSION

David Hume and Immanuel Kant were both right in a way. As the neurobiology of moral behavior becomes fleshed out, we shall see that some of our repugnance for killing, stealing, incest, and dozens of other actions is as much a result of our natural biology as are our sexual organs. At the same time, we will also realize that the thousands of customs that people generate to live in cooperation with each other are rules generated by the thousands of social interactions we have every day, week, month, and year of our lives. And all of this comes from (and for) the human mind and brain.

One could say most of our life is spent battling the conscious rational mind and the unconscious emotional system of our brain. At one level, we know that by experience. In politics, a good outcome happens when the rational choice is consonant with the emotions of the time. A lousy political decision occurs when a rational choice is made at a time when the emotions of the populace are at odds with the projected outcome. On a personal level, it can go a different way. A poor personal decision can be the product of a powerful emotion overriding a simple rational directive. For all of us, this battle is continuing and never seems to go away.

It is as if we are not yet comfortable with our rational, analytic mind. In terms of evolution, it is a new ability that we humans have recently come upon, and we appear to use sparingly. But, using our rational mind, we have come across other uniquely human traits: the emotion of disgust and a sensitivity to contamination, the moral emotions of guilt, shame, and embarrassment, blushing, and crying. We have also found that religions are large social groups that have their foundation in the notion of purity of either mind or body, another uniquely human construct with its roots in the moral emotion of disgust. And the know-it-all interpreter is there, coming up with explanations for our unconscious moral intuitions and behaviors. And we have our analytical brain occasionally chiming in. Not only that, there is even more going on that we aren't conscious of. Stay tuned. . . .