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Strangers to Ourselves

Discovering the Adaptive Unconscious

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I do not hesitate to maintain, that what we are conscious of is constructed out of what we are not conscious of—that our whole knowledge, in fact, is made up of the unknown and incognisable.

—*Sir William Hamilton (1865)*

Outside consciousness there rolls a vast tide of life which is perhaps more important to us than the little isle of our thoughts which lies within our ken.

—*E. S. Dallas (1866)*

Consider for a moment how hard it is to describe the nature of conscious experience. It is difficult for the simple reason that we cannot observe conscious states directly in anyone but ourselves. How can I be certain that my subjective experience is like yours? We can try to describe our thoughts and feelings to each other, of course, but we have no way of knowing whether the words we use are referring to the same thing, as in the classic enigma of whether my experience of the color red is the same as yours.

Despite these conundrums, we can at least agree that there is a phenomenon to be understood. We know that there is such a thing as consciousness because we have all experienced it firsthand. Moreover, we can reach consensus about some of the contents of consciousness. Most of us

would agree that emotions are an important part of conscious experience, because we have all felt love, anger, and fear. We would agree that consciousness can involve a mental projection of images, because if someone said, "Think of a dachshund," we could easily do so. True enough, I have no way of knowing whether your mental image of a dachshund is anything like mine, but we could at least agree that we can both project such images in the theater of consciousness.

It is much more difficult to describe the adaptive unconscious, precisely because we do not experience it firsthand. If you said to me, "Think about the last time you made a nonconscious assumption about what another person was like," the best I could give you would be a blank stare. Describing the parts of our mind that are out of view is as difficult as describing the operation of our kidneys or pineal glands. Even more difficult, actually, because we do not have magnetic-resonance-imaging machines that can take pictures of the adaptive unconscious. Thus, the best way to begin describing the parts of our minds we cannot observe directly is perhaps to describe what it would be like to lose our nonconscious minds.

The Unconscious Takes a Holiday

Consider a man who awoke one Saturday morning with a terrible malady: the unconscious parts of his mind had stopped functioning, and he had only his conscious mind to guide his thoughts, feelings, and actions—an Aware Head, so to speak. How would he fare? If we had posed this question to René Descartes three centuries ago, he would have replied that this man's day would be like any other; what we are aware of is what we think, because there are no other mental processes. A surprising number of early twentieth-century psychologists (and even a few stubborn holdouts today) would agree, arguing that there is no such thing as unconscious thought. In honor of Descartes, we will call the person who has lost his nonconscious mind "Mr. D."

It would be immediately apparent that Descartes was wrong and that Mr. D.'s day would not be like any other, beginning with his attempt to

get out of bed. Humans have a "sixth sense" called proprioception, which is the sensory feedback they constantly receive from their muscles, joints, and skin, signaling the position of their bodies and limbs. Without knowing it, we constantly monitor this feedback and make adjustments to our bodies; for example, when we lift our left arm, we subtly shift some weight to the right side of our bodies to maintain our balance. If we didn't, we would list dangerously to one side.

In rare cases people lose their sense of proprioception, with grave consequences. The physician Jonathan Cole documented the case of Ian Waterman, a man who suffered nerve damage when he was nineteen and lost all proprioception. Mr. Waterman was like the straw man in the Wizard of Oz, newly released from his pole. If he tried to stand, he ended up in a heap of tangled limbs on the floor. As long as he focused on his arm or leg he could keep it still, but as soon as he looked away, it would start moving uncontrollably. With a great deal of courage and hard work, Mr. Waterman was able to regain some control of his body, by replacing his unconscious proprioception with conscious attention. He learned to walk, to dress himself, and even to drive a car by watching himself carefully with fierce concentration. He literally kept an eye on himself at all times, because he was in trouble if he lost sight of his body. One day he was standing in the kitchen and there was a sudden power failure, casting the room into darkness. Mr. Waterman immediately fell to the floor. Because he could not see his body, he could no longer control it.[1]

We are completely unaware of this critical sensory system. We can stand and close our eyes and keep our balance, with no awareness of how much mental work is involved. It is only the loss of the hidden proprioceptive system, as in Mr. Waterman's case, that demonstrates how important it is.

Proprioception is but one of many nonconscious perceptual systems. An important role of the nonconscious mind is to organize and interpret the information we take in through our senses, transforming light rays and sound waves into the images and noises of which we are aware. We see that the chair in our bedroom is closer to us than the bureau, with no idea of how our brains transformed the light rays striking our retinas

into a perception of depth. If these nonconscious computations were to cease, the world would look like a confusing jumble of pixels and colors instead of cohering into meaningful, three-dimensional images.[2]

In fact it makes little sense to imagine what it would be like to have only a conscious mind, because consciousness itself is dependent on mental processes that occur out of view. We couldn't *be* conscious without a nonconscious mind, just as what we see on the screen of a computer could not exist without a sophisticated system of hardware and software operating inside the box. Nonetheless, it is worth illustrating the importance of nonconscious thinking by pursuing our thought experiment a little further, exploring in more detail what it would be like to be Mr. D. Let's grant him the use of his perceptual system and see what else would be affected.

Suppose Mr. D. turned on the television and heard a newscaster say, "Jones threw his hat into the ring last night, a year before the first presidential primary." When you read this sentence, you did not have to pause after each word and look it up in your mental dictionary; the meanings came to mind immediately. Mr. D., though, does not have this lightning-fast ability to "look up" words; he would have to search laboriously for the meaning of each word as he encountered it. It is not even clear that he could access his mental dictionary without the aid of nonconscious processes, but for the sake of the example let's suppose he could.

When you read the words "threw his hat into the ring," you undoubtedly interpreted them to mean that Jones announced that he was running for president, without consciously considering alternative meanings. You probably did not entertain the possibility that Jones was at the circus and decided that one of the dancing elephants would look nice in his fedora.

Of course not, you might think, because it's obvious what the newscaster meant. But why is this obvious? The part about the presidential primaries came after the part about throwing the hat. There was no way you could have known what the newscaster meant when you first read about hat-throwing; you must have read the entire sentence and then

gone back and attached the most likely meaning to the words. All this was done quite rapidly and nonconsciously, with no awareness that you were interpreting what was, in truth, an ambiguous sentence. Alas, poor Mr. D. would have to pause and consider the different meanings of the words and how they might apply in the context in which they were used. By the time he figured it out, the newscaster would be well into the next story about a massive heat wave approaching New England—prompting Mr. D. to wonder whether a tsunami was about to strike Massachusetts.

In short, the mental processes that operate our perceptual, language, and motor systems operate largely outside of awareness, much like the vast workings of the federal government that go on out of view of the president. If all the lower-level members of the executive branch were to take the day off, very little governmental work would get done. Similarly, if a person's perceptual, language, and motor systems stopped working, people would find it difficult to function.

But what about the higher-order functions that make us uniquely human—our ability to think, reason, ponder, create, feel, and decide? A reasonable portrait of the human mind is that lower-order functions (e.g., perception, language comprehension) operate out of view, whereas higher-order functions (e.g., reasoning, thinking) are conscious. Pursuing our executive-branch analogy, the lower-level employees (the nonconscious mind) gather information and follow orders, but it is the high-level employees, such as the president and the cabinet officers, who ponder information, make decisions, and set policy. And these "mind executives" are always conscious.

This portrayal of the mind vastly underestimates the role of nonconscious processing in humans. To illustrate this point, let's make a final concession and give Mr. D. the use of all his "lower-order" perceptual, motor, and language abilities (a quite generous bequest, given the complexities of language and the vast capacity of humans to communicate quickly and efficiently with the written and spoken word). Would the absence of any further nonconscious processes impair him in any way? Or would he now have a fully equipped human mind?

Mr. D. would be at a severe disadvantage in all aspects of his life. Some very important tasks that we usually ascribe to consciousness can be performed nonconsciously, such as deciding what information to pay attention to, interpreting and evaluating that information, learning new things, and setting goals for ourselves. When we see a truck careening toward us as we are crossing a street, we know instantly that we are in danger and quickly jump out of the way, without having to deliberate consciously about the truck. Mr. D. would not experience that sudden fear in the pit of his stomach, at least not until he had time to retrieve laboriously from memory what he knew about trucks and their effects on unwary pedestrians. Similarly, when meeting someone for the first time we quickly make assumptions about the kind of person she is and experience a positive or negative evaluation—all within seconds or less.

Further, much of what we think of as Mr. D.'s personality—his temperament, his characteristic way of responding to people, his distinctive nature that makes him *him*—would no longer exist. An important part of personality is the ability to respond in quick, habitual ways to the social world. It also means having a healthy psychological defense system, warding off threats to the self in reasonable, adaptive ways. Much of this personality system operates outside of awareness.

Defining the Unconscious

A simple definition of the unconscious is anything that is in your mind that you are not consciously aware of at a particular point in time. However, we quickly run into problems here. Suppose I asked you for the name of your hometown. Presumably you did not have any trouble bringing the name of this city into consciousness, even though this city was probably not in your consciousness before I asked you to think about it. Does this mean that the name of your hometown is unconscious most of the time?

This argument would seem to be stretching things and highlights the problem of equating consciousness with attention or short-term mem-

ory, as some theorists prefer to do.[3] I, for one, would not want to say that I am unconscious of "Philadelphia" when I am not thinking about it. Philadelphia may not be in my working memory or the object of my current attention, but it is not unconscious, at least in my conception of the term. It is one of the thousands of things I can retrieve from long-term memory when needed—Philadelphia, W. C. Fields's joke about it, the starting lineup of the 1966–67 Philadelphia 76ers, the words and music to "South Street" by the Orlons. Freud described thoughts such as these as residing in the "preconscious," the mental anteroom in which thoughts remain until they "succeed in attracting the eye of consciousness."[4]

What is more interesting is the part of my mind that I cannot access even when I try. A better working definition of the unconscious is *mental processes that are inaccessible to consciousness but that influence judgments, feelings, or behavior.* No matter how long I tried, I could not access my proprioception system or the way in which my mind transforms light rays that strike my retina into three-dimensional vision. Nor do I have direct access to many of my higher-order mental processes, such as the way I select, interpret, and evaluate incoming information and set goals in motion.

The unconscious is notoriously difficult to define, and my definition is but one of many that have been offered. I don't like getting bogged down in definitional issues and will not dwell on the many alternatives.[5] It is more interesting to take a look at what humans can accomplish outside the spotlight of consciousness.

The Adaptive Unconscious, or What Mr. D. Cannot Do

The term "adaptive unconscious" is meant to convey that nonconscious thinking is an evolutionary adaptation. The ability to size up our environments, disambiguate them, interpret them, and initiate behavior quickly and nonconsciously confers a survival advantage and thus was selected for. Without these nonconscious processes, we would have a very difficult time navigating through the world (much less standing up

without constant attention, like Ian Waterman). This is not to say that nonconscious thinking always leads to accurate judgments, but on balance it is vital to our survival.[6]

Consider that at any given moment, our five senses are taking in more than 11,000,000 pieces of information. Scientists have determined this number by counting the receptor cells each sense organ has and the nerves that go from these cells to the brain. Our eyes alone receive and send over 10,000,000 signals to our brains each second. Scientists have also tried to determine how many of these signals can be processed consciously at any given point in time, by looking at such things as how quickly people can read, consciously detect different flashes of light, and tell apart different kinds of smells. The most liberal estimate is that people can process consciously about 40 pieces of information per second. Think about it: we take in 11,000,000 pieces of information a second, but can process only 40 of them consciously. What happens to the other 10,999,960? It would be terribly wasteful to design a system with such incredible sensory acuity but very little capacity to use the incoming information. Fortunately, we do make use of a great deal of this information outside of conscious awareness.[7]

LEARNING: THE ADAPTIVE UNCONSCIOUS AS PATTERN DETECTOR

Suppose you were introduced to a person who suffered from amnesia due to brain damage. Organic amnesia can result from a number of traumas to the brain, such as injuries suffered in car accidents, brain surgery, Alzheimer's disease, and Korsakoff's syndrome (brain damage resulting from chronic alcohol abuse). These disorders lead to somewhat different kinds of memory deficits, depending on the exact areas of the brain that are affected. In all of them, however, people lose the ability to form memories of new experiences.

If you were to encounter such a person, you probably could not tell right away that he or she suffered from amnesia. People with these disorders usually retain their level of intelligence and their general personalities. Suppose, however, that you were to chat with an amnesiac for awhile, leave the room, and return an hour later. You would find that the

person had no memory of having met you before. Everyone, of course, has occasional memory lapses, such as failing to remember the name of someone he or she has just met. What is striking about amnesiacs is that they have no conscious recollection of any new experience.

Note my key use of the word "conscious" in the previous sentence. It is now clear that amnesiacs can learn many things nonconsciously. A famous (and devilish) demonstration of this fact was performed by a French physician named Edouard Claparède. Each time he visited a woman suffering from amnesia, she had no recollection of ever having met him before. He would have to introduce himself anew at each visit. One day, Claparède reached out and shook her hand, as usual, but this time he concealed a pin in his hand. The woman withdrew her hand quickly, surprised at the painful prick. The next time Claparède visited the woman, she showed no sign of recognizing him, and so he reintroduced himself and held out his hand. This time, however, she refused to shake his hand. She had no conscious recollection of ever having met Claparède but somehow "knew" that she shook this man's hand at her own risk. Claparède observed several other examples of such nonconscious learning in this patient; for example, she had no conscious memory of the layout of the institution in which she had lived for six years. When asked how to get to the bathroom or the dining hall, she could not say. However, when she wanted to go to one of these locations, she would walk directly to it without getting lost.[8]

There are by now many other examples of people's ability to learn new information nonconsciously. People are even able to understand and retain some of what occurs when they are under general anesthesia. When patients are given suggestions during surgery that they will recover quickly, they subsequently spend less time in the hospital than patients not given the suggestions, despite having no conscious memory of what was said while they were under anesthesia.[9]

Cases such as these illustrate the difference between two types of learning, implicit and explicit. Explicit learning is the effortful, conscious kind of memorization we often dread. When we think about the prospect of learning something difficult—a foreign language, how to

assemble our new gas grill—we often groan and anticipate a lot of painful work. To accomplish such tasks we need to engage in prolonged concentration, devoting all of our conscious attention to learning vocabulary lists or figuring out how to attach the hose in Figure A11 to the burner in Figure C6.

It should thus come as good news that we are capable of learning a great deal of complex information implicitly without any effort at all, such as Claparède's patient's knowledge of how to get to the dining hall. Implicit learning is defined as learning without effort or awareness of exactly what has been learned. Perhaps the best example is a child's ability to master her native language. Children do not spend hours studying vocabulary lists and attending classes on grammar and syntax. They would be hard pressed to explain what participles are, despite their ability to use them fluently. Humans learn to speak with no effort or intention; it just happens.

Implicit learning is one of the most important functions of the adaptive unconscious. Again, let us not oversimplify. The precise nature of implicit learning and its relationship to explicit processing is the topic of much debate and research.[10] Nonetheless, it is clear that the adaptive unconscious is capable of learning complex information, and indeed, under some circumstances it learns information better and faster than our conscious minds.

A striking demonstration of implicit learning is a study by Pawel Lewicki, Thomas Hill, and Elizabeth Bizot. The participant's task was to watch a computer screen that was divided into four quadrants. On each trial, the letter *X* appeared in a quadrant, and the participant pressed one of four buttons to indicate which one. Unbeknownst to the participant, the presentations of the *X*'s were divided into blocks of twelve that followed a complex rule. For example, the *X* never appeared in the same square two times in a row; the third location depended on the location of the second; the fourth location depended on the location of the preceding two trials; and an *X* never "returned" to its original location until it had appeared in at least two of the other squares. Although the exact rules were complicated, participants appeared to learn them. As time

went by their performance steadily improved, and they became faster and faster at pressing the correct button when the *X* appeared on the screen. None of the participants, however, could verbalize what the rules were or even that they had learned anything.

That they learned the complex rules nonconsciously was shown by what happened next in the experiment. The researchers suddenly changed the rules so that the clues predicting where the *X* would appear were no longer valid, and the participants' performance deteriorated. They took a very long time to identify the location of the *X* and made several mistakes. Although participants noticed that they could no longer do the task very well, none of them knew why. They had no awareness that they had learned rules that no longer applied. Instead, they consciously searched for other explanations for their sudden poor performance.

Incidentally, the participants were psychology professors who knew that the study concerned nonconscious learning. Despite this knowledge, they had no idea what they had learned or why their performance suddenly deteriorated. Three of the professors said that their fingers had "suddenly lost the rhythm," and two were convinced that the experimenters had flashed distracting subliminal pictures on the screen.[11]

The kinds of rules people learned in this experiment are notoriously difficult to learn consciously. The Lewicki, Hill, and Bizot study may be a case in which the adaptive unconscious does better than our conscious minds. To return to our example of Mr. D., it is becoming clear that without a nonconscious mind, he would not be able to learn complex patterns in his environment quickly and efficiently.

ATTENTION AND SELECTION: THE NONCONSCIOUS FILTER

As noted, our senses are detecting about 11,000,000 pieces of information per second. As you read this book you can probably hear many sounds, such as the ticking of a clock or gusts of wind outside your window. You can see not only the words on this page, but also the page number and the surface against which the book is resting, such as a desk or piece of clothing. You can feel the weight of the book on your hands and

the pressure of your foot against the floor. Let's not forget smell and taste, such as the aroma from a cup of coffee or the faint aftertaste of the tuna sandwich you had for lunch.

All of this assumes that you are sitting in a quiet spot by yourself as you read. Should you happen to be on a subway or in a public park, the amount of information reaching your senses is of course much larger. How, then, can you possibly read and comprehend the words on this page, with all this competing information striking your senses? How do we make sense of the "blooming, buzzing, confusion" that reaches our senses, in William James's oft-quoted words?

We are able to do so because of a wonderful thing called selective attention. We are equipped with a nonconscious filter that examines the information reaching our senses and decides what to admit to consciousness.[12] We can consciously control the "settings" of the filter to some degree, by deciding, for example, to stop listening to the song on the radio and scan the side of the highway for our favorite fast-food joint. The operation of the filter, however—the way in which information is classified, sorted, and selected for further processing—occurs outside of awareness. And that's a very good thing, because it allows us to concentrate on the task at hand, such as finding a place for lunch instead of singing along with Smokey Robinson on the radio.[13]

The nonconscious filter does more than allow us to focus our conscious attention on one thing at a time. It also monitors what we are *not* paying attention to, in case something important happens that we should know about. At a crowded cocktail party, for example, we can block out the many conversations going on around us except for the one we happen to be in. This alone is no small feat and is a tribute to our capacity for selective attention. But what happens when Sidney, standing ten feet away, mentions your name to his companion? Suddenly your attention shifts; you hear your name, and your ears begin to burn. As commonplace as this example is, think of the amazing implications it has for how the mind operates. The nonconscious mind is kind of like computer programs that scan the Internet, out of sight, and send us an e-mail message when it comes across information that is of interest to

us. Part of our minds can scan what is *not* the focus of our attention and alert us when something interesting happens. When the nonconscious filter hears Sidney droning on about his gall bladder operation, it decides to ignore it. But when it hears him mention our name—presto, it sends it directly to our conscious attention. Without such an ability to monitor and filter information nonconsciously, our worlds, like Mr. D.'s, would be a "blooming, buzzing, confusion."[14]

INTERPRETATION: THE NONCONSCIOUS TRANSLATOR

A few years ago I met a man named Phil at a parent-teachers' organization meeting at my daughter's school. As soon as I met him, I remembered something that my wife had told me about Phil: "He's a real pain at meetings," she had said. "He interrupts a lot, doesn't listen to people, and is always pushing his personal agenda." I quickly saw what she meant. When the principal was explaining a new reading program, Phil interrupted and asked how his son would benefit from it. Later in the meeting, Phil argued with another parent about how the PTO should conduct a fundraiser and seemed unwilling to consider her point of view.

When I got home that night I said to my wife, "You sure were right about Phil. He's rude and arrogant." My wife looked at me quizzically. "Phil isn't the one I was telling you about," she said. "That was Bill. Phil is actually a very nice guy who regularly volunteers in the schools." Sheepishly, I thought back to the meeting and realized that Phil had probably not interrupted or argued with people any more than others had (including me). Further, I realized that even Phil's interruption of the principal was not so clear-cut. What I saw as rude and belligerent may actually have been a zealous attempt by a caring parent to make his viewpoint known—something I have certainly been guilty of. My interpretation was just that—a nonconscious construal of a behavior that was open to many interpretations.

It is well known that first impressions are powerful, even when they are based on faulty information. What may not be so obvious is the extent to which the adaptive unconscious is doing the interpreting. When I saw Phil interrupt the principal I felt as though I was observing

an objectively rude act. I had no idea that Phil's behavior was being interpreted by my adaptive unconscious and then presented to me as reality. Thus, even though I was aware of my expectations (that Phil would be overbearing), I had no idea how much this expectation colored my interpretation of his behavior.

One of the clearest demonstrations of such nonconscious interpretation is an experiment by John Bargh and Paula Pietromonaco, in which people did not even know that they had an expectation about a person. The researchers activated a personality trait by flashing words to people at subliminal levels, and found that people used this trait when subsequently interpreting another person's behavior. As part of a study on perception, participants judged whether flashes on a computer monitor occurred on the left or right side of the screen. Unbeknownst to them, the flashes were words shown for very brief durations (1/10 of a second) and followed immediately by a line of *X*'s. Because the words were flashed so quickly and were "masked" by the *X*'s, people were unaware that words had been presented.

In one condition, 80 percent of the flashed words had to do with hostility, such as "hostile," "insult," and "unkind." In a second condition, none of the words had to do with hostility. Next, people took part in what they thought was an unrelated experiment on how people form impressions of others. They read a paragraph describing a man named Donald, who acted in somewhat ambiguous ways that might be construed as hostile, such as "A salesman knocked at the door, but Donald refused to let him enter."

Those who had seen flashes of hostile words judged Donald to be more hostile and unfriendly than did people who had not seen flashes of hostile words—just as I judged Phil's behavior to be rude and belligerent, because my wife's impression of him was on my mind. We can be certain that this process occurred nonconsciously in the Bargh and Pietromonaco study, because people had no idea that they had seen hostile words earlier in the study. They believed that Donald was an objectively hostile man, with no realization that they had interpreted his ambiguous behavior as hostile because of the words they had seen ear-

lier. (This experiment raises the specter of subliminal influence, such as whether people's attitudes and behaviors can be influenced by flashes of words in advertisements. We will take up this question in Chapter 9.)

The adaptive unconscious is thus more than just a gatekeeper, deciding what information to admit to consciousness. It is also a spin doctor that interprets information outside of awareness. One of the most important judgments we make is about the motives, intentions, and dispositions of other people, and it is to our advantage to make these judgments quickly. The Phil example shows that sometimes these interpretations are based on faulty data (the Bill-Phil mix up) and are thus incorrect. Quite often, however, the adaptive unconscious does a reasonably accurate job of interpreting other people's behavior.[15]

FEELING AND EMOTION: THE ADAPTIVE UNCONSCIOUS AS EVALUATOR

So far, the adaptive unconscious may seem like a rather cold, emotionless interpreter of the world that keeps track of the information impinging on our senses, selects some of this information for further processing, and does the best it can at interpreting the meaning of this information. This portrayal is accurate as far as it goes, except that it makes the adaptive unconscious look like a Vulcan, the *Star Trek* species that is devoid of human emotions. Actually, nothing could be further from the truth. Not only does the adaptive unconscious select and interpret; it feels.

In many hackneyed works of science fiction, human emotions are treated as excess baggage that get in the way of efficient decisionmaking. Invariably there is an android that is a much better thinker and decisionmaker than its human counterparts, because it has no emotions to muck up things. By the end of the story, we come to realize that we would never trade our lives for the android's. Even though emotions cause us to act irrationally and to make bad decisions, we are willing to sacrifice precision and accuracy for the richness of love, passion, and art. Who would want to live the stark, emotionless life of an android?

The irony of these stories is that they underestimate how valuable feelings are to thinking and decisionmaking. It is now clear that feelings are

functional, not excess baggage that impedes decisionmaking. Yes, there are times when emotions blind us to logic and lead to terrible decisions. In a fit of passion, people do sometimes abandon their families and run off with the drug-addled leader of a motorcycle gang. More commonly, though, our feelings are extremely useful indicators that help us to make wise decisions. And a case could be made that the most important function of the adaptive unconscious is to generate these feelings.

Consider an experiment by Antoine Bechara, Hanna Damasio, Daniel Tranel, and Antonio Damasio. Participants played a gambling game in which they selected cards from one of four decks. The cards in decks A and B resulted in large gains or losses of play money, adding up to a net loss if played consistently. The cards in decks C and D resulted in small gains or losses of money, adding up to a net gain if played consistently. The question was, how long did it take people to figure out that it was to their advantage to select cards from decks C and D? And how did they do so? To find out, the researchers measured three things: which cards people chose, their reports about why they chose the card they did, and their level of skin conductance while making their choices. (Skin conductance, measured with electrodes on the skin, is a measure of minute levels of sweating and is a good indicator of people's momentary levels of arousal or emotion.)

After sampling cards from all four decks, normal participants learned to select cards from decks C and D and avoid cards from decks A and B—without being able to verbalize what they were doing. That is, they did not seem to recognize consciously that two of the decks were superior to the others. How, then, did they know to avoid decks A and B? After several trials, participants showed a marked increase in their skin conductance while pondering whether to choose a card from deck A or B, signaling them that something was wrong with this choice. Their adaptive unconscious had learned that decks A and B were risky and triggered a quick "gut feeling," before their conscious minds knew what was going on.

The researchers also included participants who had damage to the ventromedial prefrontal region of their brains. This part of the brain,

which is a small area located behind the bridge of the nose, is associated with the production of gut feelings. The people with damage to this area never showed an increase in skin conductance when thinking about decks A and B. They continued to make poor choices (and lose money). Antonio Damasio and his colleagues argue that damage to the prefrontal cortex prevents the nonconscious mind from learning from experience and signaling people how to respond. Tragically, the loss of this ability has far more important consequences than failing to learn the payoffs in a laboratory gambling task. Damasio documents several cases in which people's lives have become quite dysfunctional after damage to this area of their brains, because their nonconscious minds have lost the ability to generate gut feelings that guide their judgments and decisions.[16]

NONCONSCIOUS GOAL-SETTING

Suppose you are playing tennis with your ten-year-old nephew. You need to decide whether to try as hard as possible to win the match (and thereby satisfy your desire to be athletic and competitive) or to let your nephew win (and thereby satisfy your desire to be gracious, kind, and avuncular). How do you choose between these competing goals? One way is to make a conscious, deliberative choice: you think it over and decide that in this situation, being gracious is more important than playing like Andre Agassi.

Sometimes this is exactly what we do. One of the most important features of consciousness is goal-setting; we are probably the only species on Earth that can deliberate consciously about ourselves and our environments and make long-term plans for the future. But is consciousness the sole agent in goal-setting?

John Bargh and Peter Gollwitzer and their colleagues argue that events in the environment can trigger goals and direct our behavior completely outside of conscious awareness. Just as other kinds of thinking can become habitual, automatic, and nonconscious, so can the selection of goals. Perhaps you have played so much tennis in the past that you can choose your goal on automatic pilot. You decide to let your nephew win without ever thinking about it consciously. As with other

kinds of thought, there are tremendous advantages to such automatic goal-selection in terms of efficiency and speed. You do not need to spend time before every tennis match deliberating about how hard to try; your automatic goal selector does the job for you (e.g., "If playing younger relative, don't ace every serve; if playing obnoxious Oglethorpe from down the street, play as though it's the finals at Wimbledon").

But efficiency and speed come with a cost. The adaptive unconscious can choose a different goal from the one we would if we thought it through consciously. You might find yourself making great passing shots and lobs against your frustrated nephew because your competitive goals had been triggered without your realizing it. Even more ominously, people's adaptive unconscious might acquire goals of which they are completely unaware and would not act on deliberately, such as the desire for sex as a means of satisfying the need for power.

Bargh and his colleagues have shown, for example, that some men have a nonconscious association between power and attraction to women. They conducted a study in which they primed the concept of power in male college students, to see if this influenced how attractive they found a female college student to be. The male participants had no idea that the study concerned power or sexual attraction. They thought they were participating in a study of visual illusions with a female partner, who was actually an assistant of the experimenter. As part of this study they filled in the blanks of sixteen word fragments to make complete words. Six of these fragments could be completed only with words that had to do with power, such as BO_S (boss), _ _ NTROL (control), AUT_ _ R _ T _ (authority). This was the priming task; completing the word fragments made the concept of power more accessible in people's thoughts. Following the word-completion task, the participants rated the attractiveness of their female partner. For some men—namely, those who had scored highly on a measure of sexual aggression—priming the concept of power increased how attractive they found the woman to be (for other men, there was no relation between priming "power" and their attraction to the woman). Further, these men had no idea that there

was such a link between the word fragments they had completed and how attractive they found the woman to be.

Men are often said to just "not get it" when it comes to understanding sexual harassment. Generalizing from the research by Bargh and colleagues, this might literally be true: men likely to engage in sexual aggression are unaware that they have a nonconscious association between sex and power, and unaware that this association is triggered automatically. This lack of awareness makes it more difficult to prevent sexual aggression. Men in a position of authority may believe that their behavior toward female subordinates is motivated by good intentions, because they are unaware that their feelings were triggered by their position of power.[17]

What's the Agenda?

The adaptive unconscious thus plays a major executive role in our mental lives. It gathers information, interprets and evaluates it, and sets goals in motion, quickly and efficiently. This is a wonderful set of mental abilities to have, and if we were to lose them, like Mr. D., we would find it very difficult to make it through the day. But how does the adaptive unconscious decide *what* to select, *how* to interpret and evaluate, and *which* goal to set in motion? In short, what is its agenda?

Clearly, in order to be adaptive, nonconscious processes have to be concerned with making accurate assessments of the world. As Charlotte Brontë wrote in *Jane Eyre,* "The passions may rage furiously, like true heathens . . . and the desires may imagine all sorts of vain things: but judgment shall still have the last word in every argument, and the casting vote in every decision."[18] All organisms have to represent their worlds accurately enough to find food, avoid danger, and produce offspring, or they will perish. An early primate who appraised tigers as "fun to pet" and edible plants as "scary, icky things" would not have survived for very long. Those who can spot dangers and opportunities fastest are at a huge advantage. In the Bechara card game study, for example, people seemed

able to figure out which decks had the best payoffs quickly and nonconsciously, without being able to verbalize why they preferred decks C and D. Think of the advantage such an ability gives us in everyday life. Our conscious mind is often too slow to figure out what the best course of action is, so our nonconscious mind does the job for us and sends us signals (e.g., gut feelings) that tell us what to do.

Though it is a wonderful thing that our nonconscious minds are so quick to make accurate judgments of the social world, people cannot live by accuracy alone. There is a lot of information out there to analyze, and it is clearly to our advantage to prioritize it, recognizing what we should focus on and what we can safely ignore.

Consider a college basketball player who is dribbling the ball up the court in the closing seconds of an important game. There is a lot to analyze—possible openings in the opposing team's defense, the sight of her teammate setting a pick on the right baseline, the knowledge that her center has always played well against the opposing player who is guarding her. It is by no means easy for people to process such complex information quickly and decide on a good course of action. We tend to take for granted, however, that at least people can narrow their attention to the most important task at hand. Think of all the other things that the basketball player could focus on, if she so chose: what the fans in the first row are shouting, the new routine being performed by the cheerleaders, the fact that she is thirsty and would like a drink of water, the knowledge that she has a history paper due the next day. Instead of thinking about these things, her attention is like a spotlight at the theater, able to focus narrowly on what is happening on center stage and keeping everything else in the dark.

People with damage to the prefrontal cortex find it difficult to know where to point the spotlight of attention. A college basketball player with damage to this area of the brain might be very skilled athletically but would be quite frustrating to watch. In the last seconds of a close game, she might decide to put the ball down and tie her shoes more tightly, or chat with the fans in Row 3. Damasio relates the case of a businessman whose prefrontal cortex was damaged during surgery for a brain tumor.

This man retained much of his intelligence, such as his ability to read and analyze complex business reports. But he couldn't judge the relative importance of different tasks. He might spend all day at the office organizing his desk drawers, believing that this should take priority over finishing a report that was due that day.[19]

How do normal people focus on relevant information and screen out everything else? The cocktail-party example I gave earlier, in which we were able to ignore Sidney's account of his operation but pay close attention when he mentioned our name, suggests that the more relevant to us a piece of information is, the more likely it will be on the nonconscious filter's "A" list of information to notice. Damasio's businessman seemed unable to judge the self-relevance of the different tasks with which he was faced—he did not recognize that it was more to his advantage to finish the report than to put his paper clips in their proper place.

It turns out, though, that self-relevance isn't quite the right way to describe how the adaptive unconscious decides what is important and what is not. Rather, the decision rule is how accessible a particular idea or category is. "Accessibility" is a somewhat technical psychological term that refers to the activation potential of information in memory. When information is high in activation potential it is "energized" and ready to be used; when it is low in activation potential it is unlikely to be used to select and interpret information in one's environment. Accessibility is determined not only by the self-relevance of a category but also by how recently it has been encountered. In the Bargh and Pietromonaco study mentioned earlier, for example, the concept of hostility was accessible in people's minds because of the words that had been flashed a few minutes earlier, not necessarily because this concept was self-relevant.

Another determinant of accessibility is how often a concept has been used in the past. People are creatures of habit, and the more they have used a particular way of judging the world in the past, the more energized that concept will be. Our nonconscious minds develop chronic ways of interpreting information from our environments; in psychological parlance, certain ideas and categories become chronically accessible as a result of frequent use in the past. The college basketball player has

been in hundreds of games similar to the current one and has learned what information to attend to and what to ignore. She notices that the forward is late getting around the pick and that the center just cut toward the basket, a half-step ahead of the defender—without having to decide whether this information is more or less important than what the cheerleaders are doing.

The adaptive unconscious is not governed by accuracy and accessibility alone. People's judgments and interpretations are often guided by a quite different concern, namely the desire to view the world in the way that gives them the most pleasure—what can be called the "feel-good" criterion. Jane Eyre observed this motive in her aunt, Mrs. Reed, when she visited her on her deathbed: "I knew by her stony eye—opaque to tenderness, indissoluble to tears—that she was resolved to consider me bad to the last; because to believe me good would give her no generous pleasure: only a sense of mortification."[20]

One of the most enduring lessons from social psychology is that like Mrs. Reed, people go to great lengths to view the world in a way that maintains a sense of well-being. We are masterly spin doctors, rationalizers, and justifiers of threatening information. Daniel Gilbert and I have called this ability the "psychological immune system." Just as we possess a potent physical immune system that protects us from threats to our physical well-being, so do we possess a potent psychological immune system that protects us from threats to our psychological well-being. When it comes to maintaining a sense of well-being, each of us is the ultimate spin doctor.[21]

People who grow up in Western cultures and who have an independent view of the self tend to promote their sense of well-being by exaggerating their superiority over others. People who grow up in East Asian cultures and have a more interdependent sense of self are more likely to exaggerate their commonalities with group members. That is, people who grow up in cultures with an interdependent view of the self may be less likely to engage in tactics that promote a positive self-view, because they have less investment in the self as an entity separate from their social group. Nonetheless, nonconscious spin doctoring occurs in order

to maintain a sense of well-being, though the form of the doctoring differs. *What* makes us feel good depends on our culture and our personalities and our level of self-esteem, but the *desire* to feel good, and the ability to meet this desire with nonconscious thought, are probably universal.[22]

To what extent is the psychological immune system part of the adaptive unconscious? Sometimes we act on the "feel-good" motive quite consciously and deliberately, such as avoiding an acquaintance who is always criticizing us, or trying to convince ourselves that we failed to get a promotion not because we were unqualified, but because the boss was an insensitive ox. Given that the adaptive unconscious plays a major role in selecting, interpreting, and evaluating incoming information, though, it is no surprise that one of the rules it follows is "Select, interpret, and evaluate information in ways that make me feel good." Furthermore, there is reason to believe that the adaptive unconscious is a better spin doctor than the conscious mind. As Freud noted, psychological defenses often work best when they operate in the back alleys of our minds, keeping us blind to the fact that any distortion is going on. If people knew that they were changing their beliefs just to make themselves feel better, the change would not be as compelling.

A key question concerns how the accuracy and "feel-good" criteria operate together, because they are often incompatible. Consider Jack, who failed to get an anticipated promotion. If accuracy were his only criterion, Jack might well conclude that he did not have the experience or ability to handle the new position. Instead, he uses the "feel-good" rule and concludes that his boss is an idiot. But is it really in his best interests to pat himself on the back and blame his boss? If he does not have the experience or ability to do the job, wouldn't he be better off to swallow his pride and work harder?

The conflict between the need to be accurate and the desire to feel good about ourselves is one of the major battlegrounds of the self, and how this battle is waged and how it is won are central determinants of who we are and how we feel about ourselves. The best way to "win" this battle, in terms of being a healthy, well-adjusted person, is not always

obvious. We must, of course, keep in touch with reality and know our own abilities well enough to engage in self-improvement. But it turns out that a dose of self-deception can be helpful as well, enabling us to maintain a positive view of ourselves and an optimistic view of the future.[23]

Mr. D. Revisited

It should now be clear that Mr. D.'s loss of nonconscious processing would be incapacitating. Not only would he lose his lower-order mental capacities, such as his perceptual abilities, but his higher-order cognitive processing would also be severely impaired. The adaptive unconscious is actively involved in learning, selection, interpretation, evaluation, and goal-setting, and the loss of these abilities would be devastating.

But the fact that nonconscious processes are adaptive does not mean that they always produce error-free judgments. One reason for this is that it is not always to people's advantage to see the world accurately; a dose of congratulatory self-deception can be useful as well.

Further, just because a trait or process has evolved due to natural selection does not mean it is a perfect system that cannot be improved. The human visual system confers a survival advantage; in our evolutionary past, people who could see extremely well were more likely to survive than those who could not. Human vision is not perfect, however; surely we would be even better off if we had the night vision of an owl, or 20/5 vision instead of 20/20. Likewise, though generally beneficial, nonconscious mental processes are not perfect.

Second, many advantageous traits come with a trade-off: though generally beneficial, they have by-products that are not. The human visual system suffers from predictable optical illusions, not because these illusions are themselves adaptive, but because they are by-products of a system that is. Similarly, the advantages conferred by many types of nonconscious mental processes (e.g., the ability to categorize objects and people quickly, correctly "filling in the blanks" when we encounter ambiguous information) can have negative consequences (e.g., the ten-

dency to overcategorize people, leading to stereotyping and prejudice). Further, because much of our mental life resides outside of consciousness, we often do not know how we are sizing up the world or even the nature of our own personalities. We will see many examples of the cost in self-insight we pay for having such an efficient and sophisticated adaptive unconscious.

First, however, we should consider how the nonconscious and conscious minds differ. Many of the nonconscious processes we considered, such as evaluation and goal-setting, can be performed by our conscious minds as well. If the nonconscious mind is so sophisticated and extensive, what is the function of consciousness? Do the conscious and nonconscious systems differ in fundamental ways, or do they perform the same tasks?

Who's in Charge?

> The more of the details of our daily life we can hand over to the effortless custody of automatism, the more our higher power of mind will be set free for their own proper work.
>
> —*William James, Principles of Psychology (1890)*

Few would disagree with William James's observation about the division of mental labor. People would never get anything done if they had to attend constantly to their breathing, comprehension of language, and perceptions of the physical world. A key question, though, is what we are able to "hand over" to the nonconscious mind. James seems to imply that we delegate the mundane tasks of living, much as chief executive officers rely on their staffs to attend to the details while they address the truly important questions. It is better for a CEO to plan the long-term fate of the company than to sweep the office floors.

But our nonconscious minds are not just the janitorial staff or even low-level managers. As we have seen, what is typically thought of as the "proper work" of consciousness—goal-setting, interpretation, evaluation—can be performed nonconsciously. Once we acknowledge that people can think in quite sophisticated ways nonconsciously, however, questions arise about the relation between conscious and nonconscious processing. Exactly what is the division

of labor between these two parts of the mind? Is consciousness really the CEO? Who's in charge, anyway?

Perhaps the nonconscious and conscious systems operate in the same way according to the same rules. By this view, humans are blessed with two redundant systems, like modern jet liners that have backup systems in case one fails. Maybe we have two information-processing systems for the same reason that we have two kidneys and two lungs. Effective thinking is so critical to our well-being, this argument goes, that we have developed two redundant minds that are capable of performing exactly the same duties. If one stumbles, the other is there to take up the slack.

But surely this can't be right. Although Freud underestimated the sophistication and adultlike nature of the unconscious, he was correct that it has a different character from the conscious self. Two information-processing systems have evolved that differ in interesting ways and serve different functions.

Consciousness, Evolution, and Function

Few would disagree with the premise that selection pressures operate on the mind/brain as well as the body. The fact that humans have brains so similar to other primates' is surely not a coincidence but a result of similarities in our evolutionary past. And the fact that the frontal cortex is proportionately largest in humans, second largest in the great apes, and smallest in prosimians such as lemurs and tarsiers, is surely due to the forces of natural selection.[1]

What are we to make of this fact when we try to understand the nature of the mind, such as the roles of conscious and nonconscious thinking? It is reasonable to assume that the adaptive unconscious is older, in evolutionary terms, than consciousness. That is, consciousness may be a more recent acquisition than nonconscious processing, and hence has different functions. Nonconscious processing shares the features of all biological systems that evolved early in the organism's history. For example, older systems are less easily disrupted or damaged than newer

systems, they emerge earlier in the individual organism, and they are shared by more species than newer adaptations. Each of these properties is true of nonconscious processing.[2]

If people could think efficiently without being conscious, why did consciousness evolve? It is tempting to conclude that it conferred a marked survival advantage, to explain why it has become a universal feature of the human mind. Although on the face of it this might seem obvious, it is actually an unsettled question that is the topic of much debate.

Now that it is accepted that Descartes was wrong on two fronts—the mind is not separate from the body, and consciousness and the mind are not the same thing—there has been an explosion of interest in the nature of consciousness, both in the popular press and in scholarly circles. *Discover* magazine recently dubbed this question as one of the most important mysteries yet to be solved. Dozens of books, journals, and professional conferences are devoted solely to the topic. A few years ago the philosopher Daniel Dennett declined an invitation to review recent books on consciousness, for the simple reason that there were too many (thirty-four, by his count).

Philosophers are wrangling, with renewed energy, over age-old questions: How can the subjective state of consciousness arise from a physical brain? What is the nature of conscious experience? Can we ever hope to understand what it is like to be another species or even another human? Are humans the only species that possess consciousness? Does consciousness have a function, and if so, what is it?

These questions are of two types: how consciousness *seems* versus what consciousness *does*.[3] We are making more progress on the second question than on the first, at least in a scientific sense. It is telling that there are as many theories about the nature of consciousness (how it "seems") as there are philosophers studying it, and it is not at all clear how to address this question scientifically.

The function of consciousness is a more tractable question and is the one with which I will be most concerned. Before considering how best to

obtain self-knowledge, we need to make at least some headway on such questions as whether it makes any difference to know ourselves. Does gaining insight (becoming conscious of previously unknown things about ourselves) change anything? Does the person who has limited insight into the reasons for her actions, for example, behave any differently from the person who has great insight?

A standard analogy is that consciousness is the president in the executive branch of the mind. In this conception, there is a vast network of agencies, aides, cabinet officers, and support staff who work out of view of the president. This is the adaptive unconscious, and a smooth-running government could not exist without it. There is simply too much for one person to try to do, and a president could not function without his or her many (nonconscious) agencies operating out of view. The president is in charge of this vast network, setting policy, making the major decisions, and intervening when serious problems arise. Clearly, consciousness plays a crucial function in these activities. The adaptive unconscious is subservient to consciousness (the president) and reports to it. At the same time, the president who becomes too out of touch is in trouble. If he or she is ignorant of what is occurring out of sight (lacking in self-insight), then the agencies of the adaptive unconscious may start to make decisions that are contrary to the wishes of the president.

Others have questioned the consciousness-as-chief-executive analogy, arguing that consciousness may not play such a crucial role. At one extreme are philosophers who argue that consciousness does not serve any function at all. This position, dubbed "conscious inessentialism" or "epiphenomenalism," holds that consciousness is an epiphenomenal by-product of a skilled, nonconscious mind that does all the real work. Consciousness is like the child who "plays" a video game at an arcade without putting any money into it. He moves the controls, unaware that he is seeing a demonstration program that is independent of his actions. The child (consciousness) believes he is controlling the action, when in fact the software in the machine (nonconsciousness) is completely in control.[4]

The philosopher Daniel Dennett notes that this view equates consciousness more with the press secretary than with the president. The press secretary can observe and report on the workings of the mind but has no role in setting policy and is not privy to many of the decisions made behind the closed doors of the Oval Office. It's an observer, not a player.[5]

How can this be, you might ask, when it so often feels as though we are consciously controlling our actions? Recent work by Daniel Wegner and Thalia Wheatley suggests an answer: the experience of conscious will is often an illusion akin to the "third variable" problem in correlational data. We often experience a thought followed by an action, and assume it was the thought that caused that action. In fact a third variable, a nonconscious intention, might have produced both the conscious thought and the action. My decision to get up off the couch and get something to eat, for example, feels very much like a consciously willed action, because right before standing up I had the conscious thought "A bowl of cereal with strawberries sure would taste good right now." It is possible, however, that my desire to eat arose nonconsciously and caused both my conscious thought about cereal and my trip to the kitchen. The conscious thought might have been completely epiphenomenal and had no influence on my behavior, just as consciousness appears to be unnecessary in lower species in order for them to seek food and survive. Even humans sometimes behave in seemingly intentional ways in the absence of relevant conscious thoughts, such as when I find myself getting off the couch to get a bowl of cereal without ever consciously thinking about what I am doing or willing myself to do so.[6]

Wegner and Wheatley acknowledge that conscious will is not always an illusion, just that it *can* be. The most reasonable position, I believe, is between the extremes of consciousness-as-chief-executive and consciousness-as-epiphenomenal-press-secretary. If consciousness were purely epiphenomenal, then a book on self-insight would not be very satisfying. It might give people a better seat from which to observe the action, but these observations could not change the course or outcome

of the game. On the other hand, we have already seen that the adaptive unconscious is quite extensive and includes such higher-order, executive functions as goal-setting. Thus, I think the analogy of consciousness-as-chief-executive or head coach is also misleading. We may have the impression that we, our conscious selves, are in complete control, but that is at least in part an illusion.

The philosopher Owen Flanagan notes that different U.S. presidents have exerted differing amounts of control over governmental policy, and that a more accurate view of the role of consciousness may be consciousness-as–Ronald Reagan. According to many historians, Reagan was more of a figurehead than most presidents and did not exert very much control over the government. In Flanagan's words, "Reagan was the entertaining and eloquent spokesperson for a cadre of smart and hardworking powers (actually layers of powers), some known to outsiders, and some unknown. This is not to deny that Reagan felt as if he were in charge in his role as 'The Great Communicator' . . . The point is that one can feel presidential, and indeed *be* presidential, but still be less in control than it seems from either the inside or outside."[7]

In other words, we know less than we think we do about our own minds, and exert less control over our own minds than we think. And yet we retain some ability to influence how our minds work. Even if the adaptive unconscious is operating intelligently outside our purview, we can influence the information it uses to make inferences and form goals. One of the purposes of this book is to suggest ways this can be done.

In a memorable *Saturday Night Live* skit from the 1980s, President Reagan was portrayed as a brilliant, cunning leader whose "Great Communicator" persona was all a shtik. In public, he was the fatherly, slightly bumbling Hollywood actor the voters knew and loved. Behind the scenes, he was a ruthless visionary who could think circles around his aides and negotiate brilliantly with foreign leaders. (In one scene, he gets tough with an Iranian leader over the phone—while speaking Farsi.) The goal of this book is to make us all more like the Ronald Reagan in the skit—an executive who knows and manipulates, at least to some extent, what is going on behind the scenes.

Properties of the Adaptive Unconscious versus Consciousness

But what is going on behind the scenes, and how does this differ from conscious processing? It is useful to map out the different functions of these mental systems, which are summarized in the table.

The adaptive unconscious versus consciousness

Adaptive unconscious	Consciousness
• Multiple systems	• Single system
• On-line pattern detector	• After-the-fact check and balancer
• Concerned with the here-and-now	• Taking the long view
• Automatic (fast, unintentional, uncontrollable, effortless)	• Controlled (slow, intentional, controllable, effortful)
• Rigid	• Flexible
• Precocious	• Slower to develop
• Sensitive to negative information	• Sensitive to positive information

MULTIPLE VERSUS SINGLE SYSTEMS

As already noted it is a bit of a misnomer to speak of *the* adaptive unconscious, as there are a collection of modules that perform independent functions outside of conscious view. One way we know this is through studies of brain-damaged patients; different areas of the brain seem to be associated with quite different aspects of nonconscious learning and memory. Damage to some areas can impair explicit memory, for example (the ability to form new memories), but leave implicit memory intact (e.g., the ability to learn new motor skills). Strokes can impair language abilities without influencing other cognitive functions. Because the adaptive unconscious is a collection of many independent abilities, some of the properties of the adaptive unconscious I describe may apply to some modules more than to others.

Consciousness, on the other hand, seems to be a single entity. Exactly how to define it, and exactly how it is related to brain functioning, are not known. It is relatively clear, however, that it is a solitary mental system, not a collection of different modules. There may be special cases in

which consciousness can split into two or more independent systems, such as multiple personalities (although the exact nature and frequency of multiple-personality syndrome is the topic of much current debate). Most people, however, do not possess more than one conscious self. There is only one president, even if that entity does not have as much power or control as it thinks.

PATTERN DETECTOR VERSUS FACT CHECKER

A number of psychologists have argued that the job of the adaptive unconscious is to detect patterns in the environment as quickly as possible and to signal the person as to whether they are good or bad. Such a system has obvious advantages, but it also comes with a cost: the quicker the analysis, the more error-prone it is likely to be. It would be advantageous to have another, slower system that can provide a more detailed analysis of the environment, catching errors made by the initial, quick analysis. This is the job of conscious processing.

Joseph LeDoux, for example, suggests that humans have a nonconscious "danger detector" that sizes up incoming information before it reaches conscious awareness. If it determines that the information is threatening, it triggers a fear response. Because this nonconscious analysis is very fast it is fairly crude and will sometimes make mistakes. Thus it is good to have a secondary, detailed processing system that can correct these mistakes. Suppose that you are on a hike and suddenly see a long, skinny, brown object in the middle of the path. Your first thought is "snake!" and you stop quickly with a sharp intake of breath. Upon closer analysis, however, you realize that the object is a branch from a small tree, and you go on your way. According to LeDoux, you performed an initial, crude analysis of the stick nonconsciously, followed by a more detailed, conscious analysis. All in all, not a bad combination of systems to have.[8]

THE HERE-AND-NOW VERSUS THE LONG VIEW

Useful though the nonconscious pattern detector is, it is tied to the here-and-now. It reacts quickly to our current environment, skillfully detects

patterns, alerts us to any dangers, and sets in motion goal-directed behaviors. What it cannot do is anticipate what will happen tomorrow, next week, or next year, and plan accordingly. Nor can the adaptive unconscious muse about the past and integrate it into a coherent self-narrative. Among the major functions of consciousness are the abilities to anticipate, mentally simulate, and plan.

An organism that has a concept of the future and past, and is able to reflect on these time periods at will, is in a better position to make effective long-term plans than one that does not—providing a tremendous survival advantage. In some lower organisms, planning for the future is innate: squirrels "know" to store nuts for the winter, and migratory birds "know" when to fly south to warmer weather. Imagine the advantage of having a more flexible mental system that can muse, reflect, ponder, and contemplate alternative futures and connect these scenarios to the past. The practice of agriculture, for example, requires knowledge of the past and thinking about the future; why bother putting seeds in the ground now if we cannot envision what will happen to them over the next few weeks?

The idea that consciousness plans for the future probably does not come as much of a surprise. Those who endorse the consciousness-as-chief-executive model would agree that a major function of consciousness is to engage in long-term planning. A good CEO leaves the little stuff to underlings and spends his or her time on the big questions, such as what the long-term goals should be and how to implement them.

Our consciousness-as–Ronald Reagan model, however, portrays long-term planning a little differently. The federal government (the mind) is a vast, interrelated system that operates quite well on a day-to-day basis. The chief executive can look into the future and try to set long-term goals, but might find it difficult to make major changes in policy. Often the best he or she can do is to nudge the vast bureaucracy onto a slightly different course. In fact there is a danger to making major policy changes for which the rest of the mind is unsuited.

Consider Herman, who believes that he is a loner who is happiest when by himself doing his own thing, when in fact he has a strong,

nonconscious need for affiliation with other people. Because it is his conscious self-view that plans his future and determines his behavior, Herman avoids large gatherings and parties and chooses a career as a computer consultant so that he can work out of his home. His nonconscious need for affiliation is unfulfilled by these choices, however, leading to unhappiness. Perhaps the best use of consciousness is to put ourselves in situations in which our adaptive unconscious can work smoothly. This is best achieved by recognizing what our nonconscious needs and traits are and planning accordingly.[9]

But how do we recognize what our nonconscious needs and motives are? That is the million-dollar question. For now, I note simply that the ability to think about and plan for the future endows humans with a tremendous advantage, but can be a two-edged sword. Following our conscious wishes can be problematic if they conflict with the desires of the adaptive unconscious.

AUTOMATIC VERSUS CONTROLLED PROCESSING

It is well known that people can perform many behaviors (e.g., riding a bicycle, driving a car, playing the piano) quickly, effortlessly, and with little conscious attention. Once we have learned such complex motor behaviors, we can perform them better when we are on automatic pilot and are not consciously thinking about what we are doing. The moment I begin to think about what my pinkie and index fingers are doing as I type these words, typos result. There is a term for this in athletics: when a player is "unconscious," she is performing at an optimal level without any awareness of exactly *what* she is doing. She is in the zone.

Although we do not often conceive of thinking in the same way, it, too, can happen automatically. Just as playing the piano can become automatic, so can habitual ways of processing information about the physical and social world. Indeed, a defining feature of the adaptive unconscious is its ability to operate on automatic pilot. Automatic thinking has five defining features: it is nonconscious, fast, unintentional, uncontrollable, and effortless. As noted by the social psychologist John Bargh, different kinds of automatic thinking meet these criteria to varying degrees; for

our purposes we can define automaticity as thinking that satisfies all or most of these criteria.

We have already encountered examples of this type of thinking in Chapter 2—namely, the way in which the adaptive unconscious selects, interprets, and evaluates incoming information. Consider the cocktail-party phenomenon, in which the adaptive unconscious blocks out all the conversations except the one we are in, but at the same time monitors what other people are saying (and alerts us if they say something important, such as our name). This process meets all five of the criteria of automaticity: it occurs quickly, nonconsciously, and without intention, in the sense that our nonconscious filter operates even when we have no intention that it do so. It is uncontrollable, in the sense that we have little say over the operation of the nonconscious filter and could not stop it if we tried. Finally, it operates effortlessly, in the sense that the nonconscious filter takes up little mental energy or resources.

Another example of automatic thinking is the tendency to categorize and stereotype other people. When we meet somebody for the first time, we pigeonhole them according to their race or gender or age very quickly, without even knowing we are doing so. This process of automatic stereotyping is probably innate; we are prewired to fit people into categories. The nature of the pigeonholes, however—the content of our stereotypes—is certainly not innate. No one is born with a specific stereotype about another group, but once we learn these stereotypes, usually from our immediate culture, we are inclined to apply them nonconsciously, unintentionally, uncontrollably, and effortlessly. In contrast, conscious thinking occurs more slowly, with intention (we typically think what we want to think), control (we are better able to influence what we think about), and effort (it is hard to keep our conscious minds on something when we are distracted or preoccupied).[10]

THE RIGIDITY OF THE ADAPTIVE UNCONSCIOUS

A disadvantage of a system that processes information quickly and efficiently is that it is slow to respond to new, contradictory information. In fact we often unconsciously bend new information to fit our

preconceptions, making it next to impossible to realize that our preconceptions are wrong. An example is my assumption that Phil, the man I met at a PTO meeting, was the pushy, rude fellow I had heard about, when in fact he was not.

What happens when the nonconscious system quickly detects a violation of a pattern? Does it recognize that the old way of seeing things no longer applies? Suppose, for example, that a business manager notices (at a nonconscious level) that the last two employees she had to fire had degrees from small, liberal-arts colleges and that the last three people she promoted had degrees from large, state universities. It is now job-performance time, and the manager is evaluating a new batch of employees, some of whom went to small, liberal-arts colleges and some of whom went to state universities. On average, the two groups have performed at the same level, although each did better on some tasks than on others. How will the manager evaluate these employees?

A smart, flexible system would recognize that the previously learned correlation, from a very small sample, does not generalize to this larger sample of employees. And yet once a correlation is learned, the nonconscious system tends to see it where it does not exist, thereby becoming more convinced that the correlation is true. When evaluating the employees who went to small colleges, the manager may focus on and remember the times they did poorly. When evaluating the employees who went to large universities, she is likely to focus on and remember the times they did well, thereby strengthening her belief that the size of a person's alma mater is predictive of job performance—even though it is not.

Even worse, people can unknowingly behave in ways that make their expectations come true, as in Robert Rosenthal and Lenore Jacobson's classic research on the self-fulfilling prophecy. They found that teachers not only view their students in the ways that they expect them to be, but act in ways that make these expectations come true. At the beginning of the school year, they administered a test to all the students in an elementary school and told the teachers that some of the students had scored so

well that they were sure to "bloom" academically. In fact this was not necessarily true: the students identified as "bloomers" had been chosen randomly by the researchers. Neither the students nor their parents were told anything about the results of the test. The "bloomers" differed from their peers only in the minds of the teachers.

When researchers tested all the children again at the end of the year with an actual I.Q. test, the students who had been labeled as bloomers showed significantly higher gains in their I.Q. scores than the other students did. The teachers had treated the bloomers differently, in such a way that made their expectations come true.

The teachers' expectations about their students were conscious, but the way in which they made their expectations come true was not. When the teachers expected their students to do well, they unknowingly gave them more personal attention, challenged them more, and gave them better feedback on their work. Myra and David Sadker suggest that a similar self-fulfilling prophecy, operating at a nonconscious level, influences the relative performance of boys and girls in American classrooms. At a conscious level, most teachers believe that girls and boys are receiving equal treatment. In one study, the Sadkers showed teachers a film of a classroom discussion and asked who was contributing more to that discussion—boys or girls. The teachers said that the girls had participated more than the boys. Only when the Sadkers asked the teachers to watch the film and count the number of times boys and girls talked did the teachers realize that the boys had outtalked the girls by a factor of three to one.

At a nonconscious level, argue the Sadkers, teachers often treat boys in more favorable ways than girls, thereby causing boys to do better in their classes. The nonconscious mind can jump to conclusions quite quickly ("the boys in my math class are smarter"), leading teachers to treat boys in preferential ways—even when they believe, consciously, that they are treating everyone the same.[11]

It is fair to say that the tendency for the adaptive unconscious to jump to conclusions, and to fail to change its mind in the face of contrary

evidence, is responsible for some of society's most troubling problems, such as the pervasiveness of racial prejudice (discussed in Chapter 9). Why would an *adaptive* unconscious lead to such erroneous inferences? Again, the fact that mental processes have conferred a survival advantage does not mean that they are error free; in fact the advantages they bring (e.g., quick appraisals and categorizations) often have unfortunate by-products.

DOING BEFORE KNOWING

Children are especially likely to act on automatic pilot, with their adaptive unconscious guiding their behavior in sophisticated ways before they are aware of what they are doing or why they are doing it. Nonconscious skills such as implicit learning and implicit memory appear early, before children have the ability to reason consciously at a very sophisticated level. Infants have the ability to remember things implicitly (nonconsciously) at birth or even before (in utero), whereas the ability to remember things explicitly (consciously) does not begin to develop until the end of the first year of life. Further, the parts of the brain that appear to be involved in explicit memory develop later in childhood than the parts of the brain that are involved in implicit memory.[12]

Adults are often in the same quandary: they have no access to their nonconscious minds and have to rely on their conscious interpreters to figure out what is going on inside their own heads. Adults, at least, have a sophisticated, clever interpreter that often constructs an accurate narrative. Children are especially likely to be in the dark, because their conscious interpreter develops more slowly and does not yet have the sophistication to guess what the nonconscious mind is doing.

This predicament creates a dilemma for psychologists interested in the development of the mind. One of the easiest ways of assessing what people are thinking is to ask them, and many studies of cognitive development rely on children's self-reports. Because the conscious system develops more slowly than the nonconscious one, relying solely on these reports can yield a misleading answer about the age at which a specific

skill or trait develops. This error has been made in some well-known areas of developmental research.

When do children learn the discounting principle? Both Suzie and Rosemary practiced the piano for half an hour. Suzie's mother gave her an ice cream cone for practicing the piano, whereas Rosemary practiced without receiving an ice cream cone. Who liked playing the piano more? Most adults say that Rosemary did, assuming that Suzie might have been motivated in part by the reward. Because Rosemary practiced without receiving any reward, she probably was motivated more by the intrinsic joy of playing. This is known as the *discounting principle,* the tendency to lower our estimate of the causal role of one factor (intrinsic interest in piano playing) to the extent that other plausible causes are present (the ice cream cone).

Developmental psychologists have been interested in the age at which children begin to use the discounting principle. In the typical study, children listen to stories like the one about Suzie and Rosemary and report who liked the activity more. Before the age of eight or nine, children seem to use an additivity principle, whereby they think that people who performed activities for a reward like it more (assuming that intrinsic interest + a reward = greater intrinsic interest). By the age of eight or nine, children begin to use the discounting principle, assuming that people who do things for rewards like them less than people who do not (e.g., intrinsic interest + a reward = less intrinsic interest).

But studies that rely on what children do instead of what they say show that children can use the discounting principle at a much earlier age than eight or nine. In these studies, children are given a reward for performing an attractive activity themselves, and their subsequent interest in the activity is measured by observing how much they choose to engage in it. For example, Mark Lepper, David Greene, and Richard Nisbett asked three- to five-year-old preschool children to draw with felt-tip pens, which at the time was a novel, fun activity for young children. Some of the kids were rewarded with a "Good Player Certificate" for drawing with the pens and some were not.

Later the researchers put the pens in the classroom during a free-play period and measured how much time each child spent playing with them. As predicted, the children who had been rewarded earlier played with the pens significantly less than those who had not been rewarded. They seemed to have applied the discounting principle to their own behavior, concluding—not necessarily consciously—that if they played with the pens in order to get the Good Player Certificate, they must not have liked the pens very much.[13]

Why don't children use this same discounting principle when explaining other people's behavior until the age of eight or nine? Perhaps the adaptive unconscious learns the discounting principle earlier than the conscious interpreter. Young children act according to the discounting principle because their nonconscious inference system is driving their behavior (e.g., whether they play with the pens in the classroom). Interpreting behavior consciously and verbally reporting why it occurred, however, is the job of the conscious system, which takes longer to learn and apply the discounting principle.

This schism between what people do and what they say persists into adulthood. On the basis of what they do, adults often seem to have discounted their interest in a rewarded activity. During unconstrained, free-time periods, those who have been rewarded for engaging in the activity (such as playing with puzzles) spend less time with the activity than do people who have not been rewarded for engaging in the activity. Given what people reported, however, they did not seem to have discounted their interest in the activity: they said they liked the activity as much as people who had not been rewarded.

If there really are two systems implicated in these studies, a nonconscious one that determines what people do and a conscious one that determines what people say, are there ways of getting them more in synch? How can the conscious system do a better job of inferring what the nonconscious system already knows? Given that consciousness appears to take longer to learn the discounting principle, maybe it needs a little more of a nudge to apply it. That is, whereas the nonconscious sys-

tem discounts intrinsic interest in the presence of rewards quite readily, maybe the conscious system has to think about it a little more carefully. I tested this hypothesis with Jay Hull and Jim Johnson in a study in which college students were given a reward to play with an interesting puzzle. As in many studies of this type, the students' behavior indicated that the reward reduced their interest in the puzzle: they played with the puzzle less in a subsequent, free-time period than did unrewarded students.

As is also common, however, the students did not report, on a questionnaire, that they disliked the puzzle—unless they had first been asked to think about the reasons for their actions. Whereas putting people in this reflective mode did not, for the most part, influence their behavior—they still engaged less in an activity if they had been rewarded for it—it did influence their reported liking for the activity. When in the reflective mode, people who were rewarded for doing the activity now reported that they liked it less. These results suggest that when people think about it carefully, they can apply the discounting principle, deducing that they must like an activity less if they were rewarded for doing it. If they are not thinking carefully about it, however, their conscious system fails to apply the discounting principle (which, after all, was learned rather late in development)—even though the adaptive unconscious already has.[14]

When do children acquire a theory of mind? At some point, people come to realize that they are not the only ones with a mind—other people have them, too. Because we cannot tell this directly by looking inside another person's head, we develop what psychologists call a *theory of mind*—the inference that other people have thoughts, beliefs, and feelings, just as we do. We believe that humans and inanimate objects are quite different (humans have minds, rocks do not), we often look where other people are looking (we want to learn what they are thinking that we are not), we can pretend to be someone else (by simulating their thoughts and feelings), and we often try to deceive other people (by encouraging them to develop false beliefs). All these are signs that we have a theory of mind.

We rarely pretend to be a rock or try to deceive a tree, precisely because we presume that they do not have minds that contain beliefs, thoughts, and feelings.

The prevailing wisdom is that a theory of mind develops around the age of four, as shown by children's performance in what is called the false-belief paradigm. In a typical study, children watch an actor place something in a hidden location. They might see Matt, for example, hide a piece of candy in a box and leave the room. Sally then enters the room, finds the piece of candy, and puts it in a basket a few feet away. When Sally leaves and Matt returns, the stage is set. Where will Matt look for the candy: in the box where he put it, or in the basket where Sally hid it? Most four-year-olds reply to this question by saying, "the box where he hid it." They recognize the seemingly obvious point that Matt still believes the candy is in the box because he did not see Sally put it in the basket. Most three-year-olds, however, say that Matt will look in the basket where Sally hid the candy. They seem unable to separate their own knowledge from another person's, assuming that because they know that the candy is in the basket, Matt knows this too. They do not yet have a well-developed theory of mind that tells them that other people can have different beliefs from their own.

Or do they? Wendy Clements and Josef Perner performed an intriguing variation on the false-belief task that suggests that even three-year-olds have a theory of mind, at least at an implicit or nonconscious level. Their study was very much like the one described above, except that in addition to asking the children where Matt would search for the candy, they also observed where the children looked when Matt returned to the room: Did they look in the location in which Matt had hidden it, or in the location where it had been moved by someone else? The researchers assumed that children would look first to the location in which they anticipated Matt would search for the candy. If they had a correct theory of mind, they should look where Matt thought the candy was, not where they knew it was. If they did not have a correct theory of mind, they should look where they knew it was, not where Matt thought it was.

On the standard measure of where children say Matt will look, the researchers found the same thing as previous studies: almost none of the very young children (those between the age of two years five months and two years ten months) got the question "right"; that is, almost all of them said that Matt would look for the candy in the basket, where they knew it to be—suggesting that they did not yet have a theory of mind. In the older groups, the percentage of children who gave the right answer steadily increased, such that by the age of four, most of the children gave the right answer.

As for where children looked when Matt reentered the room, the youngest children's gaze was consistent with their verbal reports: they looked at the basket where they knew the candy was and said that this was where Matt would look. That is, both measures indicated that these children did not have a theory of mind. However, the two measures diverged dramatically in children right around three years of age. They looked in the correct location, even though they gave a different answer when asked where Matt would search for the candy. Judging by what these children did, they had developed a theory of mind earlier than revealed by what they said. The children who were three years eight months and older looked in the correct location and gave the correct answer when asked.[15]

The best explanation of this and subsequent studies is that the looking and verbal measures reflect different kinds of knowledge that develop at different rates. The looking measure may have tapped a nonconscious, implicit type of knowledge—in my terms, knowledge acquired by the adaptive unconscious—whereas the verbal measure tapped a conscious understanding of the theory of mind that takes longer to develop.

There is even evidence that nonhuman primates have a rudimentary theory of mind, judging by where they look during a false-belief task like the one described above. Thus, very young children, and possibly even nonhuman primates, may possess a nonconscious theory of mind that guides their behavior. This view is quite compatible with the developmental literature on children's understanding of the discounting principle. Developmental psychologists who rely too heavily on verbal

measures may not be giving children their due. They are studying children's verbal, conscious system, which may develop more slowly than the adaptive unconscious.[16]

Does the conscious system ever catch up? Perhaps people's conscious abilities are especially limited early in life, but when they reach adulthood they acquire a full-blown, conscious self and achieve greater insight into their adaptive unconscious. Although people's conscious theories and insights surely become more sophisticated as they age, there is reason to believe that people do not gain perfect insight.

One example is people's ability to detect complex patterns in the environment. As we have seen, the nonconscious system is skilled at quick, accurate pattern detection. Recall the study by Pawel Lewicki, Thomas Hill, and Elizabeth Bizot mentioned in Chapter 2, in which people learned a very complex rule that predicted where the letter *X* would appear on a computer screen, as indicated by the fact that their performance improved over time and deteriorated when the rule was changed. None of the participants ever learned the rule consciously; the adaptive unconscious clearly outperformed the conscious system in this case.

Numerous studies on covariation detection show that the conscious system is notoriously bad at detecting correlations between two variables (e.g., whether there is a relationship between people's hair color and their personalities). In order to detect such relationships, the correlation has to be very strong, and people must not have a prior theory that misleads them about this correlation. For example, many people persist in believing that they are more likely to catch a cold when they go outside without a coat on a winter day, even though there is no evidence that exposure to cold weather is related to catching a cold. Most people are unaware of the relationship between touching their noses and eyes with their fingers and catching a cold, even though there is good evidence that this is the main way in which rhinoviruses enter our bodies. The adaptive unconscious is not perfect and may not have recognized this covariation either. Or maybe it has, preventing us from touching our eyes even more than we do![17]

IS THE ADAPTIVE UNCONSCIOUS MORE SENSITIVE TO NEGATIVE INFORMATION?

Now we come to the most speculative point about differences between nonconscious and conscious processing: there may be a division of labor in the brain, in which the unconscious is more sensitive to negative information than the conscious self.

As mentioned earlier, Joseph LeDoux has shown that animals and people possess preconscious danger detectors that size up their environments very quickly. The sensory thalamus evaluates incoming information before it reaches conscious awareness. If it determines that the information is threatening, it triggers a fear response. In evolutionary terms, it can be seen how adaptive it is for the brain to trigger a fear reaction to a dangerous (i.e., negative) stimulus as soon as possible.

Recall also the experiment by Antoine Bechara and his colleagues, in which people developed gut responses signaling them which decks of cards had the better monetary payoffs—before they knew consciously which decks were the best. The cards in decks A and B resulted in large gains or losses of money, adding up to a net loss if played consistently. The cards in decks C and D resulted in small gains or losses of money, adding up to a net gain if played consistently. People quickly developed gut reactions (as indicated by their skin conductance responses) warning them that decks A and B were to be avoided.

But how did their adaptive unconscious figure this out? One possibility is that it kept a mental tally of the different cards and figured out that on balance, decks A and B resulted in a net loss. It is also possible, however, that it had a simpler strategy: avoid big losses. If the nonconscious system is especially sensitive to negative information, it should focus on the large losses that sometimes came up in deck A. An intriguing implication of this finding is that the nonconscious system will not always make the correct choice. For example, if on balance decks A and B resulted in a higher payoff despite its occasional big losses, then the adaptive unconscious would shy away from the decks that would make the most money.[18]

There is increasing evidence that positive and negative information is

processed in different parts of the brain, though the extent to which these different brain regions map onto conscious versus nonconscious processing is unclear. There is at least the possibility that the adaptive unconscious has evolved to be a sentry for negative events in our environments.[19]

Is the Adaptive Unconscious Smart or Dumb?

So which part of the mind is smarter, anyway? This question has been posed by several researchers, notably the social psychologist Anthony Greenwald. Greenwald concluded that unconscious cognition is a rather primitive system that can analyze information in only limited ways. He suggested that modern research has revealed a very different kind of unconscious from the Freudian unconscious, one that is considerably less clever.

Greenwald focused mostly on research that presents words to people at speeds too fast to be perceived consciously. Several studies have found that such subliminally presented words can influence people's responses to some extent. For example, Draine and Greenwald presented people with words on a computer (e.g., "evil," "peace") and asked them to make very quick judgments of whether they were good or bad in meaning. Unbeknownst to participants, these words were preceded by very fast presentations of "priming" words that were also good or bad in meaning. The prime words were flashed so quickly that people did not see them consciously. Nonetheless, they influenced people's responses to the second, target words. When the prime word was opposite in valence to the target word—for example, when "peace" was preceded by a subliminal presentation of "murder"—people were more likely to make a mistake and judge "peace" as bad. When the prime word was the same valence as the target—for example, when "peace" was preceded by a subliminal presentation of "sunset"—people made very few mistakes in judging "peace" as good. Most psychologists view this as evidence that people unconsciously saw the subliminal word and processed its mean-

ing, which either interfered with or helped their judgment of the second word.[20]

Greenwald notes, however, that the unconscious mind's ability to recognize and process subliminally presented words is limited. There is no evidence, for example, that it can perceive the meaning of a two-word sequence that is different from the meaning of each individual word. Consider the words "enemy loses," which have a positive meaning when read as a unit, but a negative meaning when each word is considered individually. When two-word sequences such as this are flashed subliminally, people extract the meaning of the individual words (negative, in the example above), not the meaning of the unit. Hence, the unconscious mind may have limited cognitive abilities.

This conclusion is at odds, however, with much of what we have just reviewed—for example, research showing that the nonconscious mind is superior to the conscious mind in detecting covariations in the environment. It is no surprise, perhaps, that our minds can make limited judgments of information that it saw for only a few hundredths of a second. What is more surprising is that it can detect any meaning from a word that is flashed so quickly. In fact, a point that is often overlooked is that the unconscious mind is doing a superior job to the conscious mind on these tasks. Even if it is making only rudimentary judgments of subliminally flashed words, it is still doing better than the conscious mind, which has no idea that it saw anything at all. On these tasks, the unconscious mind is a lot smarter than the conscious interpreter.

What about when people have more time to examine and process incoming information? As we have seen, the nonconscious mind still outperforms the conscious self on at least some tasks, such as covariation detection. One study found, for example, that people could learn a complicated rule in which the presentation of a stimulus on one trial depended on what had been presented seven trials earlier, even though they could not consciously remember what had been presented that long ago.[21]

To be sure, the adaptive unconscious can be rigid and inflexible, clinging to preconceptions and stereotypes even when they are disconfirmed,

in contrast to the more flexible conscious mind. There is no single answer to the question of how smart or dumb each system is—it depends on what you ask them to do. The adaptive unconscious is smarter than the conscious mind in some ways (e.g., detecting covariation), but less smart in other ways. The bottom line is that it is different, and whether we assign the labels "smart" or "dumb" to these differences is arbitrary. A more useful approach is to map out the differences and try to understand the functions of the two systems. The adaptive unconscious is an older system designed to scan the environment quickly and detect patterns, especially ones that might pose a danger to the organism. It learns patterns easily but does not unlearn them very well; it is a fairly rigid, inflexible inferencemaker. It develops early and continues to guide behavior into adulthood.

Rather than playing the role of CEO, the conscious self develops more slowly and never catches up in some respects, such as in the area of pattern detection. But it provides a check-and-balance to the speed and efficiency of nonconscious learning, allowing people to think about and plan more thoughtfully about the future.

It is tempting to view the tandem of nonconscious and conscious thinking as an extremely well-designed system that operates optimally. But this would be a mistake. First, there was no grand design. In real engineering, old designs can be completely thrown out and new ones started from scratch. The Wright brothers, for example, did not take a horse buggy and stick some wings on it to make a flying machine; they were able to begin afresh and build every part of their plane with the final goal (to fly) in mind. By contrast, natural selection operates on the current state of an organism, such that new systems evolve out of old ones. It is not as if someone sat down in advance and drew up the blueprints for the grand design of the human mind. Evolution works with what it has.

The human mind *is* an incredible achievement, perhaps the most amazing in the history of the Earth. This does not mean, however, that it is an optimal or perfectly designed system. Our conscious knowledge of ourselves can be quite limited, to our peril.

18. See Erdelyi (1985); Westen (1998).
19. A. Freud (1966), p. 28.

2. The Adaptive Unconscious

Epigraphs: Hamilton (1865), p. 241; Dallas (1866), p. 194.

1. See Cole (1995) for a fascinating discussion of Ian Waterman's case.
2. Proffitt et al. (1995); Rock (1997).
3. See, for example, Simon (1997).
4. Freud (1924/1968), p. 306.
5. James Miller (1942) offered sixteen distinct definitions of the unconscious. This number is rivaled only by the number of definitions many authors have offered for consciousness (see, e.g., Ryle 1949).
6. Others have used the term the "cognitive unconscious" or the "emotional unconscious" to describe processes I ascribe to the adaptive unconscious (e.g., Kihlstrom 1987, 1999). I believe it makes more sense to consider nonconscious processing as a whole, rather than drawing lines between what is cognitive and what is emotional.
7. See Nørretranders (1998) for a detailed discussion of how scientists have measured the capacity of consciousness versus the capacity of our sensory systems.
8. Claparède's (1911/1951) patient may not have been completely amnesiac and thus may have retained some limited abilities to learn things consciously. More typically, amnesiacs are able to learn motor skills, such as tracking a moving target with a stylus, with no conscious memory of ever having performed the task from one day to the next (see Schacter 1996).
9. For a review see Kihlstrom and Schacter (1990).
10. See, e.g., Reber (1993, 1997) and Dulany (1997).
11. Lewicki, Hill, and Bizot (1988), quotation p. 33.
12. Although there is some disagreement on the exact location of the filter in the attentional system (e.g., Deutsch and Deutsch 1963; Treisman 1964; Norman 1968; Marcel 1983), there is agreement that the filter operates largely outside of conscious awareness.
13. Conscious control over the settings of the filter is not perfect. As noted by Daniel Wegner (1994), the desire to attend to something sometimes fails, such that our attention is drawn to precisely what we are trying to ignore.
14. The "cocktail party effect," whereby people recognize their name in an unattended auditory channel, was first demonstrated by Moray (1959).

The nonconscious monitor is not perfect; typically, people notice their name in the unattended channel about a third of the time. The fact that they are able to recognize it at all suggests that nonconscious monitoring is occurring. For theories of preattention, see Broadbent (1958) and Treisman (1993).

15. See Bargh and Pietromonaco (1982); Higgins (1996); Mandler (1997).
16. See Damasio (1994); LeDoux (1996); Bargh (1997); Bechara et al. (1997); Clore, Gasper, and Garvin (2001).
17. Bargh et al. (2002); Bargh and Raymond (1995).
18. Brontë (1847/1984), p. 270.
19. Damasio (1994).
20. Brontë (1847/1984), p. 259.
21. Gilbert and Wilson (2000). See also Vaillant (1993).
22. See Heine, Lehman, Markus, and Kitayama (1999). Even within a culture, the ways in which people make themselves feel good vary. Bill Swann (1996) has observed that in Western cultures, people with high and low self-esteem react differently to positive and negative feedback. People high in self-esteem prefer positive feedback and attempt to avoid or discount negative feedback, as any good spin doctor would. People low in self-esteem sometimes do the opposite: they prefer negative feedback and avoid or discount positive feedback. This does not necessarily mean, however, that people with low self-esteem fail to use the "feel-good" criterion. Swann argues that people often desire predictable, coherent feedback and that it is very unsettling to have their views of themselves challenged. This explains why people with negative self-esteem, who have low opinions of themselves, prefer negative feedback about themselves: it helps them maintain a predicable, coherent self-view. In short, it satisfies the "feel-good" criterion, albeit in a rather paradoxical way.
23. See Taylor and Brown (1988). I discuss work on positive illusions in more detail in Chapter 9.

3. Who's in Charge?

Epigraph: James (1890), p. 122.

1. The extent to which such evolutionary adaptations explain current human behavior, such as gender differences in mate selection, is hugely controversial. In my opinion, evolutionary psychologists sometimes go too far in claiming that much of current social behavior can be traced back to human

adaptations that occurred thousands of years ago. Nonetheless it cannot be denied that the brain has evolved according to the principles of natural selection (see, e.g., Kaas and Collins 2001).

2. See Reber (1992) for an insightful elaboration of this argument.
3. Güzeldere (1997).
4. See Flanagan (1992) for an excellent review of these philosophical positions.
5. See Flanagan (1992), p. 7.
6. Wegner and Wheatley (1999).
7. Flanagan (1992), pp. 7–8.
8. Margolis (1987); LeDoux (1996).
9. See Bargh et al. (2002) for a discussion of the role of consciousness in fulfilling nonconscious needs.
10. Whereas it is true that conscious processes are more controlled than most nonconscious processes, not all nonconscious processing meets all the definitions of automaticity. Arthur Reber (1992), for example, notes that learning an artificial grammar occurs nonconsciously but requires cognitive capacity. Further, we are not always in complete control of our conscious thoughts. Automatic, nonconscious processes can lead to intrusions of unwanted thoughts, as documented by Daniel Wegner (1994). In general, however, it is fair to characterize most nonconscious thinking as automatic and most conscious thinking as controlled.
11. See Rosenthal and Jacobson (1968); Sadker and Sadker (1994).
12. For a review of research on implicit and explicit memory, see Schacter (1996).
13. Lepper, Greene, and Nisbett (1973).
14. Wilson, Hull, and Johnson (1981); Wilson (1985). For recent reviews of research on the effects of rewards on intrinsic interest, see Lepper, Henderlong, and Gingras (1999); Deci, Koestner, and Ryan (1999).
15. Clements and Perner (1994).
16. See Hauser (1998); Perner and Clements (2000), Wellman, Cross, and Watson (2001). For evidence that other implicit, nonconscious memory systems develop at the same rate as explicit memory, see Komatsu, Naito, and Fuke (1996) and Rovee-Collier (1997).
17. For evidence on the difficulty of consciously detecting correlations, see Nisbett and Ross (1980); Crocker (1981); and Alloy and Tabachnik (1984).
18. I thank Jonathan Schooler for pointing out this interpretation of the Bechara et al. (1997) experiment.

19. For evidence that negative and positive information is processed in different regions of the brain, see Davidson (1995) and Cacioppo, Gardner, and Berntson (1997).
20. Draine and Greenwald (1999).
21. See Millward and Reber (1972); Greenwald (1992).

4. Knowing Who We Are

Epigraphs: Amiel (1899/1935), quoted by Whyte (1978), p. 157; Didion (1979), p. 11.

1. Shaw (1913/1979), p. 43.
2. Allport (1961), p. 28.
3. See, e.g., Tellegen et al. (1988); McCrae and Costa (1990); Loehlin (1992); Goldberg (1993); Plomin (1994).
4. Sampson (1989); Gergen (1991).
5. See Mischel (1968, 1973). Subsequent research by Triandis (1989) and Markus and Kitayama (1991) shows that overlooking situational influences is especially predominant in individualistic Western cultures. Cultures with a more collectivist orientation, such as many Asian cultures, recognize more that the social situation is a powerful determinant of behavior.
6. See Nisbett (1980); Ross and Nisbett (1991); Funder (1997).
7. Hogan, Johnson, and Briggs (1997). A more recent handbook of personality includes a chapter on the modern approach to the unconscious (Kihlstrom 1999), but the remaining twenty-seven chapters, save one on psychoanalysis, say little about nonconscious processes and personality.
8. Contrary to my argument, Reber (1992) suggests that there are relatively few individual differences in nonconscious processing. However, Reber focuses exclusively on such invariant systems as implicit learning and memory. He may well be correct that these basic functions of the mind vary little across people, just as there is little variation in our ability to acquire language. I take a broader view of the adaptive unconscious, including people's unique environmental adaptations of which they are not fully aware, including their chronic levels of motivation, their chronic construals of the environment, and their chronic representations of other people.
9. Miller (1995), p. 64.
10. For a review, see Mischel and Shoda (1999). The experiment with boys in the residential camp is described in Shoda, Mischel, and Wright (1994).
11. Kelly (1955).