Adapted from *How We Decide* by Jonah Lehrer

In 1982, a patient named Elliot walked into the office of neurologist Antonio Damasio. A few months earlier, a small tumor had been cut out of Elliot's cortex, near the frontal lobe of his brain. Before the surgery, Elliot had been a model father and husband. He'd held down an important management job in a large corporation and was active in his local church. But the operation changed everything. Although Elliot's IQ had stayed the same—he still tested in the 97th percentile—he now exhibited one psychological flaw: he was incapable of making a decision.

This dysfunction made normal life impossible. Routine tasks that should have taken ten minutes now required several hours. Elliot endlessly deliberated over irrelevant details, like whether to use a blue or black pen, what radio station to listen to, and where to park his car. When he chose where to eat lunch, Elliot carefully considered each restaurant's menu, seating plan, and lighting scheme, and then drove to each place to see how busy it was. But all this analysis was for naught: Elliot still couldn't decide where to eat. His indecision was pathological.

Before long, Elliot was fired from his job. That's when things really began to fall apart. He started a series of new businesses, but they all failed. He was taken in by a con man and was forced into bankruptcy. His wife divorced him. The IRS began an investigation. He moved back in with his parents. As Damasio put it, "Elliot emerged as a man with a normal intellect who was unable to decide properly, especially when the decision involved personal or social matters."

But why was Elliot suddenly incapable of making good decisions? What had happened to his brain? Damasio's first insight occurred while talking to Elliot about the tragic turn his life had taken. "He was always controlled," Damasio remembers, "always describing scenes as a dispassionate, uninvolved spectator. Nowhere was there a sense of his own suffering, even though he was the protagonist . . . I never saw a tinge of emotion in my many hours of conversation with him: no sadness, no impatience, no frustration." Elliot's friends and family confirmed Damasio's observations: ever since his surgery, he'd seemed strangely devoid of emotion, numb to the tragic turn his own life had taken.

To test this diagnosis, Damasio hooked Elliot to a machine that measured the activity of the sweat glands in his palms. (When a person experiences strong emotions, the skin is literally aroused and the hands start to perspire. Lie detectors operate on the basis of this principle.) Damasio then showed Elliot various photographs that normally triggered an immediate emotional response: a severed

foot, a naked woman, a house on fire, a hand gun. The results were clear: Elliot felt nothing. No matter how grotesque or aggressive the picture, his palms never got sweaty. He had the emotional life of a mannequin.

This was a completely unexpected discovery. At the time, neuroscience assumed that human emotions were *irrational.* A person without any emotions—in other words, someone like Elliot—should therefore make better decisions. His cognition [reasoning] should be uncorrupted. The charioteer should have complete control.

What, then, had happened to Elliot? Why couldn't he lead a normal life? To Damasio, Elliot's pathology [diagnosis] suggested that emotions are a crucial part of the decision-making process. When we are cut off from our feelings, the most banal [boring] decisions became impossible. A brain that can't feel can't make up its mind.

Make a prediction: Why would a person who no longer felt any emotions, have a hard time making rational decisions?

AFTER INTERVIEWING ELLIOT, Damasio began studying other patients with similar patterns of brain damage. These patients all appeared intelligent and showed no deficits on any conventional cognitive tests. And yet they all suffered from the same profound flaw: because they didn't experience emotion, they had tremendous difficulty making any decisions. In *Descartes' Error,* Damasio described what it was like trying to set up an appointment with one of these emotionless patients:

I suggested two alternative dates, both in the coming month and just a few days apart from each other. The patient pulled out his appointment book and began consulting the calendar. The behavior that ensued, which was witnessed by several investigators, was remarkable. For the better part of a half hour, the patient enumerated reasons for and against each of the two dates: previous engagements, proximity to other engagements, possible meteorological conditions, virtually anything that one could reasonably think about concerning a simple date. . . . He was now walking us through a tiresome cost-benefit analysis, an endless outlining and

fruitless comparison of options and possible consequences. It took enormous discipline to listen to all of this without pounding on the table and telling him to stop.

Based on these patients, Damasio began compiling a map of feeling, locating the specific brain regions responsible for generating emotions. Although many different cortical areas contribute to this process, one part of the brain seemed particularly important: a small circuit of tissue called the orbitofrontal cortex, which sits just behind the eyes, in the underbelly of the frontal lobe. *(Orbit* is Latin for "eye socket.") If this fragile fold of cells is damaged by a malignant tumor or a hemorrhaging artery, the tragic result is always the same. At first, everything seems normal, and after the tumor is removed or the bleeding is stopped, the patient is sent home. A full recovery is forecast. But then little things start to go awry. The patient begins to seem remote, cold, distant. This previously responsible person suddenly starts doing irresponsible things. The mundane choices of every day life become excruciatingly difficult. It's as if his very personality—the collection of wants and desires that defined him as an individual—had been systematically erased. His loved ones say it's like living with a stranger, only this stranger has no scruples.

The crucial importance of our emotions—the fact that we can't make decisions without them—contradicts the conventional view of human nature, with its ancient philosophical roots. For most of the twentieth century, the ideal of rationality was supported by scientific descriptions of human anatomy. The brain was envisioned as consisting of four separate layers, stacked in ascending order of complexity. (The cortex was like an archaeological site: the deeper you dug, the farther back in time you traveled.) Scientists explained the anatomy of the human brain in this manner: At its bottom was the brain stem, which governed the most basic bodily functions. It controlled heartbeat, breathing, and body temperature. Above that was the diencephalon, which regulated hunger pangs and sleep cycles. Then came the limbic region, which generated animal emotions. It was the source of lust, violence, and impulsive behavior. (Human beings shared these three brain layers with every other mammal.) Finally, there was the magnificent frontal cortex—the masterpiece of evolution—which was responsible for reason, intelligence, and morality. These convolutions of gray matter allowed each of us to resist urges and suppress emotions. In other words, the rational fourth layer of the brain allowed us to ignore the first three layers. We were the only species able to rebel against primitive feelings and make decisions that were dispassionate and deliberate.

But this anatomical narrative is *false.* The expansion of the frontal cortex during human evolution did not turn us into purely rational creatures, able to ignore our impulses. In fact, neuroscience now knows that the opposite is true: a significant part of our frontal cortex is involved with emotion. David Hume, the eighteenth-century Scottish philosopher who delighted in heretical [unconventional] ideas, was right when he declared that reason was "the slave of the passions."

Questions:

1. According to the author, what is the relationship between reason and emotion?

2. What does the final line of the reading, “reason was ‘the slave of the passions” mean? Consider the meaning of that line in the context of the whole passage.