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DRIVEN TO LEAD

Good, Bad, and Misguided Leadership

Paul R. Lawrence

Foreword by Warren Bennis

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"This is an inspiring book, filled with excellent examples, valuable advice, and warnings not to be overlooked. Every executive would be well-served to read this book cover-to-cover."

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"Paul Lawrence tracks leadership qualities into the deepest recesses of the human brain. Listen up, business! Tapping into this scientific understanding of leadership is key to your company's success or failure."

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"Paul Lawrence proposes that nature has provided us with individuals of conscience who are capable of good leadership, but also with a small number of individuals whose lack of conscience typically makes them bad leaders. He refers to such individuals as free riders, psychopaths, or 'people without conscience,' and discusses in detail the devastating impact they have when placed in a leadership role, particularly in business, politics, the military, and religion. His thesis is brilliant and compelling, and in line with current research on the neuroscience of psychopathy. *Driven to Lead* is essential reading for anyone who hopes to gain some understanding of the scandals and disasters that result from bad leadership."

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—Excerpt from the Foreword by Edward O. Wilson

CHAPTER ONE

HOW MUCH CAN WE HOPE FOR?

It is not the strongest of the species that survive, nor the most intelligent. It is the one most adaptable to change.
— CHARLES DARWIN[1]

Helen's boss, Peter, has just informed her that her unit is going to be eliminated and that, while she and some of her employees will be offered jobs elsewhere in the company (and possibly elsewhere in the country), she will have to lay off the rest of her team. What's more, Peter doesn't want her to let anyone know yet because the company needs her team to finish its current project ahead of schedule. Peter has always looked out for Helen, and now he says he is counting on her to manage this with as little damage to the company as possible. "We're in enough trouble as it is," he confides, "or I wouldn't be asking you to do this." He doesn't say what the trouble is.

We can imagine that Helen has many conflicting motives. She wants to do her best for the company, or at least to live up to Peter's expectations and to repay his past generosity. She wants to come out of this looking good, to protect her own career. There are a few of her people she could afford to be rid of, but she is anxious to be fair. She'd very much like to know what has made this layoff necessary, but she is reluctant to ask Peter for more information than he chose to give. She doesn't feel right keeping the impending layoff secret from her team, yet she thinks that if

she lets the cat out of the bag now, it would be very difficult to finish the current project, never mind speeding it up. Not that her team would deliberately sabotage the project, but keeping them extra motivated while waiting to be laid off would take some very skillful management on her part, and she's not sure she's up to that.

Clearly, some of her impulses are contradictory. She can't let people know *and* keep it a secret at the same time—but there are good reasons for both. She can't lay off a long-time-but-not-very-useful employee *and* keep a new-but-harder-working employee while appearing completely fair—but there are good reasons for both. It ought to be a mental train wreck, and yet somehow she will come to a decision of an acceptable course of action. She will not go crazy. Her head will not explode.

GOOD LEADERSHIP IS A NATURAL HUMAN BEHAVIOR

The poet John Donne noted that many everyday occurrences would seem miraculous if they happened only once.[2] I think we can look at Helen's eventual decision as just such an occurrence. Forming a decision out of such a tangle of motivations would seem miraculous if it weren't something we all do regularly. In this book we will examine what makes human beings capable of this everyday miracle of leadership and how we can all make better and more consistent use of it.

If we saw a cow flying through the air, we would wonder how the cow did it. We don't usually wonder how a bird does it; we know a bird is designed to fly. What I want to show you in this book is that human beings are designed to feel simultaneous conflicting motivations and to arrive at an acceptable decision—not *in spite of* the conflicting motivations but *because of* them. It is the very tangle of Helen's motivations, we might say, that will enable her to solve them satisfactorily.

How can that be? All living things react to certain aspects of their environments, but no living thing can react in as many different ways to as many things as a human being can. There are several reasons for this, but the most important is the fact that

more things strike us as *significant* or worth reacting to. You might say that more things can push our buttons because we have more buttons to push. Four, to be precise—the four basic drives that I will discuss fully in Chapter Two. Other animals have a basic drive to get what they need—food, shelter, a mate, and so on—and a basic drive to defend themselves against whatever threats they can recognize. Humans of course have these two drives, but we have two others equally important to us—a basic drive to bond, to trust and care for others and to be trusted and cared for by others, and a basic drive to make some sense of our lives. While these two drives sound "fuzzier" than the other two, we will see in the next chapter that they are just as real. It is because we have four drives—four buttons to be pushed—rather than two that we are so much more responsive to our environment. As far as we know, no other creature could have so many different and conflicting things on its mind as Helen has on her mind in the story after hearing Peter's request.

But how does this responsiveness result in decisions and leadership rather than confusion and stalemate? It happens because our brains have evolved a way to let all four drives "have their say" and then to use our knowledge and experience to arrive at a solution that is acceptable to all four. This is not a metaphor; this is really what happens in the brain, as we will see in Chapter Two. And it is the need to accommodate such a variety of motivations—Helen's predicament—that brings forth such a variety of responses. To put it crudely, for most creatures, the only problems are to feed and mate and to fight or flee enemies. There are only so many ways they can do those few things, amazing as some of those ways may seem to us. (We are amazed that a spider can make a web, but that's about the only thing a spider can make.) Helen, though, has so many different impulses to take into account—so many more things that matter to her—that her solution cannot be the same thing that has already been done a million times.

She cannot just spin another web. She has to come up with a unique solution to an immediate situation. That is what humans are uniquely able to do, and that is a pretty good description of leadership. It is obvious from everyday life and from history that

this decision-making process is not perfect, but it is also obvious from everyday life and from history that it does work pretty well much of the time.

Often our motivations are conflicting because various people are involved who have different—even conflicting—needs and desires. (This is what Helen faces—the needs and desires of her team differ from the needs and desires of Peter and his superiors; her own needs and desires are yet another variable.) But human beings are designed to take other people's differing and conflicting needs and desires into account.

In short, we are designed to accomplish things in groups—to lead and follow (which, we will see, are not simple opposites), to learn from each other, to trust and protect and care for each other, to acquire what we need collectively even if we then enjoy it individually. We have evolved this way because it turned out to be a very successful means of survival.

And it still is. In the 1990s and early 2000s, a surprising transformation took place on two offshore oil rigs. Thanks to a deliberate management effort, an extremely macho culture that rewarded intimidation, recklessness, and a cocksure attitude, even when this resulted in injuries and deaths (not to mention inefficient oil drilling), changed into a culture in which these same tough men took their own and each other's safety seriously, asked for and accepted help from each other, and would even admit out loud in front of visiting women professors that they were afraid or unsure. As one worker put it, "We went from living in one world to living in a good world."[3] Meanwhile, the drilling was accomplished more efficiently and more profitably.

Here, leadership took the role formerly played by evolution. In fact, leadership has become our primary means of *adapting* to changing circumstances, which Darwin cited earlier as the key to our survival. Since circumstances are always changing, we all have to lead ourselves. In addition, many of us lead others or would like to. This is not a glib comparison; we will see in Part One that the leadership most fit for a group is an extension of the self-leadership that is built into a normal individual's brain. And as we will see in detail in Chapter Four, this was exactly the kind of leadership that altered the crews of the oil rigs.

IS BAD LEADERSHIP PART OF THE HUMAN CONDITION?

This book about good leadership will have a lot to say about bad leadership. Because humans survive and accomplish things in groups, and because groups always have leaders (often multiple leaders), a bad leader is a serious problem. Although bad leadership has always plagued mankind, we seem particularly aware now of political, business, and organizational failures all over the world—the financial meltdown on Wall Street, Bernie Madoff, the tolerance of child abuse in religious institutions, Osama bin Laden, the awful governments of Zimbabwe, North Korea, Sudan, Burma (Myanmar), and so on. Not only do we know much more about what leaders do and how they fail than would have been possible in previous times, we also expect better of them—a legacy of the Enlightenment. That is why it is so frustrating to see these bad leaders causing so much pain and suffering in so many people's lives.

Many people are understandably skeptical that leadership as a whole can be improved. Although it has been studied and written about for centuries, has there been any improvement in leadership comparable to the improvements in our material well-being brought about by science, engineering, and medicine? You may expect me to say "no," but actually my answer is, "Yes, but the advancements are too easily reversed." The U.S. Constitution, for example, can be seen as a social technology that has been as beneficial since its invention as inoculation or the electric light. (This is discussed at length in Chapter Five.) But we have not been able to nail down our advancements in leadership so that they stay put, the way the advances made by Jenner or Edison seem irreversible. There are always big steps backward.

Is bad leadership an inescapable part of the human condition? My response is that once we understand what makes for good leadership, we can see that the *potential* for bad leadership is indeed part of the human condition, but not the necessity of enduring it. Consider pneumonia: it used to be a deadly disease, but today it is rare for anyone in the developed world to die of pneumonia unless he or she is already weakened by age or chronic illness. Our "human condition" has not changed; we

have the same potential to die of pneumonia as ever. But it is no longer necessary for us to die of pneumonia because we finally understand it and know what do about it. I think we are now on the verge of understanding bad leadership and what to do about it.

LEADERSHIP IS DECISION MAKING, AND WE ARE DECISION MAKERS

Leadership is always associated with action. But to understand leadership and to practice better leadership, we will need to take a closer look at inaction. Think of all the things we don't do—all the things we want but don't buy (or steal), all the things we think but don't say, all the people we don't like but don't attack, all the choices we consider but don't take.

One way of looking at this is that, more than any other species, human beings are decision makers. Other animals make choices, but they do not choose from the infinite possibilities from which humans must choose. (At least, we don't see the variety in animal activity that we see in human activity.) How is it that, in any particular circumstance, we are capable of so many different responses and yet manage to choose one—usually a workable one? It is possible because we make our decisions in a unique way. We are certainly not the machines of "rational self-interest" that leading economic theories imagine we are (which should be obvious by the frequency with which we undermine ourselves). But there is a logic at work. While in some ways it is non-negotiable, it is fantastically flexible. As I said earlier, it is designed to arrive at good decisions because of—not in spite of—conflicting motivations. The process is certainly not foolproof, but it is well-designed for self-correction and improvement.

This decision-making process—so familiar yet so surprising when we really examine it—is the basis of good self-leadership and good leadership of groups. We will learn about it in Part One; that will be the first step in learning to lead with your whole brain.

This book is organized into three parts:

Part One, "The Leadership Brain," presents the biological underpinnings of leadership behavior.

Part Two discusses the history of leadership, examining critical turning points in the leadership of political institutions; the rise of corporations as the leading economic institution; and the leadership of religious, artistic, and scientific institutions.

Part Three focuses on modern (mostly twentieth-century) political and economic leadership. Chapter Eight is concerned with contemporary corporate leadership, including the contrasting leadership styles of firms such as Enron and Medtronic. Chapter Nine extends that discussion to the crisis of the 2007–2009 subprime mortgage financial meltdown. Chapter Ten moves to contemporary issues of multinational corporations and world-level political institutions. Chapter Eleven discusses the practice of good/moral leadership and ends with ideas for action on the high-priority issues of our time. Chapter Twelve provides a fresh look at the age-old question of the meaning of human life and the question of human progress.

PART ONE

THE LEADERSHIP BRAIN

CHAPTER TWO

A BRAIN DESIGNED FOR LEADERSHIP?

Man is a social animal endowed with reason.
— PARAPHRASED FROM ARISTOTLE

The small strength and speed of man, his want of natural weapons, etc., are more than counterbalanced by his intellectual powers through which he has formed himself weapons, tools, etc., and secondly by his social qualities which lead him to give and receive aid from his fellow-men.
— CHARLES DARWIN[1]

What is leadership? It is a particular kind of decision making—decisions a leader makes in guiding and motivating a group of people in responding to a particular set of circumstances. The circumstances may be immediate or they may be something the leader foresees in the future, but in either case, there are choices to be made.

This is unique to human beings. For example, bees do what seem to be very complex things, but they do not have leaders who decide among competing courses of action. A queen bee is not a leader; she does not devise solutions to problems and convince other bees to do what needs to be done.

The human brain is also unique in many ways, some of which are directly related to this uniquely human type of decision making. We will see that the human brain is specifically designed to solve problems that must be figured out rather than handled by

instinct, to solve problems facing a group, to solve problems through the efforts of a group, to consider multiple—even conflicting—impulses and options, and to arrive at pretty effective decisions. In the past two decades, new methods of neurological research have been showing us more and more (though we still need more) of what is actually going on in the brain when we react to our surroundings, consider choices, remember experiences, and make decisions. We are able to see certain parts of the brain "lighting up" while making certain kinds of decisions, and we are able to see people unable to make certain kinds of decisions when certain parts of the brain have been damaged. Many of these observations and results can be seen to build off of the basic insights of Darwin's about human nature as reflected in his quotation at the beginning of this chapter. They indicate that leadership is an expression of the survival mechanism, which human beings have evolved. In plain terms, leadership is what we as a species do well.

I am emphasizing the brain because that's literally where our capacity for leadership is lodged. When I speak of "leading with the brain," I don't just mean "using your head" or "being smart" in the ordinary sense; I mean, making full use of the structures in the brain that are specifically involved in—and have evolved for—leadership.

Every species on earth has, obviously, evolved to survive. Most species have evolved to survive by possessing and passing on to their offspring physical characteristics and instinctive behaviors, which give them a particular advantage in a particular environment. Within a limited range of circumstances, they can do exactly what it takes to survive. In most cases, each individual can do exactly what it takes *by itself* to survive. Humans have evolved to survive in a completely different way—by working together and by relying more on problem-solving skills than on instincts. This is a pretty good working definition of leadership. This unique way of surviving involves solving new problems as they arise and solving a wide variety of problems in a wide variety of ways. These are normally considered characteristic of good leadership.

Helen's response to her situation, for example, would differ if any of a number of circumstances differed; if she did not feel loyal to her boss, if her team were not halfway through a key project,

if she had a great job offer somewhere else, or if she herself had ever been laid off unexpectedly. No set of instincts could cover such a variety of circumstances. What Helen has instead is a brain designed to weigh her need to make a living, her need to avoid the anger and hostility of others, her need to trust others and be trusted by them, her desire not to hurt others, and her need to figure out what to do rather than letting events overwhelm her—and to come up with a solution to this particular set of circumstances.

People do have instincts, but they account directly for only a fraction of our actions. What is built into us is not *what* we will do in a particular situation, but *how* we will decide what to do. It is because we generally rely on a decision-making process rather than on instincts that we have both the need and the capacity for leadership. It could even be said that, for humans, decision making and leadership have replaced the earlier, simpler processes of biological survival.

DESCRIPTION OF THE DECISION-MAKING PROCESS IN ACTION

People don't necessarily see, hear, smell, taste, and feel more than other creatures, but we do react to much more of what our senses tell us than any other species. We make use of this flood of information by filtering it, so to speak, through a set of four priorities, which I call our "drives."[2] We have these particular four drives because, taken together, they constitute a very successful survival mechanism. (How this evolved will be explained in Chapter Three.) These criteria are not learned, they are innate—we are born with them. They are unconscious, although, as I will explain further on, we are conscious of the emotions that they generate.

A drive is not simply an imperative. We do not have a constant signal in our brain telling us to "eat, eat, eat." What we have are criteria by which we judge our circumstances. For example, in order to survive, I need enough food. Will this particular circumstance help me get enough food, or might it prevent me from getting enough food, or does it have no bearing at all on my getting enough food?

Two of these drives, or criteria, are the obvious drives any animal species must have in order to survive as a species:

- The drive to *acquire* what one needs for one's survival and the conception and survival of one's offspring;
- The drive to *defend* oneself and, as needed, one's offspring from threats.

The other two drives, or criteria, are unique to human beings (note Darwin's quote earlier):

- The drive to *bond;* that is, to form long-term, mutually caring and trusting relationships with other people;
- The drive to *comprehend;* that is, to learn, to create, to innovate, and to make sense of the world and of oneself.

To say that we have these four drives means that these are the criteria by which our brain's decision-making mechanism evaluates the circumstances it faces and, as we will see further on in this chapter, by which it evaluates possible responses in order to choose the "best available." Put another way, these are the criteria by which well-adjusted people lead themselves and by which good leaders lead others. This means that good leadership is rooted in the inherent workings of a very successful survival mechanism, which makes me very hopeful.[3]

Now, of course, we'd like to turn back to Helen and see if the four drives tell us anything useful about her situation and what she's going to do about it. But first, I need to say a little more about the drives themselves. The addition to the first two of the drive to bond and the drive to comprehend makes all the difference between human and nonhuman, between leadership and mere dominance of a pack:

- These two drives are not frosting on the cake. They are as much a part of our way of surviving as the other two. While other species survive by feeding, mating, fighting, and fleeing, our species survives by feeding, mating, fighting, fleeing, *befriending,* and *figuring out.* This means that, in any situation, we have many more factors to take into account. We could see that in Chapter One with the list of things Helen would have on her mind as she tries to decide what to do. But the fact that everything is so much more complicated for humans than it is for bees or horses is what makes us so versatile and why we can do so much more than just survive. Being a leader is much more complicated than being a queen bee, but (as far as I can tell) much more rewarding.
- These two drives make us able to work in cooperative groups according to the needs of a particular situation rather than relying on instinct as social insects and schools of fish must do. These are the drives that make leadership, as opposed to sheer dominance, possible and necessary. As Darwin noted, we were never the strongest or fastest species, but we work together more effectively under more different circumstances than any other species, as many a harpooned whale could attest.
- These two drives make us able to survive mostly by figuring out what to do rather than relying entirely on instinct. But whereas any member of a particular species has the same instincts, humans do not all have the same problem-solving capabilities. There are innumerable different kinds of knowledge and ability, not to mention inherent differences in intelligence. We cannot instinctively take on the roles of drones and worker bees; at all levels we need to lead and be led.
- These two drives enormously expand the meaning of the first two drives. (Which is why the brief descriptions earlier may not have seemed very applicable to actual leadership.) Because we have a drive to bond and a drive to comprehend, the human drive to acquire goes far beyond the drive to acquire food, water, warmth, and a mate. For example, we have a drive to acquire things which interest us or which give us a sense of who we are or which would please other people whom we care about—even future generations. The drive to defend goes far beyond the drive to remain alive and well. We have a drive to defend groups to which we belong, even when there is no direct threat to ourselves. We have a drive to defend ideas and beliefs. We have a drive to defend our pride and hope and self-image as well as our physical well-being. We have a drive to protect strangers and future generations from danger and harm—that's why we fill in potholes and build hospitals.

Having four drives, or four criteria for evaluating our circumstances, opens up enormous possibilities. It's like judging a figure skating routine as opposed to judging a shot-put event. For the latter, there is only one criterion—distance. There can be little doubt about who won. For the former, there are multiple criteria, such as form, difficulty, errors, and beauty. This creates a problem for the judges, but it creates opportunity for the skaters.

It is obvious that the drives can conflict with each other. Indeed, the observant among us have always known that humans are a mysterious bundle of drives which often conflict with each other inside our heads. As the poet Stevie Smith wrote:

> Only human beings feel like this,
> It is because they are so mixed.[4]

Helen's desire to further her career by carrying out her boss's wishes, an expression of her drive to acquire, conflicts with her desire to be honest and compassionate with her subordinates, an expression of her drive to bond. Her desire to know what trouble the company is in, an expression of her drive to comprehend, conflicts with her fear of aggravating Peter by pushing him for an answer, an expression of her drive to defend.

How is it, then, that these four drives—these four different criteria for judging the same situation—can constitute a successful survival mechanism? How can they produce anything but discord and stalemate? How can they add up to leadership? If an Olympic figure skating event were judged by one Form Judge, one Difficulty Judge, one Error Judge, and one Beauty Judge, there would be many a standoff. Instead, each judge has to weigh all the criteria, and as we will see, that's what the brain does, too.

The drives are something like four lobbyists meeting with a senator, each alert to a certain category of what matters and making sure the senator takes that priority into account. Imagine a meeting in the senator's office before a vote on a climate change bill. One lobbyist is insisting that reducing greenhouse gas emissions as quickly as possible is the single goal. One is insisting that economic growth matters. One is insisting that

good relations with China matter. One is insisting that scientific certainty matters.

The senator profits from hearing all four of these points of view. For one thing, all these concerns really do matter. A country that poisons the air can't survive. A country that lets its economy stagnate will be weak. A country that can't get along with China is vulnerable. A country that embraces scientific fallacies will be in error. On the other hand, each point of view would bring disaster if it were the only one taken into account. A country whose only priority was clean air would revert to the Stone Age. A country whose only priority was economic growth would create environmental havoc. A country whose only priority was appeasing China would become a vassal state. A country whose only priority was scientific certainty would be unable to act on most of the issues it faced. Only when all four priorities are evenly matched can they provide the basis for a sound decision.

But that is all they can do—provide the criteria for choice. It is the senator who must weigh these conflicting demands and make a decision that does as much good and as little harm as possible. In the same way, our drives are alert for what matters according to their particular criteria. They provide a foundation for a sound decision, but a different part of the brain has to come up with multiple options and propose the "best" decision. As we will see, there is a part of the brain (the prefrontal cortex) that does exactly that. (Which, of course, is why a senator or an Olympic judge or Helen can do it.)

I pointed out in Chapter One that we can make good decisions not *in spite of* conflicting impulses but *because of* them. Our four drives give our brain a picture of the world that is much more complete—multifaceted rather than one-sided—than it could be with only the two animal drives to acquire and defend. This four-drive picture can be complex and perhaps conflicted and confusing, but it has also been underlined and highlighted, so to speak, in terms of what we human beings need to survive (sustenance, safety, community, and understanding). Put another way, it is not only a snapshot of what's going on, it is also a blueprint for deciding what to do—a blueprint for leadership.

EVIDENCE OF THE DECISION-MAKING PROCESS

Many descriptions of human behavior have an imaginary "as if" quality. No one has ever been able to hold up an X-ray or an MRI scan and point to guilt, pride, patriotism, or a soul, but we often behave *as if* we had what is meant by those words. I believe that this book's description of leadership is different. In the following description, I will point out research findings which indicate that the four drives I have described and the decision-making process that they set in motion are not imaginary "as if" concepts; they are what is actually happening in the brain.

This is why I think we are finally on the verge of putting leadership on a scientific basis, as we have already done with healing. Science has not yet given us the cure for everything, nor can it yet explain the observed healing powers of acupuncture or love or true grit. But I hope there is no argument that science has made the overall human effort to heal the sick and injured much more successful, and I believe science can now begin to have the same beneficial effect on leadership.

THE DRIVE TO ACQUIRE (DA)

Humans, in common with all animals, have a fundamental drive to get what they need to stay alive and have progeny: food, water, warmth, sex, and so on. This is the easiest drive to understand and, needless to say, it lies behind something almost everyone has to do—work to make a living. While there are other animal species that "make their living" by group efforts, each has evolved a particular way of doing so which suits its particular environment. Humans, on the other hand, have evolved the capacity to make their collective living in a fantastic variety of ways and environments. Put another way, bees have evolved to make honey together but humans have evolved to "make do" together. Making honey together can be done by instinct; "making do" together requires leadership.

Modern neuroscience provides evidence to support the biological basis of the drive to acquire. Brain imaging studies conducted by Becerra have identified a module called the nucleus

acumbens—in the limbic area, close to the front of the middle brain—which lights up with increased blood flow when people and animals experience pleasurable sensations from objects they acquire, ranging from tasty food to the sight of a beautiful face.[5] We will see that the limbic area of the brain seems to be the home of the unconscious part of the mind, including all four drives.

Because tangible goods tend to be "scarce"—that is, there is only so much available—the drive to acquire often provokes competition. The obviousness of this effect and the fact that it can be expressed in mathematical models such as supply-and-demand curves has led to the dominance in the academic and policymaking worlds of the neoclassical economic model, which takes man to be exclusively motivated to acquire scarce goods in order to maximize his own rational self-interest.[6]

THE DRIVE TO DEFEND (DD)

For most species, the drive to defend is a sort of mirror image of the drive to acquire. What needs defending is what needed acquiring—food, water, warmth, mates, and so on, along with life itself (which, strictly speaking, was never "acquired"). For humans, with their four drives, the drive to defend covers much more ground—not only the physical necessities of life and procreation but also our relationships, our cooperative efforts, and our understanding of the world—the necessities required by our drives to bond and to comprehend. As with the drive to acquire, humans satisfy their drive to defend in a huge variety of ways and generally in cooperation with others.

The drive to defend seems, like the other drives, to be housed in the limbic area of the brain, specifically in a module called the amygdala. Depending on what part of the amygdala is stimulated, the response will be appeasement, flight, or aggression.[7]

THE DRIVE TO BOND (DB) AND THE INDEPENDENCE OF THE DRIVES

> There is no reason why [man] should not have retained from an extremely remote period some degree of instinctive love and sympathy for his fellows.... It is almost certain that he would

> inherit a tendency to be faithful to his comrades . . . be willing to defend his fellow-men; and would be ready to aid them in any way which did not too greatly interfere with his own welfare or his own strong desires.
>
> **Charles Darwin**[8]

The existence of the drive to acquire and the drive to defend seems incontrovertible—how could any species survive without them? But the existence of a drive to bond—to seek social bonds, ties, attachments, and commitments—on equal footing with the others is more controversial, and I will devote more space to providing evidence for it.

Of course, there is nothing new in the observation that people tend to form bonds with other people. We see it in the bond between a couple (married or not), the bond between parents and children, the strength of family ties, the power of patriotism and other kinds of group loyalty, the power of social structures and cultural symbols, and the universal presence in humans of some kind of moral sense regarding social relations. Without this fundamental human behavior, there could be no such thing as companies or any other kinds of organization. Even the most inhumane dictator or business tycoon depends on a certain amount of unforced human cooperation amongst underlings; after all, he or she cannot hold a gun to everyone's head.

But we need now to look at this utterly familiar phenomenon in a new way, not simply as "the way people are" or as "the innate goodness in people," but as one of four survival-oriented criteria by which the brain evaluates what is going on and what should be done about it.

The drive to bond forces us to address an important characteristic of the four drives: they are *independent.* A drive cannot be satisfied by the satisfaction of one or even all three of the other drives. This is a subtle point to which we will return throughout the book because it determines how the brain's decision-making process finally decides and is therefore a key to good leadership. The independence of the drives can be disguised by the fact that they can assist each other. There is no doubt that the drive to have friendly relations with one's fellows can be helpful in acquiring the necessities of life and in keeping safe. What is characteristic

of humans is that the drive to have friendly relations persists even when one's needs are fully met and even when the drive works contrary to one's own material interests. For example, a simple thought experiment suggests that the drive to bond is an independent drive, not a tool for satisfying the drives to acquire and defend. Imagine being in solitary confinement, yet provided with every physical need and physical comfort you could want. Even sex, but with someone who simply appears and has sex with you whenever you want it but never speaks or stays. Would that really do? Wouldn't you still be lonely?

Closer to home, we can see that all Helen needs to "survive"—to keep making a living—is to carry out her boss's request. As far as her drive to acquire and her drive to defend are concerned, she doesn't *need* to worry about being fair to her employees, about hurting anyone's feelings, about finding out what's really going on with the company, or about facing herself in the mirror. And yet, she does need to worry about these things, and so would most of us. And I use the word *need* deliberately. It's not just that she does worry about them; she *needs* to worry about them because the drive to bond (and the drive to comprehend, which we will get to shortly) are equal components of her four-drive survival mechanism. Her brain is not simply bent on survival; it is bent on survival by figuring out her situation and coming up with a solution for the group of which she is a part.

The key indicator that the drives are independent is that all four seem to have their own biochemical reward systems in the brain. Becerra's finding dealing with the nucleus acumbens deals with the drive to acquire. We can also observe that we are rewarded with pleasure for having sex, even though the part that would seem most pertinent to species survival—childbirth—comes much later. But since sexual intercourse is the only part of the process that is voluntary—the rest takes care of itself—evolution would favor the genes of individuals most likely to do it. Individuals whose nervous systems rewarded them for sex with a rush of pleasure (that is, for whom the drive to acquire came with its own built-in biochemical reward) had a survival advantage, which became a characteristic of our species.[9]

The drive to defend also has its own biochemical reward system. For example, most of us would take a real risk to save the

life of a lifelong friend. Their overwhelming gratitude would be immediately rewarding; it would feel wonderful. This is a survival mechanism; the fact that I feel good having saved a friend's life encourages me to continue to behave that way which, in turn, increases the chances that someone might someday save my life.

This also seems to be the case for the drive to bond. Researchers at the National Institutes of Health scanned the brains of volunteers who had been asked to think about either donating a sum of money to charity or keeping it for themselves. When a volunteer thought about donating the money, a section of the limbic area of his or her brain lit up. This also, surprisingly, was the nucleus acumbens, which usually lights up in response to food or sex. The experiment indicates that acts of generous bonding are neither a superior moral faculty that suppresses the more fundamental urge for self-preservation nor a useful "tool" of the drive to acquire, but a full-fledged drive in its own right, hard-wired into the brain And the brain is even wired to provide the reward of a pleasurable feeling in much the same way that it does for food and sex.[10] As ancient wisdom would have it, "virtue is its own reward." As science would now put it, humans have a drive to bond which is independent, not simply a means to the ends of acquiring and defending our needs.

A number of experiments have offered evidence that there is a drive to bond in the brain:

- When certain parts of the limbic area—the hypothalamus and anterior thalamus—are impaired, individuals have a difficult time forming any meaningful or stable social relationships.[11]
- "Minimal group" experiments—in which a group of strangers is divided into arbitrary subgroups—have shown how easily individuals form surprisingly strong attachments to members of the same group, even if the group is completely meaningless and has no prior history together.[12]
- Human infants between eighteen and twenty-four months old show a spontaneous—that is, unrewarded—impulse to help others when they are far too young to have learned this behavior from adults.[13] Experimenters, who were strangers to the toddlers, did things such as accidentally dropping a clothespin on the floor and unsuccessfully reaching for it. The children retrieved the clothespin for the experimenter 89 percent of the time.[14]
- As far as we know, all humans, except the rare psychopath, experience pain at the loss of an important long-term relationship, whether by death, divorce, emigration, downsizing, or many other causes. In many cases, this pain cannot be explained by reference only to the drives to acquire and defend. Emigration to the United States from a mother country in which one is not only doomed to poverty but also subject to violent persecution is, rationally speaking, a net gain in terms of maximizing self-interest, yet it will still cause deep and lasting grief.
- A particularly interesting piece of physical evidence for the human drive to bond is the whites of our eyes. The only three primates known to have whites of the eyes that can be easily seen are humans and two rare species of South American monkeys, marmosets and mariqui monkeys. Michael Tomasello, a neuroscientist, has noted that the whites of the human eyes make it easier to tell what a human is thinking. That would be advantageous only if one can safely assume that one's fellows are driven to be helpful and friendly. This is generally true of humans, but not of chimps. But why do marmosets and mariqui monkeys also have whites to their eyes? It also turns out that, along with humans, they are among the very few primates that are monogamous. The fathers seem to do roughly half the work of raising their progeny. Do these South American monkeys have exactly the same drive to bond that humans have? Probably not, but we can speculate that monogamy and communicative eyes with whites have evolved together. Bonded couples of any primate species must find such eyes helpful for close collaborative work.

I will bring up one more very revealing experiment with chimpanzees. This provides only indirect—but to me, strong—evidence of the existence of the drive to bond in humans through its sharp contrast with the lack of such a drive in chimpanzees.

Researchers hid food in one of two containers, then let a chimpanzee pick one, but only after giving the chimp what to us would have been an obvious hint, such as looking at one of the containers or tapping it or placing a marker on it. The chimps consistently picked the *other* container. A few chimps eventually

caught on, but it took dozens of tries. Because these chimpanzees had performed very well on other tests, the researchers wondered why they were "so dumb" on this one.[15]

I would say that it was because chimps simply do not have a drive to bond. While adult chimps have many social interactions, these appear to be entirely opportunistic—more like a means to fulfilling the drive to acquire. (The exception being the mutual love between mother chimps and their infants.) It simply wouldn't occur to a chimp that someone else—chimp or human—was trying to be helpful just to be helpful. Instead, the chimp would understand that this experiment was a competitive two-person game. "If I don't guess the right container, that experimenter will get the food. The smart thing to do, then, is the opposite of what that tricky experimenter is signaling."

On the other hand, the human experimenters do have the drive to bond and this, I believe, is what blinded them to the chimpanzees' motives. While we have all, at one time or another, been deceived or betrayed, most of us find it almost impossible to imagine someone who is consistently distrustful and deceitful. Because the drive to survive jointly is built into our brains, it doesn't occur to us that something as human-seeming as a chimpanzee has no such drive to survive jointly. (We will return to this point later in regard to the behavior of human beings, particularly leaders, who actually do lack the drive to bond and whose behavior the rest of us tend to find incomprehensible and even unimaginable.)

THE DRIVE TO COMPREHEND (DC)

> As soon as the important faculties of the imagination, wonder, and curiosity, together with some power of reasoning, had become partially developed, man would naturally crave to understand what was passing around him, and could have vaguely speculated on his own existence.
>
> **Charles Darwin**[16]

Humans have a fundamental drive to understand themselves and their environment. It can also be thought of as a need to

understand how things work. Like the drive to bond, this drive is often clearly in the service of the drives to acquire and defend. For that matter, the drive to comprehend is often in the service of the drive to bond because cooperating—or just getting along—with others can be quite complicated. Nevertheless, it is an independent drive, not simply a tool used by the other drives, as can be seen clearly in the curiosity of children, who ask questions without knowing whether the answers will ever be of any use to them in fulfilling the other drives. Children can also be seen testing our answers to see if they are consistent with what else they know. Even newborns, when they are well fed and securely loved, can be seen exploring their environment with their eyes and their hands. Another strong indicator is the fact that anthropologists seem not to have found a single culture that does not have a creation story and few that do not have an afterlife story. People seem to need these theories to give meaning to their lives, regardless of whether or not the stories confer any advantage in acquiring, bonding, and defending. I argue that religions arose in all societies primarily to help fulfill this drive.

The need for dignity, mastery, self-esteem, or self-actualization[17] is a manifestation of the drive to comprehend—we need to make sense of ourselves as well as make sense of the world. Business leaders sometimes look askance at these "needs," as if they were being told that their employees need to be given milk and cookies and told a story or the company will not be competitive. In fact, the need for mastery or self-actualization is one form of an innate biological drive which, though not as immediately urgent as the need for oxygen, is in the long run just as much a determinant of how people will act.

A remarkable new finding provides empirical evidence of the physical existence of the drive to comprehend. It demonstrates the independence of this drive, and even locates it in the brain. Irving Biederman, of the University of Southern California, found that a part of the brain that helps you recognize what you see seems to be equipped with its own reward system of opiate receptors, which give a pleasurable "high" when they are stimulated by "catching on" to some novel event. He also found that this pleasure response diminished when the same image was recognized repeatedly. As Biederman sees it, these opiate receptors get bored

by repetition and thus are freed up to be stimulated again by something new and unrecognized. In short, we are rewarded directly with pleasure for learning something new. Comprehending is independently rewarding, time and again, and only secondarily does this make us more competitive than a species that does not keep learning.[18]

The independence of the drive to comprehend is also seen in the fact that humans tend to think about and figure out all kinds of things that only later, if ever, prove useful for survival. This might seem wasteful, but it has proven to be a valuable key to survival. Humans generally survive by figuring things out rather than by instinct, and the drive to gather up and store information and insights whenever possible makes it much likelier that one will have the knowledge needed for some future situation. Put another way, intellectual scavenging and hoarding is a good survival technique, essential for adaptive leadership.

The drive to comprehend is a cornerstone of leadership in a second way. To lead a group, the leader must impart or maintain some kind of shared understanding. "Our job is to give the customers a good first impression." "We're all in this together." "We're screwed if we don't get the error rate down." "This is the most efficient way to do the job." Shared understandings, along with bonded relationships, are what hold groups together. Groups must therefore learn (that is, improve their understanding) together or suffer the consequences.[19] The auto industry is, currently, one of many facing precisely this challenge. Both management and unions have formed understandings of themselves and each other which no longer correspond well enough to reality to help them succeed.

Before moving on, I would point out that the definition from Aristotle at the beginning of this chapter would translate into four-drive terms as follows: Humans are social (dB) animals (dA and dD) endowed with reason (dC). What an amazingly compact definition of an exceedingly complex subject.

THE ROLE OF EMOTIONS

I have been speaking of the drives as parts of the survival mechanism which our species has evolved—as every species, obviously,

must, in some way, if it is not to become extinct. Yet we all sense that our decisions and our leadership are often founded at least partly on something other than our own personal survival or our own best interests. This often puzzles us as individuals pondering our own or other people's behavior. And it certainly poses a challenge for leaders. Why don't workers always follow safety procedures designed to save them from injury? Why won't voters support regulation that would benefit most of them? Why aren't more people buying the product that's easier to use? Why are people willing to be led by a convicted embezzler?

The usual answer is "emotions," which are typically seen as rogue forces, separate from—and sometimes even in opposition to—rational self-interest. They are proving to be something much stronger and more useful. This discovery began when Antonio Damasio, a neurologist who has specialized in patients with significant brain damage, was working with a patient, a portion of whose brain had been "ravaged" by neurological disease. The man had what one would consider all the prerequisites of rational decision making—knowledge, attention, memory, language skill, ability to perform calculations and follow abstract logic—yet his daily life was "a succession of mistakes, a perpetual violation of what would be considered socially appropriate and personally advantageous." Damasio noted one other change: "a marked alteration of the ability to experience feelings." Somehow, this specific brain lesion had caused both a lack of emotions and an inability to reason properly in everyday life. "This correlation suggested to me that feeling was an integral component of the machinery of reason."[20] Damasio followed up this clue with two decades of clinical and experimental work with a large number of neurological patients. The following account of the role of emotions in the human decision-making process is largely based on his work.

The emotions seem to be the way our four unconscious drives—that is, basic components of our well-established survival mechanism—do their lobbying. It is how they make their priorities known to the part of the brain that will generate multiple options. They then make a contribution to the eventual decision. Presented with a particular set of circumstances, the four drives each evaluate, *according to their own criteria,* whether this situation—or some aspect of it—poses a threat, offers an opportunity, or simply doesn't

matter. If the situation is either a threat or an opportunity *in terms of a particular drive,* that drive attaches an emotional marker (some kind of a neurotransmitter) to the signal (the sensory input) as it passes through the limbic area of the brain and moves on to the prefrontal cortex, the conscious part of the brain. This means, of course, that a signal may emerge with more than one emotional marker.

Now think again of Helen. All four of her drives will attach emotional markers to the sensory input of her boss's request. Her drive to acquire sees that this is a chance for her to enhance her career, or at least to preserve her job. At the same time, her drive to defend is alert to the threat of losing her job, either through failure on her current assignment or in further layoffs. Her drive to bond is going berserk with the opportunities to enhance or poison her relationship with her boss and also her relationships with her subordinates. Her drive to comprehend is worried that she doesn't know the whole story. We, like Helen, are almost always awash in these emotional markers that give certain sensory impressions *meaning;* that is, which mark them off as something we *might* need to do something about. (I say "might" because the final decision making is still to come.)

This portrayal may sound a bit absurd, as if the brain were plastered with Post-it® notes. Nevertheless, there is experimental evidence that something like this is actually happening in the brain. Research on this phenomenon has been pioneered by Damasio. As is often the case with brain research, the importance of some part or function of the brain can be revealed—or at least suggested—by the unhappy consequences of its absence. Damasio reports the case of a man who had had a tumor removed from the ventromedial module of his prefrontal cortex. All seemed to have gone well at first, but then the man began to exhibit very strange and utterly debilitating behavior. He couldn't make up his mind about the simplest things, such as which pen to use to sign a paper. Damasio found that the man had no response at all to a set of photographs that would elicit physiological responses from any normal person—a naked woman, a bloody corpse, and so on. Something—presumably either the tumor or the surgery to remove it—had cut off both this man's ability to attach feelings to what he saw with his eyes and his ability to come to a decision. He could mull over the information perfectly

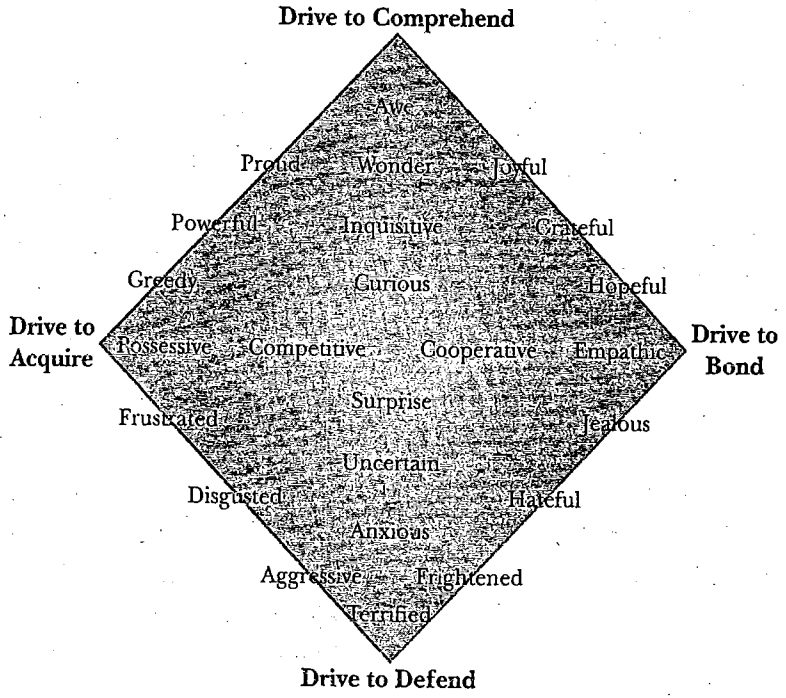
logically—this pen versus that pen—but it seems that no piece of information had enough "meaning" attached to it to force a decision.

I said earlier that the drives present our decision-making mechanism with a rich and complex picture of what's going on—sometimes so rich and complex as to be confusing and contradictory—but that this picture has also been helpfully underlined and highlighted. It appears that our emotions are the underlining and highlighting that say, "Here is what you really need to pay attention to. This is what's going to be on the exam." Or in Damasio's terms, our everyday reasoning cannot operate on pure facts. It needs to be powered by a purpose; the unconscious drives are our purposes.

Figure 2.1 arranges a number of emotions with respect to the underlying drive they represent. Obviously this arrangement is both crude and arbitrary. Words are somewhat clumsy symbols for the variety of human emotions. The important point is the variety of emotional information that is available to us about the leadership process going on in our heads, if only we know how to recognize and interpret it. And I would emphasize, emotions are apt to lead us astray *only* if we respond impulsively to just one emotion. Wise judgments are built out of taking account of all the emotional markers triggered by the situation at hand. Can Helen afford to ignore any of the emotions triggered by her situation?

Damasio's findings contradict the commonly held view that emotions are carryovers from early evolutionary history, useful long ago but now more likely to be an impediment than an aid to survival and success. I, too, strongly disagree with this view. I believe the emotions are essential information. For leaders, they can be appreciated as the visible tips of mostly hidden icebergs (the drives), enabling a skillful navigator to steer a safe and productive course. The fact that emotional promptings are not always logical is beside the point. We have evolved to survive by a combination of four independent drives, only one of which—the drive to comprehend—motivates us to be logical for logic's own sake. Pascal's famous statement—"The heart has reasons which reason does not know"[21]—was more scientifically accurate than he could have imagined.

FIGURE 2.1. EMOTIONS ARRAYED ON A FOUR-DRIVE QUADRANGLE.



HELEN MAKES HER DECISION

We left Helen with Peter's request passing through her limbic area, the four drives each signaling their concern (or concerns) by means of emotional markers. In some cases, the chance to satisfy one drive is clearly an obstacle to satisfying another drive. At first, she considers doing what Peter has asked her to do—leading her team to finish its project but not telling them that the axe is about to fall, so as not to destroy their motivation. Of course, she doesn't like the idea of pulling a trick on her team, with most of whom she has had very friendly relationships, but she knows that keeping quiet about imminent layoffs is a pretty standard business practice. She's known people who've been on both ends of it and, of course, she has read about it in the papers. Whenever she heard or read about such events, she always

hoped she would never have to do such a thing herself, and now here she was.

She wondered how she might be able to work behind the scenes to save her employees' jobs, or at least secure jobs for them elsewhere in the company, so that when the project was done, she could have something more honorable to tell them. But it seemed pretty likely that any such effort on her part would get back to Peter and he would feel she was scheming behind his back. *Then, for Heaven's sake, why not just ask him outright?* she wondered. *Why didn't I think of that in the first place?*

She began to imagine what she would say to him: "I'm going to do what you've asked me to do, but I have to tell you that these are great people. Of course I don't want to lay any of them off, but I also would hate to see the company lose them. Finishing this project ahead of schedule—which I know they can do—will have made them that much more valuable a team, something the company shouldn't lose." She liked the touch of emphasizing that *they* could do it rather than that *she* could do it; she was pretty safe and the point was to save them.

Uh oh. What if the company is about to drop that whole line of work? Her heart sank when she thought of that. Was it possible? She needed to know more about what trouble the company was in and what strategy it was hoping would keep it alive. Peter had done so much over the years to support her, but he had never been one to spill the beans about what top management was up to. *I guess I should admire that, but right now it seems more unfair than admirable.* How could she find out more? Get in touch with an industry analyst? Contact a headhunter and pretend she was looking for a new position? No, too dangerous. She had no gift for deception and subterfuge. One reason she was so loyal to Peter was that, early in her career, he had caught her out at a rather naive attempt and simply advised her not to take that route in life, even if she saw others succeeding at it.

No, anything behind Peter's back was out of the question. Better to ask him something outright and trust that, if he didn't approve, he would impart a lesson without holding a grudge.

She realized she was thinking more about her long relationship with Peter and not about her own people who needed her help, even if they didn't know it yet. A little to her surprise, she felt a

wave of tenderness for them. For the most part, they'd had a great time working together and had a lot to be proud of. Even the least efficient of them were likeable teammates. She would hate to lose this bond; even if most of the team survived a layoff, the feeling might never be the same.

Helen decided what to do. First she had a heart-to-heart with her group. Then she told Peter what she had done. "I talked to my group about the urgent need to get our project finished ahead of time in good form. They are all fired up to do it. I am confident we can. But I did this in a way you might not approve. I told them, in confidence, simply that the company was going through a rough patch and that there might be some layoffs coming our way. I told them our best bet for avoiding layoffs is our performing fast and great on our project. While I can't guarantee we will avoid layoffs, if they come our way, I promise to do my very best in helping anybody involved to find a good job elsewhere in the company or, if needed, outside. Now the group is really digging in and working hard. They are good people. You should know I intend to keep my promise to these people."

Helen could not tell for sure how Peter took her story but he didn't explode.

She could still feel anxiety in her body, but she did feel good about what she had done.

THE PREFRONTAL CORTEX

Now let's follow Helen's decision-making process from the inside.

The emotionally marked signals—the collection of concerns registered by the four drives—move from the limbic area, the home of the drives, into another region of the brain: the prefrontal cortex.[22] Neuropsychologist Elkhonon Goldberg gives us this dramatic assessment of the role of the prefrontal cortex (which he refers to as the frontal lobes):

> The frontal lobes perform the most advanced and complex functions in all of the brain, the so-called executive functions. They are linked to intentionality, purposefulness, and complex decision-making. They reach significant development only in man; arguably, they make us human.... The frontal lobes are the brain's command post.... Motivation, drive, foresight, and clear vision of one's goals are central to success in any walk of life.... [A]ll these prerequisites of success are controlled by the frontal lobes.... Damage to the frontal lobes produces debilitating blindness in judgment.[23]

A gross indication (not a proof in itself) that our humanity is significantly defined by the unique decision-making process carried out by the prefrontal cortex is the following trio of facts:

- The prefrontal cortex has been clearly identified as the place where decision making happens, at least the sort of complex conscious decision making characteristic of humans.[24]
- The prefrontal cortex is the most recently evolved portion of the human brain.
- The prefrontal cortex accounts for 29 percent of the total cortex in humans, as opposed to 17 percent in chimpanzees, 11 percent in gibbons, 8 percent in lemurs, 7 percent in dogs, and 3.5 percent in cats.

These three facts certainly suggest that the evolution of the prefrontal cortex has something to do with our unique ability to absorb such a wide range of information and take such a wide range of actions in response to it. It enables our unique form of leadership.

Many factors come into play simultaneously during this decision-making process, so I will begin with a quick overview of what happens, which can be summarized by the formula *impulse/check/balance.* When conflicting *impulses* arrive in the prefrontal cortex, they can *check* or block one another. At this point, there is a stalemate, but it is a most productive one. The prefrontal cortex calls on a storehouse of knowledge and know-how, located in a different region of the brain, the neocortex, to help it devise a solution—that is, a course of action—which integrates and *balances* the impulses. The prefrontal cortex feeds its integrated and balanced proposal back down to the drives in the limbic area for testing. They react, by means of emotional markers, much as they did to the original sensory input. This feedback loop continues, with proposed solutions passing up and down between the prefrontal cortex and the limbic area until the prefrontal cortex devises a solution which *satisfices* all four of

the drives.[25] This choice is sent on to the motor cortex, which sends instructions to the body for speech and action.

In one sense, we all know this is what happens in our heads when we have to make a decision and find ourselves "of two minds" (or more). What is new here is that I am proposing the physical mechanism by which it happens. Of course, I cannot offer a precise blueprint—too much about the workings of the brain is still unknown and I am not even an expert on what is known. But I think enough is known to map out the basic process and to enhance our ability to lead ourselves, our businesses, and our countries.

CONFLICT DETECTOR

The prefrontal cortex itself consists of a number of modules. The first stop for the incoming signals, laden with their emotional markers from the drives in the limbic area, is the ventromedial module, which responds to incoming signals that have conflicting emotional markers. This is where conflicting drives have a chance to check each other. For the moment, there is a stalemate, but it is that very stalemate that allows the prefrontal cortex to work out a mutually satisfactory solution, like a negotiator calling a ceasefire so that one side doesn't just overwhelm the other.

Without this ability to keep a number of impulses in abeyance until a final evaluation is made, we would not be capable of such varied responses to our circumstances. A shark coming upon a helpless victim can only make one decision. The manager of a failing employee can make many decisions. He can fire the employee, chew him out privately, chew him out publicly, give him another warning, try to help him improve, try to arrange training for him, try to transfer him, try to convince him to quit. The manager can even plan a sequence of responses: "I'll have a talk and give him one more month. *If* he shows some improvement..."

Helen, of course, does not just rush off and obey whatever her first powerful emotional impulse happens to be. We take that to be the natural behavior of a mature adult. It is, but it is thanks to her prefrontal cortex.

In order to consider alternatives, however, our brains have to be able to think them up in the first place and then keep a number of them "in mind" simultaneously. We are still far from knowing how the human brain thinks things up. But we do have some idea what resources it uses and where it stores the ideas it does think up.

TREASURES OF THE NEOCORTEX

One reason Helen can have as much on her mind as she does is that she has so much *in* her mind. She is able to summon up and hold in her mind her knowledge of all twelve people on her team—their personalities, their accomplishments and failings, their relationships with her and with each other, what Peter thinks about some of them, which one just put the down payment on a house, which one is just about to send his son off to college; her knowledge of the project, where it stands, what remains to be done, who will be doing what; her knowledge of Peter, all the support and advice he has given her over the years, her feelings about him at different times. She doesn't know much about his family or his relations with his own superiors, but what she does know stands out vividly in her mind. In the background of her mind, as it seems, are articles she has read about how layoffs were conducted in other companies, horror stories of callous treatment, what other people have told her about what happened to them or to people they knew. Also in the background, more "felt" than remembered, it seems, are the moral lessons she has been taught all her life, her own experiences of having been cheated or lied to, her vivid memories of having treated other people badly, whether inadvertently or out of anger.

Where is all this information and how does the prefrontal cortex get the information it needs? A region of the brain called the anterior cingulate cortex seems to be the prefrontal cortex's research librarian. It swings into full operation as soon as the ventromedial module receives the emotionally marked signals from the drives. It then makes contact with a large and powerful region of the brain called the neocortex.

The modern human brain is approximately three times larger than that of our nearest animal cousin, the chimpanzee. Much

of this extra capacity is committed to the neocortex, the brain's storehouse of knowledge and know-how which can be retrieved and put to use to make decisions about whatever situation is at hand. The difference this makes is not only quantitative but also qualitative. We use these mental resources to make the kinds of decisions that only human beings can make or need to make. Some of these resources are only recently being properly understood, and the implications for leadership are very important.

An obvious implication, but one that needs to be pointed out from time to time, is that we are designed to make our decisions deliberatively. There is a certain charisma attached to people who can make split-second decisions, and of course sometimes this is necessary. But most important leadership decisions need not and should not be made this way. The previous discussion of the true nature of emotions suggests that emotions should be taken seriously, and indeed effective leadership has always included an element of what is figuratively called "instinctive" reactions. What we can see as we study the leadership brain is that it is not usually necessary to make some sort of choice or trade-off between these two contributions. If we understand the emotions as genuine information, they can take their rightful place with other, seemingly more "objective" information.

MEMORY

I don't think I need to say a lot about memory. We remember a huge variety of things—people, objects, scenes, actions, feelings, meanings, words, images, music, even memory itself (as when we remember that there was something we used to remember)—and although we can't always remember exactly what we want to remember, nevertheless we rely constantly on a vast storehouse of remembered information and know-how. For example, the average English speaker has a vocabulary of between ten and twenty thousand words.

CULTURE

A lot of information comes to us pre-packaged, so to speak, in the form of whatever culture we grow up in or are living in. This includes social norms of behavior, rituals, specific beliefs (from the

belief that stealing and burying an egg will cure warts to the belief that democracy is the best form of government), use of various tools and crafts (kids in some cultures learn to use buttons and switches; others learn to live with goats), all forms of art, all forms and styles of buildings, clothing, cooking, dancing, courtship, storytelling, warfare, sports, and, more recently, science, and the list goes on and on.

This greatly reduces the number of things an individual has to figure out; these things have already been figured out at least satisfactorily, if not optimally. And for a species that survives by figuring things out to know how to react to situations, it is a crucial advantage not to have to figure out every piece of every response. Helen, for example, has to figure out how to handle her situation. But if she decides to talk with Peter, she doesn't have to figure out how to approach and carry on a conversation with a higher-status, more powerful person, including how a woman should do so with a man; that's something she has already absorbed from her culture and stored in her neocortex. (Naturally, a Japanese or Austrian or Brazilian woman in Helen's position would have absorbed a different way of taking up a difficult subject with her male boss, or would have learned not to do it at all.) On the other hand, if she decides she has no choice but to keep the layoffs secret and lead her team to the slaughter, she doesn't have to figure out how this will be seen by her team; the ethics of concealing the truth, of "following orders," of saving yourself even if others will not be saved, are a part of her culture which she has already absorbed and stored in her neocortex.

Note, though, how different this kind of cultural know-how is from instinct. For one thing, it does have to be learned, however informally or even unconsciously. For another, cultural knowledge can be deliberately revised over time. How we relate to people of higher status, for example, has changed drastically over the past several decades. Our society and our organizations are still organized into hierarchies of power and status, but the specific techniques for navigating these hierarchies change.

Leadership sometimes means changing the culture in which your followers live and work. One way to look at that is that you are changing the content of other people's neocortexes so that those people's prefrontal cortexes are better equipped to resolve the competing claims of the four drives originating in their limbic

areas. That's a lot more personal than "changing the corporate culture," and it's no small thing.

In 1945, George Murdock, a leading anthropologist, produced a list of the cultural traits that were practiced in every single one of the several hundred human societies that were documented in the Human Relations Area Files at Yale University. Exhibit 2.1 presents his whole list. It's a fascinating list and, by now, you should be able to see how some of these cultural traits serve one or more of the four drives.

All this stored treasure of individual and cultural information is amazing enough, but we have something more: built-in capabilities for learning certain particularly important things. This is a subtle concept, somewhere between having an instinct and ordinary learning.

MENTAL SKILL SETS

Many animals have "skills" which amaze us—the ability to spin webs or migrate long distances—but no animal is capable of such a variety of skills as we are, nor of improving and adding to them all through life. Why are we like this? One of the newest developments in our understanding of how the mind works is the avalanche of information about genetically encoded skill sets. For example, scientists now understand that our brains have evolved into a mechanism that can genetically carry some specialized elements of language from one generation to the next. This is what enables children to learn a language (or several) so quickly without any formal instruction. For example, Gary Marcus and his team of psychologists at New York University have found that seven-month-old infants pay more attention to sentences with unfamiliar structures than to sentences with familiar structures.[26] This means that the babies could recognize formal rules of grammar—and when they were being broken—well before they could speak or understand the actual words.

But it appears that language is only one of our built-in skills. Evolutionary psychologist Steven Pinker[27] has suggested a more complete inventory:

- *Intuitive mechanics:* seeing how objects can be manipulated
- *Intuitive biology:* understanding how plants and animals work

EXHIBIT 2.1. MURDOCK'S LIST OF UNIVERSAL ELEMENTS OF CULTURE.

Age grading	Faith healing	Luck superstitions
Athletic sports	Family feasting	Magic
Bodily adornment	Fire making	Marriage
Calendar	Folklore	Mealtimes
Cleanliness training	Food taboos	Medicine
Community organization	Funeral rites	Obstetrics
Cooking	Games	Penal sanctions
Cooperative labor	Gestures	Personal propitiation of supernatural beings
Cosmology	Gift-giving	Puberty customs
Courtship	Government	Residence rules
Dancing	Greetings	Sexual restrictions
Decorative arts	Hair styles	Soul concepts
Divination	Hospitality	Status differentiation
Division of labor	Housing	Surgery
Dream interpretation	Incest taboos	Tool making
Education	Joking	Trade
Eschatology	Kin-groups	Visiting
Ethics	Kinship nomenclature	Weather control
Ethnobotany	Language	Weaving
Etiquette	Law	

- *Numbers:* recognizing how some numbers are larger or smaller, how numbers can be added and subtracted
- *Mental maps:* picturing large territories
- *Habitat selections:* recognizing how some regions are more conducive to life than others
- *Danger:* understanding major hazards such as snakes and heights
- *Food:* knowing what is good to eat
- *Contamination:* having intuitions about contagion and disease
- *Monitoring:* being aware of current bodily well-being

- *Intuitive psychology:* predicting other people's behavior
- *A mental Rolodex:* keeping a database on important individuals
- *Self-concept:* having a notion of one's own identity
- *Justice:* having sense of rights, obligations, and so on
- *Kinship:* recognizing family structures
- *Mating:* having an intuition about the choice of a mate[28]

Is Pinker serious about all these skills? Is he serious, for example, about our having a genetically available Rolodex of important people in our lives? He is very serious, and we have reason to take him seriously. Consider how many voices you can recognize almost immediately on the phone; within about five words—any words—you know who it is and get right down to business (whether it's dealing or dishing). Helen, of course, knows dozens, perhaps hundreds, of people throughout her organization and can instantly relate them to each other in terms of function, hierarchy, and in some cases office politics—including many people she barely knows or has never met. While the specific information about each of these people has, of course, been learned through experience, the mental mechanism that enables you to access it so quickly is, Pinker argues, an innate skill. Such built-in skills are evidence that we have evolved to work well together in groups. Good leadership and followership are in our natures.[29]

Note that Helen is also aware of the tensions in her body. It is an important survival skill to know how the various parts of one's body are feeling in order to know when one is injured, when one is too tired to do something safely, when one is getting wet, and so on. For inhabitants of an ever-shifting social environment such as ourselves, tensions such as Helen's convey important information with survival value.

THE DORSOLATERAL MODULE AND WORKING MEMORY

Eavesdropping on Helen's interior consultation with herself, we can hear her bouncing back and forth between alternative plans. Maybe she should do what Peter asked her to do. Maybe she should try to circumvent him. No, better not to try that. To pull

off this juggling act, Helen's prefrontal cortex needs to keep all these different proposals "in mind," along with the knowledge and know-how relevant to them, such as what she knows about Peter, what she knows about navigating company politics, and so on. And indeed, this "keeping in mind" doesn't happen by magic. Just above the orbitofrontal module lies the dorsolateral module, where, as psychologist Rita Carter puts it, "things are held 'in mind' and manipulated to form plans and concepts."[30]

We know, of course, that this is what we all do all through the day. Leaders need to appreciate this ability for the neurological miracle it is. Without it, the impulse/check/balance process would be impossible. A leading neuroscientist, Joseph LeDoux, writes, "Working memory is one of the brain's most sophisticated capacities and is involved in all aspects of thinking and problem solving."[31] As Elkhonon Goldberg says: "At every point of the [decision-making] process we need to access a particular type of information which represents but a tiny fraction of our total knowledge. Our ability to access it is like an instantaneous finding of a needle in a haystack, and it is nothing short of astounding."[32]

When the prefrontal cortex, aided by the resources of the neocortex, arrives at a tentative decision, this proposal is sent to the orbitofrontal module, which feeds it back downward, through a dense mass of neural connections, to the limbic area to test whether it is at least tolerable to all the four drives.

If the drives are still not satisficed—if the signal reemerges from the limbic area with still another set of conflicting emotional markers—the whole feedback loop will be repeated until a proposal is found which does satisfice all four drives.

THE ROSTROMEDIAL AND ROSTROLATERAL CORTEXES: WHAT I AM

As we reach the last stages of the work of the prefrontal cortex in decision making, I have to mention some recent research that is powerfully suggestive, although it is too soon to draw any definitive conclusions from it. Kalina Christoff, of the University of British Columbia, has focused her work on the abstract reasoning process, self-reflection, and self-value judgments.[33] It seems that decisions that are so complex that they require self-referential evaluation

(such as "Would I do that?") engage the rostromedial cortex of the prefrontal cortex, which seems to function as the emotional self, and the adjacent rostrolateral cortex, which seems to function as a memory of the cognitive self.

These could be the prefrontal cortex modules that process the testing feedback from the drives that are evaluating action options before they are acted on. These may be the prefrontal cortex modules that "will" the final action on the most difficult problems—what Christoff calls the "tip of the consciousness pyramid." It may well be the place where we keep our memories of who we are, what we stand for, what we aspire to be—the seat of our integrity and character.

The final proposal that does satisfice all four drives is then relayed to motor centers that control movement and speech; deliberation—some conscious, some unconscious—will now become action (or restraint).

To fully appreciate the impulse/check/balance mechanism, let's look at two experiments in which it *doesn't* happen. In one experiment, Damasio and other researchers used a game to compare a group of people with normal brains and a group of people who had suffered brain damage in the ventromedial module. Each player was given $2,000 of play money and began picking cards from four decks labeled A, B, C, and D. Depending on the cards chosen, money was lost, gained, borrowed, or repaid. The goal was to end up with as much money as possible. What the participants didn't know was that the decks were rigged; compared to C and D, A and B yielded larger wins but the losses were larger still. Most players favored A and B at first, but players with undamaged brains eventually figured out that C and D were the real winners. Players with ventromedial damage, on the other hand, never did. They stuck with A and B until they went "bankrupt."[34] And this was very much the behavior they had shown in real life since their brain injuries—an inability to steer clear of risks that would seem obvious to the rest of us.

For these unfortunate people, the impulse/check/balance system had been short-circuited by the damage to the module that sent proposed solutions back through the limbic system to be "reviewed" by the four drives. In an undamaged brain, the drive to acquire and the memory of early wins with decks A and B would

naturally favor choosing A or B *again*. But then a string of heavy losses would cause the drive to comprehend to object: "It doesn't make sense that the 'winning' decks have been losing so much." The prefrontal cortex, aware of the conflict, would work to come up with a solution that satisficed the drive to acquire by winning money and satisficed the drive to comprehend by making sense, or at least by not obviously failing to make sense. It might suggest favoring C or D simply to try something that hadn't failed. It might go back and forth a few times until it was convinced that the two pairs of decks were consistently different. And then it would stick with C and D. But all of this would depend on the prefrontal cortex being able to send new questions to the drive to comprehend. Is drawing from the A and B decks really winning? Does it make sense? If the prefrontal cortex were unable to do that, the whole process would remain stuck on its first successful strategy.

Psychologist Sarah Boysen and her team at Ohio State conducted a revealing experiment in which chimpanzees chose between two tempting dishes of candy.[35] The chimps had already learned to point at the dish they wanted, but this time there was a catch: when a chimp pointed at dish A, with more candy, he was given dish B and dish A went to another chimp. Although these chimpanzees had shown significant cognitive abilities in other tests, they couldn't seem to learn to pick the smaller dish of candy so they would get the larger one, even though they hated seeing the other chimp get the prize. By contrast, children given this test quickly got the hang of it (although children under two years of age did have some problems).

Human children and chimps both have the drive to acquire; both begin with the impulse to choose the bigger dish of candy. The chimps are clever and they know the results of their choices aren't making sense, but the human children have something different—an *independent* drive to comprehend. Because this drive is independent, it is able to check the drive to acquire, giving the prefrontal cortex a chance to hold off on grabbing the "obvious" dish and try to devise a different plan of action that will satisfice both drives by (a) making sense, as the present situation does not, and (b) getting the most candy. There appears to be nothing in the brains of the chimpanzees that can check their impulse to go for the most.

CHECKS AND BALANCES AMONGST THE DRIVES

The impulse/check/balance process is an extremely powerful way to get along in the world. The four drives do not cancel each other out or fight themselves to a standstill; nor does any one of them attain permanent dominance in a healthy person. Instead, by their very clashes, they provide the impetus for an endless variety of possible problem-solving responses to the endless variety of the world. This works because the drives are (1) independent—one drive cannot be "bought off," so to speak, by fulfilling the others and (2) insatiable—all four criteria are always active and can never be fulfilled "once and for all." It also works because drives will act on satisficing ("good enough") solutions.

So important is the checking and balancing that we even seem to have evolved inherent skill sets for resolving tensions between the drives. For example, social scientist Jordan Peterson has focused his attention on a skill set for detecting and responding to novelty or surprises in the environment.[36] Upon the appearance of something new and unknown, a person will often feel both fear and curiosity—emotions representing the drive to defend and the drive to comprehend. Peterson believes we have a genetically built-in skill to manage this particular standoff.[37] The first step is to freeze all motion and focus intently on the novel event. Then make a small move that is safe, trying to elicit more information about the novel object. Step by step in this process we try to judge the object dangerous or not according to what it most closely resembles from our previous experience (stored in the neocortex). Of course, this first approximation may prove to be wrong, but on the whole, a mechanism for quickly and simultaneously satisfying both the drive to comprehend and the drive to defend—that is, to learn something that may be useful without getting hurt or killed in the process—would be an aid to survival for a species that relies on problem solving rather than instinct. And because it is a built-in skill, we do not have to figure out this basic mechanism, only the specific action plan that best fits the circumstances.

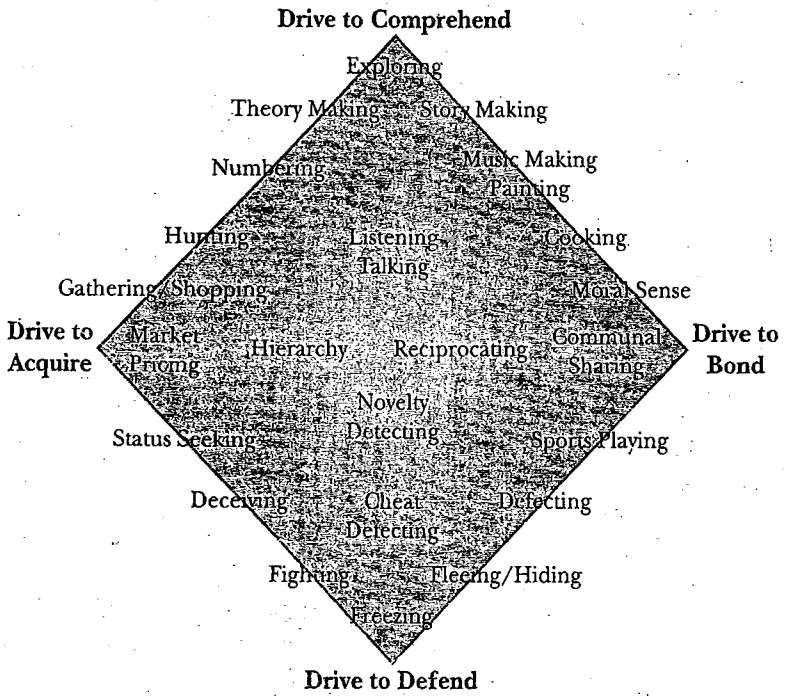
Social psychologist Alan Fiske's work has focused on four built-in skill sets that check the drive to acquire and the drive to bond against each other and achieve a balance.[38] These four skill sets are

(1) communal sharing—universally applied within family groups but also sometimes applied to the extended family and beyond; (2) hierarchy—agreement within a group on who has higher status, and thus deserves some deference; (3) reciprocity—willingness to do a favor now in expectation that the favor will eventually be returned; and (4) market pricing—simultaneous exchange of valued goods either by barter or with money. Expressed this way, they sound rather abstract, but Fiske's important point is that they are everyday behaviors, so natural to us that we don't even think about naming or categorizing them. Think, for example, of a group of college roommates. They freely share what's in the fridge (communal sharing) as long as no one is obviously freeloading (not reciprocating). They do not, however, help themselves to each other's computers. If Joe really wants to have Chris's computer, they might agree to a sale or a trade (market pricing). Joe would not get away with telling Chris what to wear to class, but Chris might dress more formally if Joe's parents were visiting (hierarchy). All of this would happen naturally, and violations of these unspoken rules would be immediately understood as "not being a good roommate." As Fiske puts it, "People understand their social life in terms of these four models, and they attempt to impose these relational structures on their social world. People want others to conform to the models."[39]

These skills help us balance the drive to get what we need with the drive to get along with each other well enough to meet most of our collective needs. Taken together, they are the alternative to getting what you need by constant fighting and stealing and fending off attack—the normal life of many animals—or to the total self-sufficiency and solitude of a Gila monster.

Fiske hypothesizes that these four skill sets are innate because they seem to be universal and there is some evidence that they surface spontaneously in children, without being taught. If Fiske is correct that these behaviors are genetically inherited skill sets, this is essential knowledge for leaders. For example, the relationships between a business firm and its employees are typically thought of by economists as strictly market transactions—the so-called "labor market." Mainstream economists—and the many business executives who have absorbed their ideas—simply do not recognize the other three skill sets as having anything to do with it. Such bosses

FIGURE 2.2. SKILL SETS ARRAYED ON A FOUR-DRIVE QUADRANGLE.



will be ignoring the many other ways, via the other three drives, they have available to reward employees and readily engage them in the collective effort. This limits their ability to provide good leadership.

In Figure 2.2, a variety of skill sets is arrayed to show how they could help the prefrontal cortex check and balance the four drives.

A COMPREHENSIVE TEST: THE ULTIMATUM GAME

One of the more effective demonstrations of the existence of drives in humans comes from the "ultimatum game," an experimental device carefully designed by behavioral economists to test for the existence not only of a human drive to acquire but also of other

possible drives. It has turned out to be a surprisingly good test for the existence of all four of our hypothesized drives.

Two experimental subjects are randomly chosen to be the "Proposer" and the "Responder." The experimenter gives the Proposer some money—let's say it's twenty five-dollar bills—and both players can see how much it is. The Proposer is to place as much of the money as he chooses in front of the Responder as a "take it or leave it" offer. If the Responder accepts the offer, he or she keeps that money and the Proposer keeps the rest. If the Responder refuses the offer, neither party gets anything. Take a moment now before reading on to decide what you would offer as a Proposer. Learn below how your proposal would pay off.

Neoclassical economic theory predicts that any rational self-interested Proposer would offer the smallest possible amount—one five-dollar bill—knowing that any rational self-interested Responder would take it, since five dollars out of the blue is clearly better than nothing. In contrast, our four-drive model predicts that Proposers will try to satisfice all four of their drives. They will try to figure out (dC) how to end up with as much cash as possible (dA) while also staying on good terms with the other player (dB) or, at the very least, not making an enemy of the other player (dD). If the Proposer's offer leads to all four of these outcomes, it will be a real four-bagger, a home run in terms of all four drives. If the Proposer's offer is rejected, it will be a total strikeout, a loser by all four criteria: no money, no friend, a possible angry enemy, and a failure to comprehend the game.

Both players know that the $100 is an unearned windfall, which has arbitrarily given the Proposer a first-mover advantage. The Proposer will also reason, or at least sense, that the Responder has the same four drives he or she has and will therefore take a minimal offer as an insult. The reaction would likely be, "Stick that offer, you cheap bastard." What would be the minimum amount needed to earn an acceptance along with a pleased smile? The Proposer can't be sure, but it would be worth any reasonable cost to avoid a rejection, a four-way loss.

(You may be thinking that no one would actually be thinking all these things. That's true; the four drives are unconscious. But even if we don't sense them directly, we sense the conflict between them by means of the emotional markers attached to them in the

limbic system and detected in the prefrontal cortex. We know we are having trouble making up our minds.)

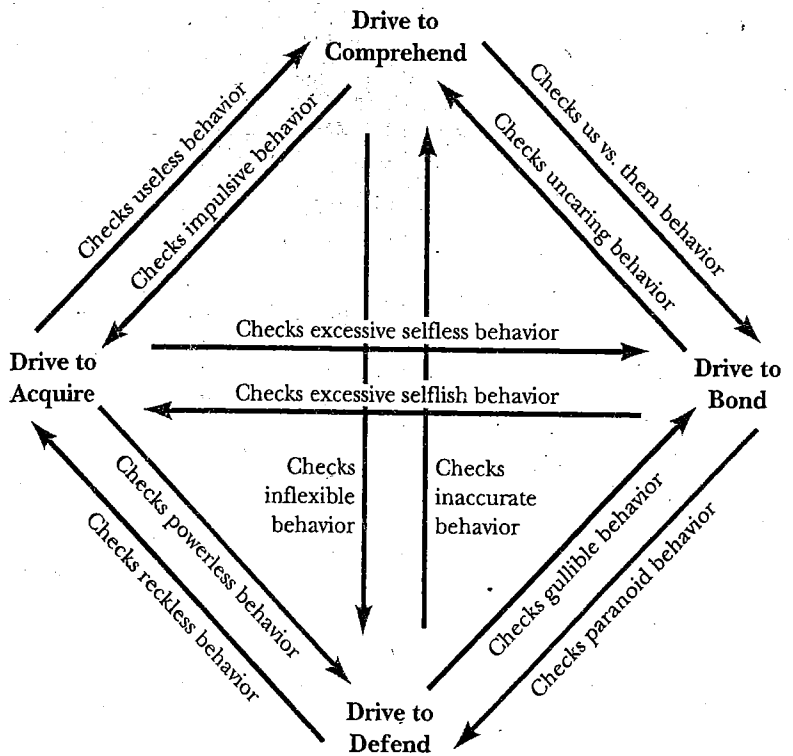
When this experiment was actually run in industrial societies, the mean offer of Proposers was 44 percent of the total money. Virtually no Responders accepted offers of 20 percent or below. This result has come as a shock to mainline economists, since it dramatically contradicted the predictions of standard economic theory.

This consistent, but puzzling, finding led some behavioral economic researchers, joined by some anthropologists, to conduct a careful multicultural test designed to avoid a developed-country bias. Ultimatum game experiments were conducted in fifteen small nonindustrial cultures in twelve countries. Each experiment was set up as an economic exchange between two people who were members of the same culture but were strangers to each other. The experimenters offered rewards that were significant in local terms, worth several days of work. The average size of the proposals in each of the fifteen cultures ran from a low of 26 percent to a high of 58 percent. No group displayed the "rational" economic behavior—the lowest offer possible—predicted by standard economic theory. Something besides rational self-interest was influencing people's behavior, and on a worldwide basis. As the principal researcher, Joseph Henrich of the Institute for Advance Study in Berlin, concluded: "People everywhere put a social spin on economic exchanges."[40]

As I see it, people all around the world, both Proposers and Responders, seemed to be seeking what they defined as "fair" exchanges that actually served to satisfice all four drives. Proposers actually came out winners by having their offers accepted by Responders in 94 percent of all cases.[41] They were demonstrating a very high capacity to predict how the Responders would respond. They came away with a reasonable amount of cash (dA) and a good idea of how they won it (dC), having finished on good terms (dB), or at least not on bad terms (dD), with the other player. Fully indoctrinated economists would have been consistent losers. It does, however, offer significant support to our model, even though the designers of the experiment had never heard of it.

Later in the book, we will see that the impulse/check/balance algorithm has much wider applications; it provides a way to channel the clash of human individuals and groups into satisfactory

FIGURE 2.3. IMPULSES AND CHECKS.



responses, just as it channels the clash of our innate drives into satisfactory responses. We will also see that some of the worst problems facing our society arise from the lack of an impulse/check/balance system, or the perversion of such a system.

Figure 2.3 presents examples in diagrammatic form of our hypotheses about the kind of check each drive gives the other three.

CONCLUSION

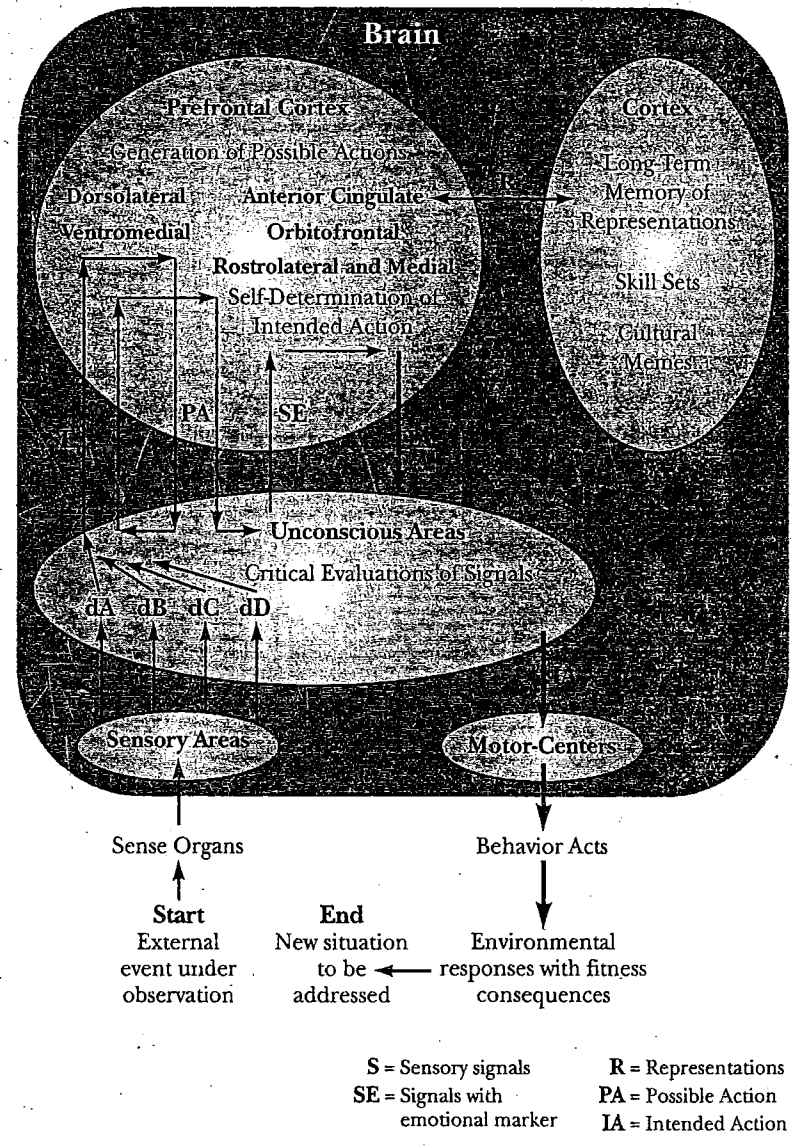
You can see now that the title of this section, "The Leadership Brain," is somewhat misleading. I certainly do not propose that people with a particular kind of brain will make the best leaders

and that we should find out who they are and put them in charge. I propose that the normal human brain is the leadership brain and that we should all put our leadership brains to work, at the very least, leading ourselves in balanced lives and working cooperatively with others, and perhaps also becoming leaders of others in the usual sense—but if so, then good leaders.

We can be encouraged to have discovered that good leadership rests on such strong foundations. Helen has very tough choices to make, but her brain is designed to make them. Not necessarily easily or happily, but reasonably well. Speaking in ordinary terms, we would say "she's got a lot on her mind," "she'll weigh her options," and "she'll try to make the best of it." These are figures of speech, but now we see how accurately they describe what is actually happening in her brain. She has a lot on her mind because, like any normal human being, she has four basic drives, all of which have been activated by her situation, and because she has a neocortex loaded with personal memories, cultural knowledge, and know-how skills. She'll weigh her options because her prefrontal cortex will generate possible actions to take and use its impulse/check/balance mechanism (the ventromedial module, anterior cingulate cortex, dorsolateral module, and orbitofrontal module, plus input from the neocortex and feedback from the limbic system). She'll make the best of it because her prefrontal cortex will strive to send a solution that has satisficed all four drives for all the key people involved on to the motor cortex for action. Figure 2.4 is a schematic of how all of these brain parts work together to make leadership decisions.

Figure 2.4 offers a schematic summary of the theory of the leadership brain that this book offers—a theory that still needs a name. I have chosen to call it the Renewed Darwinian (RD) Theory of Human Behavior and Leadership. This name acknowledges that its major elements are built upon insights of Darwin's, drawn from his *Descent of Man*. His insights have, of course, been strengthened by many subsequent studies. Darwin's contributions are rounded out in the next chapter as we address the essential question of how the leadership brain, as described, could have evolved by Darwinian mechanisms.

FIGURE 2.4. SCHEMATIC OF HOW THE BRAIN WORKS AS A DECISION-MAKING APPARATUS.



Finally, let me say that the fact that this is what the brain is designed to do is why I think the overall quality of leadership of all kinds can improve over time, much as the physical aspects of our lives have improved over time. Perfection will elude us—it is obvious every day that our leadership brains can make mistakes—but we can learn to use them better and to undermine them less often.

CHAPTER THREE

DARWIN REDISCOVERED

Did the Brain Evolve Leadership Capabilities?

Preference on the part of the women steadily acting in one direction, would ultimately affect the character of the tribe.[1]
— CHARLES DARWIN

With strictly social animals, natural selection sometimes acts on the individual, through the preservation of variations which are beneficial to the community.[2]
— CHARLES DARWIN

The following proposition seems to me in a high degree probable—namely, that any animal whatsoever, endowed with well-marked social instincts [dB], would inevitably acquire a moral sense of conscience, as soon as its intellectual powers [dC] had become as well, or nearly as well developed, as in man.[3]
— CHARLES DARWIN

Drawing heavily on Darwin's key insights, such as those above, along with recent findings from several disciplines, this chapter will piece together an answer to the query posed in its subtitle. The answer is my summary of a currently emerging scientific consensus. Future research undoubtedly will extend or even replace this story with a more accurate one, but for now I do not know of another answer that accounts for more empirical evidence.