

THE
REWIRED
BRAIN

FREE YOURSELF *of* NEGATIVE BEHAVIORS
and RELEASE YOUR BEST SELF

DR. SKI CHILTON
WITH DR. MARGARET RUKSTALIS AND A. J. GREGORY



BakerBooks

a division of Baker Publishing Group
Grand Rapids, Michigan

© 2016 by Ski Chilton

Published by Baker Books
a division of Baker Publishing Group
P.O. Box 6287, Grand Rapids, MI 49516-6287
www.bakerbooks.com

Printed in the United States of America

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means—for example, electronic, photocopy, recording—without the prior written permission of the publisher. The only exception is brief quotations in printed reviews.

Library of Congress Cataloging-in-Publication Data is on file at the Library of Congress, Washington, DC.

ISBN 9780801007477 (cloth)

ISBN 9780801019463 (ITPE)

Unless otherwise indicated, Scripture quotations are from the Holy Bible, New International Version®. NIV®. Copyright © 1973, 1978, 1984, 2011 by Biblica, Inc.™ Used by permission of Zondervan. All rights reserved worldwide. www.zondervan.com

Scripture quotations labeled ESV are from The Holy Bible, English Standard Version® (ESV®), copyright © 2001 by Crossway, a publishing ministry of Good News Publishers. Used by permission. All rights reserved. ESV Text Edition: 2011

Scripture quotations labeled Message are from THE MESSAGE. Copyright © by Eugene H. Peterson 1993, 1994, 1995, 1996, 2000, 2001, 2002. Used by permission of NavPress. All rights reserved. Represented by Tyndale House Publishers, Inc.

Scripture quotations labeled NASB are from the New American Standard Bible®, copyright © 1960, 1962, 1963, 1968, 1971, 1972, 1973, 1975, 1977, 1995 by The Lockman Foundation. Used by permission. (www.Lockman.org)

Scripture quotations labeled NKJV are from the New King James Version®. Copyright © 1982 by Thomas Nelson, Inc. Used by permission. All rights reserved.

Scripture quotations labeled NLT are from the *Holy Bible*, New Living Translation, copyright © 1996, 2004, 2015 by Tyndale House Foundation. Used by permission of Tyndale House Publishers, Inc., Carol Stream, Illinois 60188. All rights reserved.

Some names and details have been changed to protect the privacy of the individuals involved.

This publication is intended to provide helpful and informative material on the subjects addressed. Readers should consult their personal health professionals before adopting any of the suggestions in this book or drawing inferences from it. The author and publisher expressly disclaim responsibility for any adverse effects arising from the use or application of the information contained in this book.

The author is represented by The FEDD Agency, Inc.

16 17 18 19 20 21 22 7 6 5 4 3 2 1

In keeping with biblical principles of creation stewardship, Baker Publishing Group advocates the responsible use of our natural resources. As a member of the Green Press Initiative, our company uses recycled paper when possible. The text paper of this book is composed in part of post-consumer waste.



Dr. Ski Chilton with Dr. Margaret Rukstalis and A. J. Gregory, *The Rewired Brain*
Baker Books, a division of Baker Publishing Group, © 2016. Used by permission.

Contents

Introduction 7

Part 1: Reflect 15

1. A Tale of Two Minds 17
2. Stuck in Overdrive 39
3. Fear-Obsessed 57
4. Your Brain on Change 77

Part 2: Reframe 97

5. What It Means to Be Human 99
6. Right and Wrong Matters 119
7. When Tragedy Strikes 137
8. Facing the Greatest Challenge—
Parenting 155
9. It's Not You, It's Me 175
10. The Gift of Intimacy and Sex 195

Part 3: Rewire	213
11. Who Am I?	215
12. Surrender	231
13. Forgiveness and Freedom	251
Acknowledgments	269
Notes	271

Introduction

Growing up in a small tobacco farming community at the foothills of the Appalachian Mountains in North Carolina did not stir much excitement. But when Daddy brought home our first black-and-white television set, it was like the second coming. Outfitted with rabbit-ear antennas, it occupied a corner of our tiny two-room cinderblock house. Because my family lived in the backwoods, not even having the luxury of indoor plumbing, the only channel we could get was CBS. Just as well. It was the one network that broadcasted an annual showing of my favorite movie, *The Wizard of Oz*.

Waiting year after year for that brilliant film to air was like waiting for the president's arrival. My parents, my sister, and I would huddle around the set in the small living room, which also served as the bedroom to us all, in great anticipation, as if we had never before seen the film. While the movie is dear to me for several reasons, fifty years later I am struck by its brilliant message that, all throughout their perilous adventure, Dorothy and her pals had always possessed the

very things they were desperately seeking. Dorothy could go home at any time. The Scarecrow already had a brain, the Tin Man a heart, and the Lion courage. And yet they were convinced that the Wizard was the only one who could remedy all of their problems.

The scene in which Dorothy and her entourage finally arrive in Oz and stand before the great and powerful Wizard still gives me chills. Seeing his giant head shrouded in smoke and flames and carrying on in a booming and threatening voice frightened the living daylights out of me as a child. But as we all discovered, there was nothing to be afraid of. The great and powerful Wizard didn't exist, just a wise little man behind the curtain.

I love the scene near the end when the Tin Man asks Dorothy what she learned in Oz. She responds, "Well, I—I think that it—that it wasn't enough to just want to see Uncle Henry and Auntie Em—and it's that if I ever go looking for my heart's desire again, I won't look any farther than my own backyard. Because if it isn't there, I never lost it to begin with!"¹

Like Dorothy, many of us are lost in the inner dimensions of our minds, trying to discover who we are and why we are here. We wander through a wilderness of bewildering and difficult places, situations, and relationships. Perhaps most menacing are the cyclones of our past experiences, such as traumatic childhoods, critical broken relationships, and difficult life transitions, which produce in us fear, shame, anxiety, and depression.

What would happen if you discovered you have within you the capacity to heal your past brokenness, to direct the transformation of your mind and your life? What would

happen if you finally realized you have more power over your unhealthy behaviors, painful feelings, and harmful interactions than you think? What would happen if you realized the past devastation and current chaos of your life could become the critical lessons necessary to move you to a higher state of consciousness? What would happen if you could unleash the power of your mind to live your best life?

What This Book Offers

Great news! As human beings, we have the capacity through our incredibly powerful and flexible minds to transport ourselves back to Kansas. Should we choose, we can transition our lives from discontent and static to beauty and joy. Through science, psychology, and real-life stories, *The Rewired Brain* will help you understand the framework of your mind. You will be able to determine the reason you continue to engage in destructive behaviors and have such negative feelings. You will learn how to recognize harmful emotional patterns and how to stop engaging in them. And you will be able to do all of this through the plasticity (flexibility) of your brain and your enormous and wonderful capacity to rewire it.

This book focuses on the human brain because it serves as the foundation, hardware, and software for all of our reactions, responses, behaviors, emotions, sensations, and choices. It is the source of millions of unconscious and a far smaller number of conscious thoughts each day. It is the foundational setting where we can either become and stay imprisoned in unhappiness or discover and live in freedom. To move forward, we must venture into our brains and

reexamine our lives to make sense of our past and current actions, recognize our faulty and destructive habits and patterns, and ultimately rewire them so we can have joyful and meaningful lives.

In the pages that follow, you are going to read some fancy scientific and psychological terms like *brain plasticity*, *epigenetics*, and *dual process reasoning*. Don't let this language trip you up. By understanding the human brain, you are going to see how your thoughts and brain circuitry affect your emotional and spiritual journeys with God and with others.

It is not my mission to give you a technical description of how your brain works for science's sake but to allow you to name and give context for your behaviors and emotions. What you will learn is fundamental to helping you experience the process of change and find ultimate freedom in all areas of your life, including personal growth, relationships, and sexuality.

With that said, the key premise of this book is that your brain is divided into two systems of thinking (System 1 and System 2), and they compete for your attention, feelings, emotions, and actions. Supremacy by System 1 gives rise to a person who is absolutely controlled by their unconscious fears and instincts and is highly influenced by experiences from their childhood and environmental factors (such as fear-based advertisements, twenty-four-hour news cycles, and certain forms of religion). The second force or system of thinking is much more developed, deliberative, and uniquely human and where we find the true nature of a person.

Individually, these two systems of thinking are not all bad or all good, like an angel sitting on one shoulder and the devil on the other. The two simply have different roles, and both

are necessary for your survival and happiness. When the two are not balanced, however, and one force dominates your thought patterns, your human experience gets compromised in meaningful and agonizing ways. No need for details here; I tell you everything about these two systems in chapter 1. What you need to know right now is that throughout this book Dr. Rukstalis and I show how you can rewire the very brain circuits from which these two forces come. She and I combine our professional and life experiences to bring you the insight provided in this book. This insight comes from my three decades of studies in biology, biochemistry, genetics (most recently epigenetics), neuroscience, philosophy, and theology at academic centers such as Wake Forest and Johns Hopkins as well as Dr. Rukstalis's three decades of study in addiction psychology at Dartmouth, Harvard, Penn, and Wake Forest universities.

What You Will Find

The ReWired Brain is broken up into three parts: Reflect, Reframe, and Rewire.

Part 1 (Reflect) explores dual process reasoning (DPR): where it comes from, why it matters, and what happens when one system veers into overdrive. Part 2 (Reframe) delves more deeply into how we can balance these two powerful systems in our brains in specific aspects of life. Part 3 (Rewire) will help you work through self-exploratory and transformational exercises and practices to rewire your brain.

At the end of each chapter in parts 1 and 2, we will ask you to thoughtfully answer some questions to help you begin the process of self-discovery and brain rewiring. Don't let these

inquiries intimidate or overwhelm you. We present them as initial exercises to help you personify and activate the processes of reflection and recognition necessary for change.

This book is for you if:

- You have experienced intense pain and trauma as a result of your past.
- You have made relational mistakes that have hurt yourself and others.
- You are ready to transition away from your destructive responses and situations to find joy and peace.
- You are determined to uncover new and better ways to find and express who you really are at your core.

What This Means to Me

Before you read this book, you should know two things about me. First, I am a serious scientist who insists on using the scientific method to examine specific questions that can be addressed by science. I am also quite cognizant that the world of scientifically answerable questions is relatively small when compared to the big questions of who we are, why we are here, and whether there is a God who loves us. When we get to these issues, science cannot speak with anything near a definitive voice, and so we then must move to other disciplines such as philosophy and theology as well as our individual belief systems.

Most scientists and philosophers maintain a materialist belief system. Their central thesis is that our thoughts, our morality, our consciousness, our experiences, the partners we select, and whether we choose to believe (or not) in a

higher power are products of a predetermined, complex set of chemical and electrical processes and reactions that take place in the deep recesses of our brains.

I, however, believe there is a God, what some might call a higher power, who loves and desires to interact with us. I also believe he created the extremely complex portions of our brains in order for us to be able to commune with him spiritually. It is certainly not necessary for you to share this belief to benefit from this book, but this is the place where I reside.

Second, although I have had incredible professional success in academia at both Johns Hopkins and Wake Forest Universities Schools of Medicine, as an author of four popular diet books, and as a businessman starting several profitable companies, the significant relational disasters, intense personal pain, and unexpected tragedies I have experienced in life have taught me the most. I have spent intense effort and engaged in much professional counseling trying to understand the whys of my life. The intense desire to make sense of my own reality drove me to examine the mysteries of the human brain. It prompted me ultimately to find a model that helped me understand my reality and, perhaps most importantly, the inconsistencies in my behavior. Researching through the model of our two systems of thinking helped me understand how, on the one hand, I could be this well-adjusted scientist and humanitarian who loved everyone and wanted nothing more than to make the world a better place and, on the other hand, this highly emotional, reactive, depressed, and destructive mess who kept failing at relationships and hurting himself and others no matter how he wanted to do otherwise.

Over the past decade, I have put in the hard work necessary not only to gain new understandings from the fields of neuroscience, philosophy, and psychology but also, more importantly, to get to know myself, recognize my major unconscious fears and feelings and their origins in my past, and figure out how not to react to their prompting. Most of all, I have been able to connect with God and understand that he wants nothing more than for me to experience freedom, joy, and love.

In his beautiful book *Warrior of the Light*, Paulo Coelho describes the pain and disappointments of life as “the beloved marks and scars that will open the gates of Paradise to me.”² I love this because if we allow whatever pain we experience—whether self-inflicted or caused by others—to be our teacher, it can transition us to a new place. So if you have opened this book and are hurting at this moment, congratulations! You now have a great opportunity for the change and rewiring necessary to move you toward a better life.

We want to introduce you to your true self, perhaps for the first time, and help you be free. There is hope. There is possibility. You can experience liberty in your emotional and spiritual health, your relationships, and even your intimacy and sexual desire. It will take knowledge and courage. It will also take honest and fearless self-reflection. It will take surrender and forgiveness. It will take time. And it will take effort. But you will never again have to be stuck in a matrix of unhealthy and harmful cycles. A hopeful future of possibility awaits.

REFLECT

We begin by taking you on a journey to get to know your brain—particularly your two systems of thinking and how they constantly battle for your attention. You will learn what happens when these two forces are not balanced and one dominates the other. By the end of this section, you will be encouraged by the exciting news that regardless of how your brain has been wired to control your behaviors and emotions thus far, it can be changed.

1



A Tale of Two Minds

Humans are amphibians—half spirit and half animal. . . . As spirits they belong to the eternal world, but as animals they inhabit time. This means that while their spirit can be directed to an eternal object, their bodies, passions, and imaginations are in continual change, for to be in time, means to change. Their nearest approach to constancy, therefore, is undulation—the repeated return to a level from which they repeatedly fall back, a series of troughs and peaks.

C. S. Lewis, *The Screwtape Letters*

He is a nasty grump. A greedy, penny-pinching, crotchety character with a heart as cold as ice and as hard as steel. Ebenezer Scrooge spews bitter venom on anyone who is near. He knows he is a social pariah, but he doesn't care. In fact,

it pleases him to “edge his way along the crowded paths of life, warning all human sympathy to keep its distance.”¹

We can all agree that Scrooge, whom we have either read about or seen on film in the classic *A Christmas Carol*, is a bad man, a monster even. So it is quite astonishing when, through a series of visitations from ghosts, including a tormented former business partner, he experiences an epiphany. Viewing his tragic and lonely childhood, his present contemptible existence, and his future death creates in Scrooge an impetus to change. Toward the end of the tale, a remarkable transformation takes place. Bounding from monster to humanitarian, caustic to joyful, miserly to charitable, Scrooge embodies the miraculous.

What happened to Scrooge? Was he given a new personality that Christmas Eve? No. I believe the true miracle that day was that he rediscovered who he really was. In fact, the visit from the ghost of Christmas past revealed that his goodwill and compassion had been quashed by his neglectful and cruel childhood, his mother’s absence, his lack of friends at boarding school, and ultimately the loss of his only love, his exquisite fiancée, Belle. In a profoundly moving scene, she gently explains why she must leave him. “You fear the world too much. . . . All your other hopes have merged into the hope of being beyond the chance of its sordid reproach. I have seen your nobler aspirations fall off one by one, until the master-passion, Gain, engrosses you. Have I not?”² Clearly, there were two very different men within Scrooge, but the one overwhelmed by fear and pain buried the caring, kind, and generous one and allowed the monster to emerge.

The idea that there are two competing systems of thinking within the human brain has been well documented through-

out human history. Paul, the writer of much of the New Testament and an influential leader of the early Christian church, clearly articulated the two opposing factions that constantly competed for his own mind. He wrote:

What I don't understand about myself is that I decide one way, but then I act another, doing things I absolutely despise. . . . I realize that I don't have what it takes. I can will it, but I can't *do* it. I decide to do good, but I don't *really* do it; I decide not to do bad, but then I do it anyway. My decisions, such as they are, don't result in actions. Something has gone wrong deep within me and gets the better of me every time. (Rom. 7:15, 18–20 Message)

I sense in these words that Paul is absolutely beside himself. He feels that he is going mad. He hears proverbial voices telling him to do things that he knows will have bad outcomes, and yet he does them anyway. Paul is in the midst of a civil war in his mind. We, too, desperately desire to reconcile the warring parts of our minds to find our true selves, peace, and freedom. We want to be more patient and not overreact, but our anger gets the best of us. We want loving and peaceful marriages but continue to fight and compete with our spouses over seemingly insignificant issues. We want a good life but continue to get stuck in unhealthy or destructive cycles and relationships.

All of us have these conflicting voices shouting in our brains. So how do we make sense of a brain in constant struggle? Why do our brains work like this? Will we ever find peace?

To begin to address these vital questions, this chapter provides fundamental information about how your brain

works. My goal here is to describe a practical model of the human brain so you can begin to make sense of your reality. Once you do that, you can then begin to reflect on your past and recognize patterns of behaviors and emotions that have worked and those that have been destructive.

Free or Not Free?

Psychologists, philosophers, and theologians have long been fascinated by how we know ourselves, the limits of self-awareness, and the impact of not knowing ourselves. Most of us take for granted that we have free will, a choice in how we act in any situation.

It may surprise you that many biologists, psychologists, and philosophers called *determinists* or *behaviorists* believe that we have little, if any, free will. According to these camps, genes in our DNA and our early life experiences form our brain architecture, circuits, and wiring, as well as levels of nerve signals (neurotransmitters) and their receptors. Together, these genetic and physiological factors pre-program our brains in a manner that completely dictates our reactions and the thoughts that define our positions and responses to the issues we face each day. Consequently, we have little, if any, freedom in the way we act.

Determinists believe that we do not have free conscious thoughts or the ability to reason, second-guess, weigh decisions, or exert executive control over our behavioral responses. Accordingly, we lack self-control over our primal instincts because there is no self and thus no self-directed authority. For instance, a child who witnesses parental violence and repeats that same aggression had no other choice

and is not responsible for their actions. Their current aggression is an inevitable outcome of the prior events experienced as a child.³

While there is much truth that genes and past experiences highly influence our present and future feelings, beliefs, and behaviors, is that all there is to life? What is the point of life if everything is already predetermined?

For me, one of the most troubling aspects of determinism is that good and evil, right and wrong, have no meaning. When we are simply reduced to a deterministic set of physical and chemical events, nothing is good or evil; it just is. People act how they were programmed. If this is reality, we cannot hold anyone responsible for events that had no other possible outcomes. I do not think it is an accident that the most horrible and deadly dictators of the past hundred years (such as Hitler, Stalin, Pol Pot, and Mao) all based much of their regimes' activities on deterministic philosophies. If free will and the choice between good and evil are eliminated, all that is left is humanity's capacity to destroy the weak.

In contrast to determinism, I have been influenced by the work of humanistic philosophers such as psychoanalyst Erich Fromm, particularly his books *Escape from Freedom* and *The Art of Loving*. Fromm argues that all humans have the capacity, the freedom, to change and direct their own lives; many, however, are simply too afraid to do so. This philosophical position provides a central theme found throughout this book.

I, however, like my deterministic colleagues, believe that most of us are paralyzed by the fears and primitive survival instincts from our genes, our past trauma, and a manipulative culture that constantly tries to scare us. In this state of

mind, we indeed have very little free will. But unlike many determinists, I also believe that we can develop the capacity to think differently and overcome what Freud called unconscious, repressed fears and pain in order to change ourselves. This is true freedom—and freedom is the ultimate goal of our journey together.

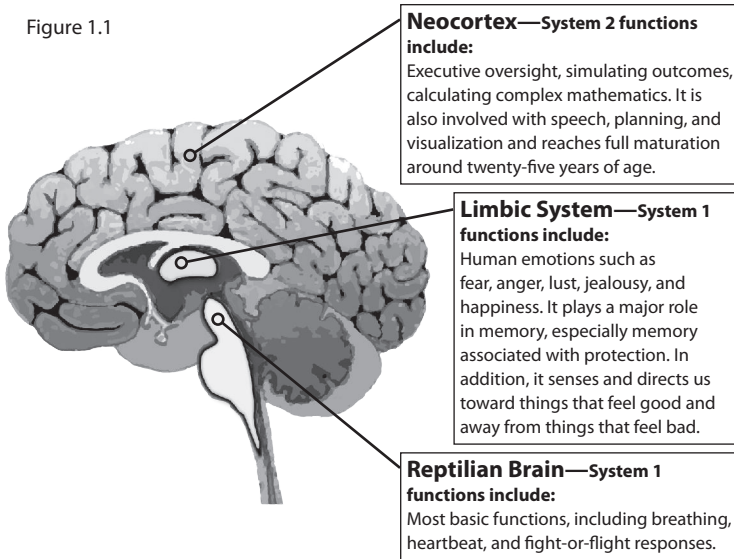
Dual Process Reasoning (DPR)

The primary focus of this chapter, and the basis of this book, is a mind theory known as dual process reasoning (DPR). Understanding this concept is crucial for you to make sense of your reality, your behaviors, your emotions, and your thoughts.

DPR has received a great deal of attention in both the psychological and the neuroscience worlds because it provides a practical framework to describe our actions and feelings from both a physiological and a behavioral perspective. Because it offers a logical approach to discussing issues concerning the dual nature of humankind—free will and ethical responsibility—it has also gained considerable interest in philosophical and theological circles. Most recently, it has even begun to appear in sales and marketing literature as a model for designing the most effective strategies to get people to buy things.

The central idea of DPR is that there are two very distinct types of responses and reasoning that arose at distinct points during human development and that they operate in very different ways. The interaction between these two systems determines our personalities, our outlooks, our characters, our emotions, and our behaviors.

Figure 1.1



You may have heard this theory introduced under different names (slow thinking vs. fast thinking, the unconscious vs. the conscious, reasoning vs. intuition, automatic thinking vs. controlled thinking). For the purposes of this book, I will use the terms *System 1* and *System 2*. Understanding these two systems and wiring or rewiring them in specific ways will lead you to a free and meaningful life.

It is important at this point to note my distinction between the brain and the mind. While I use both terms throughout this book and they are clearly related, there are critical differences. For me, the brain is easy to define. It is the organ of soft nervous tissue where nerve cells (neurons) communicate with the world and our bodies and control functions, movements, sensations, reasoning, feelings, and thoughts.

The mind is more mystical and complex because while it involves many of the components mentioned in regard to the

brain, such as thinking, reasoning, and feeling, it combines all of these functions with the more metaphysical concept of who we are, or what I will refer to in this book (and explain more thoroughly in a bit) as the *Self*. I have illustrated the brain locations where the activities of these systems reside in Figure 1.1.

System 1

Developed over millions of years, System 1 responses are primitive reactions, feelings, sensations, and intuitions associated with animal-like survival instincts. System 1 originates predominantly from regions of the lower (reptilian) and mid (limbic system) brain and is responsible for unconscious emotions and reactions that center on survival instincts, including reproduction, protection, control, competition, and pleasure.

System 1 analysis and responses are fast, automatic, and effortless. What we see, hear, smell, taste, and touch become electrical signals that travel through the primitive portions of our brains and trigger emotions, impressions, and intuitions. We have little sense of what System 1 says to us because it is activated rapidly, without our even knowing it. Consequently, we do not have the freedom to decline or edit its messages. System 1 signals flood our brains constantly, and we can do nothing to stop them.

From a survival perspective, System 1 is highly efficient at remembering past events and particularly trauma that threatened or harmed us and unconsciously making us aware of them using fear, or flight-or-fight, responses. For example, if you are a woman and your father neglected or abandoned

you when you were a child, there is a high likelihood that the threat to your well-being as a child will be transferred into adulthood as unconscious feelings of a fear of abandonment or feeling unlovable in intimate relationships. This in turn often leads to a world of heartbreak for you and others around you. These types of early cause-effect scenarios will be a central theme of this book.

Because System 1 is always on, it is responsible for much of our spontaneity as well as key aspects of social popularity and creativity. It also unconsciously performs our most familiar and practiced routines, including walking, driving, and language recognition.

System 1 plays a crucial role in one of the most basic human instincts and deeply rooted characteristics found throughout nature: survival of the fittest. For early humans, this meant the capacity to survive and eventually reproduce to pass their genes down to the next generation. In order to do this, a person had to have power to control their environment and others in that environment.

This primitive need to control is the basis of both beneficial and destructive competition evident in all aspects of the modern world. The fittest of today are individuals who successfully accumulate material possessions, rack up professional accomplishments, score sexual conquests, and increase social or wealth status, as well as those who disguise greed as ambition and dominate others in relationships.

System 2

System 2 reasoning resides in the outer regions of our brains (the neocortex and particularly the frontal cortex).

Compared to System 1 and from a neuroscience perspective, it is more sophisticated and seems to have developed very recently, only within the last one hundred fifty thousand years. Responsible for conscious thought and reasoning, it is logical and deliberate. In contrast to System 1, we know what System 2 says to us and can control when we engage this thinking.

The capacity to use System 2 to make conscious choices appears to have been a critical milestone in human history. It shifted us from being humans largely driven by our primitive, animal instincts to humans with the faculty to carry out higher-level cognitive functions, have distinct personalities, and make complex decisions.

System 2 can also monitor and intervene in certain high-stakes situations to anticipate and recognize System 1 alarms and respond in healthier and morally meaningful ways. For example, our instinctive System 1 response to a physical threat or harm by another might be to defend ourselves by hurting that person, thereby immediately eliminating the threat. However, if a teenager attempts to physically assault an adult, the adult may engage System 2 reasoning if he knows the teen and the fact that he was horribly abused growing up. Given the adult's System 2 awareness of the teenager's background, he can engage his System 2 to override System 1. He can make a reasoned choice to try not to hurt the kid. Instead, he can block the blows and hold the teenager at bay. The adult's System 2 understands the deep sense of pain experienced by the young person and reacts with grace and love, not retaliation and force.

For the purposes of this book, System 2 has five critical functions. It

1. houses the essence of who we really are;
2. reflects on complex problems and issues, weighs the pros and cons of past decisions and future options, and arrives at creative and positive solutions;
3. corrects or overrides System 1 responses when it is convinced that those responses are not beneficial to us and are harmful to others;
4. searches for and recognizes higher-level morality and the capacity to love and give selflessly; and
5. reflects God's image and allows us to intimately commune with and be in relationship with him.

I believe that the extraordinarily sophisticated neocortical brain regions that house System 2 are also where the core of who we are resides. I call this the true *Self*, a term I will henceforth capitalize and italicize throughout this book. My hope in doing so is that this typographical treatment will remind you, the reader (as well as me, the author!), of the particular meaning I intend.

Your *Self* is your individual life force that longs to be free and expressed. It makes you aware that you are a separate entity, apart from others, yet still connected to and a member of humanity. With it, you sense that from the day you were born you were a unique being, unlike anyone else on this planet.

Your *Self* encompasses the essence of who you are and who you have the potential to be. It is that part of you that gives you the capacity to balance System 1 and System 2 in a healthy and beautiful manner. Importantly, your *Self* makes it possible for you to interact with God and act in ways that reflect his image.

Your *Self* is also the part of System 2 that is capable of *Self*-reflection. In its highest form, your *Self* is a co-creator

with God, because as your *Self* thinks spiritual, loving, and compassionate thoughts, those very thoughts directly form the patterns and connections within your brain circuitry that lead to loving and meaningful actions.

Your *Self* determines when it is necessary to involve other System 2 analysis and reasoning functions to balance your life and move in a healthier direction. Your *Self* can override your natural tendency to control your current situation, regret past decisions, or worry about the future. It can accept imperfections and mistakes as important learning experiences and embrace uncertainty of the future as a beautiful adventure. It gives you the capability to make free choices, which can include higher-level morality decisions and the capacity to love others without expecting anything in return. It is the intermediary and arbitrator between your eternal spirit and your animal nature, the part of your mind where you can find and experience faith.

The underpinning of this book is that although most of us have the freedom to change and the capacity to find and express our true *Selves*, we are simply too afraid or overwhelmed by our unconscious minds (reflected by System 1 responses) to do so. But the promise is that change is possible. Your true *Self*, the best you, can emerge with time, practice, and patience.

The Connection between the Two Systems

It is crucial to point out that System 1 and System 2 communicate with each other continuously via complex sets of nerve circuits or wires. Interactions between the two systems are the basis for our thoughts, actions, and personalities. Perhaps most interesting and important, especially in the

context of this book, is that circuits between different brain regions can be changed or rewired by experiences and our own new thoughts and ideas. This in turn alters our behavioral habits and responses to our surroundings and the way we live. This process, known as *neuroplasticity*, is one of the most significant areas of study in neuroscience, and I will discuss it in great detail in chapter 4.

A key principle that we will come back to over and over in this book is that the more powerful an experience, habit, or thought, the stronger a brain circuit will be. The more this circuit is used, the stronger it becomes and the larger it grows. In contrast, unused brain circuits and the thoughts, behaviors, and emotions they produce weaken. Thus, what areas of life we focus on is critically important to who we become.

System 1 is a powerful force. It provides a constant and often overwhelming stream of unconscious signals. Because its functions cannot be turned off, it typically prevails over System 2's logical and conscious thoughts.

Theoretically, System 2 provides executive control over System 1. However, this requires great effort and discipline and the use of approaches such as deep *Self*-reflection, meditation, group or individual counseling, and prayer. Without regular practice of these important disciplines, the two systems operate more independently of each other and often work at cross-purposes.

Balance Matters

I want to emphasize an archetype universal in every field of science and every aspect of our lives: balance is critical. As a scientist whose work addresses processes that weaken or

REFLECT

Figure 1.2

System 1 Brain	System 2 Brain
Located in more primitive portions of the brain ("reptilian" brain and limbic system)	Located in the advanced portions of the brain (front brain, neocortex, and particularly the frontal cortex)
Acts fast and effortlessly	Acts slowly and requires effort to get involved
Houses the unconscious <i>Self</i>	Houses the conscious <i>Self</i>
Recognizes and responds to danger with fear and action; remembers previously experienced threats	Calculates and simulates outcomes after weighing the pros and cons of a situation
Drives survival and competitive instincts	Critical for higher level morality and sacrificial choices
Triggers emotions (intuitions, impressions, desire, and feelings)	Responsible for deliberative, logical, and deductive reasoning, including mathematical statistics
Responsible for impulses, habits, drives, and reactions that give rise to creativity and spontaneity	Creates and analyzes abstract concepts
Looks for immediate causes and patterns, especially those that resemble past events	Reflects in consideration of bigger picture options
Often inaccurate and is incapable of fact-checking	Capable of fact-checking and executive function to override System 1 reactions and responses

sicken the human body, I can tell you that balance matters. If one biological system is out of control while another designed to control or counter that original system is diminished, our bodies will not work properly and typically will damage themselves.

System 1 is not bad and System 2 good, or vice versa. We need them both to live healthy lives. When one system is in constant overdrive, the other underfunctions and we feel and behave in ways that dramatically limit our capacity to experience joy. Therefore, the two systems must be balanced. Figure 1.2 gives a summary of the specific characteristics of the two systems.

System 1 has a number of key advantages, including helping us rapidly respond to a crisis or danger and perform daily tasks like walking and driving. It is also responsible for much of our spontaneity, creativity, and intuition. Let's also be clear. Feelings, sensations, and responses from System 1 can be fun and quite pleasurable (some of which will be explored in chapter 10).

But what it means to be human involves System 2. Its functions help us understand we are unique entities with the incredible capacity to *Self-reflect*. We can make free choices, look at the big picture, and simulate a wide range of outcomes. System 2 also allows us to make selfless choices and connect with our Creator.

So we need them both, in *balance*.

I have seen System 1 compared to Homer on the hit TV show *The Simpsons* and System 2 to Spock on *Star Trek* or Data on *Star Trek: The Next Generation* (depending on your age). While this may not be the most scientific analogy, it does allow us to think about the different capabilities and the advantages and disadvantages of the two systems.

Take Homer, for instance. He's a fun guy, the life of the party, unpredictable. While he would probably be a blast to hang out with for an evening, Homer would also most likely act irrationally in the face of danger and make impulsive decisions without considering others.

Now think about Spock and Data. While not the most creative, spontaneous, or fun-loving types, these guys would help you analyze and solve a complex problem. They would likely remain calm in a stressful situation and do what they thought was right without emotional input.

While these three characters have great qualities in their own right, wouldn't it be great if we could balance them

out? Luckily for us, I believe we can beautifully balance the spontaneous, fun-loving, creative, and social aspects of System 1 with System 2's capacity for deep introspective analysis, sophisticated problem solving, and higher-level morality. Think Captain James T. Kirk, Captain Jean-Luc Picard, and Marge.

In his book *Strangers to Ourselves*, Timothy Wilson points out that most mundane tasks of living are delegated to the unconscious mind. The conscious mind, System 2, is like the CEO of a large company, and the employees who carry out the daily activities are like the unconscious mind, System 1. The beautiful and delicate balance of roles between CEO and employees is what makes a company (life) successful.⁴

A company will go awry if the CEO or its employees do not do their jobs or misuse or neglect their positions and power. For example, if the CEO does not know everyone's roles, fails to focus and direct the company, or neglects the executive role of vision, oversight, and correction, the company will fail. The CEO must constantly monitor the organization, know their *Self*, and understand the purpose of the company. When they do so, all components of the organization are efficient and work well together to move it in the right direction.

If, however, the employees rally, take over the company, and move it in an unhealthy and destructive direction without the CEO's intervention, the company will deteriorate into chaos and devastation.

This can be true in our lives. If System 1 runs rampant without System 2 oversight, we can suffer in cycles of broken relationships, sadness, depression, unhealthy obsessions, and overwhelming fear. It is up to us to find our *Selves* within

System 2 to direct System 1 to turn the ship around and stop destructive behaviors.

A Downward Spiral

It does not matter how small the sins are provided that their cumulative effect is to edge the man away from the Light and out into the Nothing. Murder is no better than cards if cards can do the trick. Indeed the safest road to Hell is the gradual one—the gentle slope, soft underfoot, without sudden turnings, without milestones, without signposts.⁵

We humans have an incredible capacity to adapt to whatever path we are on, no matter how dysfunctional or unmanageable. Ironically, unless we learn *Self*-reflection to monitor our pain, we will remain stuck in the same recurring situations, never considering that we might need to change.

C. S. Lewis is my favorite author and greatest contemporary influence. One of his most popular books, *The Screwtape Letters*, is a series of thirty-one letters from Screwtape, a senior demon, to his nephew Wormwood, a junior tempter who is trying to get a man into hell.

In the above quotation, the senior demon reminds his nephew that it is best not to lure the man toward the “big” sins (like murder and adultery) because a life absent of *Self*-examination, reflection, and honesty will do the trick and carry less risk. It is much safer to let the man think that while his life might not be ideal, it is better than most and there is no need to change course. In other words, keep it simple.

Keep the man’s pain at a tolerable level, and he will not wake up. Assure him he is a decent fellow, but at the same time encourage him to repeat the same mistakes and the same

REFLECT

negative behavioral patterns. Keep him stuck in the same toxic relationship cycles with his wife, family, and friends. And never, ever allow the man to consider for one moment that his troubles may be of his own making. No, no, no. Settle in the man's mind that his problems are his wife's, his friends', his neighbors', his co-workers', and his mother's fault. Then your job is done, and your man safely makes it to hell.

Does this scare you as much as it scares me? As I reflect on my life, I was, many times, on that gradual downward slope, falling deeper and deeper into the throes of pain and loneliness (more on this in the next chapter). I was walking around in a make-believe dream world, never aware of the true reality around me. Perhaps most frightening was that at the time I was convinced that I was just fine.

Oh, I knew I was unhealthy. I had high blood pressure and was diagnosed with depression and was regularly seeing doctors to treat these conditions with medication.

At the time, I believed these illnesses resulted from a combination of my genetics and a chemical imbalance that could be treated with prescriptive meds. Today, however, I believe that my System 1 overreaction responses were the basis of most of my emotional and physical pain.

Our minds and our bodies cannot endure constant and overwhelming feelings such as fear, anger, pain, regret, and resentment that come into our lives each day without serious physical and emotional repercussions. Eventually, we break. Our minds and bodies get sick. We don't know why we are falling apart because these feelings arise from the unconscious mind (System 1), which is inaccessible to us. Consequently, we cannot consciously process and make sense

of them. All we know is that we hurt badly and are deeply depressed and incredibly lonely.

The United States claims the highest rates of mental illness in the world. More than 25 percent of Americans report they suffer from mental illness; the most common are anxiety and mood disorders.⁶ Research also estimates that more than half of Americans will experience mental illness during their lifetimes.⁷ These diseases devastate our society; incapacitate our personal, social, and work lives; cost the United States over three hundred billion dollars and more each year; and cause premature death.⁸ I believe that System 1 in overdrive is much of the basis of our mental illnesses. In the next chapter, you are going to learn why that is.

Modern society makes it easy to numb our pain rather than address the problem. Our unhealthy compulsions, addictive tendencies, depression, and mood disorders can be dulled just enough to prevent our pain from reaching a level that awakens us to our need to change.

Don't get me wrong. I value the external healing powers of integrative medicine, prescription medications, and cognitive and psychodynamic therapies. I am fully aware that oftentimes medications help people function and stay alive. That said, I advocate that we need a new language and approach to teach individuals how to balance System 1 and 2 responses so they can optimize their strengths as opposed to only treating symptoms.

So how do we find and fix the problem? It starts with learning to think and do differently.

I am reminded of my pole-vaulting experience in college. During many a track team practice, after my numerous failed attempts to clear the bar, my coach would scream, "Ski, you

are not getting high enough!” I was always tempted to respond, “No kidding, Captain Obvious.” My coach never understood that yelling was not an effective means to help me change my approach. I needed instructions on what I could do differently to correct the part of my jump that needed to be fixed.

Likewise, it is useless to keep telling someone:

“Snap out of it!”

“Work harder. Try again!”

“Stop being so obsessive (or controlling or sad or anxious)!”

“Just say no to drugs, alcohol, promiscuity, or binge eating!”

You need to understand the source(s) of your problems, fears, and pain and equip your *Self* with the tools and approaches that will help you move up and over the bar to your goals, far away from the downward slope. We aim to help you do this throughout this book.

This Works!

Understanding dual process reasoning has been the most important discovery of my life. It has allowed me to make sense of my current reality, change my past damaging behaviors, and find and express my true *Self*.

I use this model practically every day to analyze situations and take a more reasoned, conscious approach to resolving them. I say things like, “Ski, you are acting very System 1 in this circumstance. Is that really how you want to look at this problem? Is there truly a threat that you should be responding to like that?” Or when interacting with another, I will often think, “That person desperately needs control.

I don't believe it is safe to work with them or that I would enjoy working with them." While I was writing this book, my twenty-nine-year-old son and his friends picked up the lingo. Now I overhear them say, "Man, I'm System 1-ing out today. This girl (or situation) has me freaked out!"

With use of the dual process reasoning approach, I am free to give my feelings and reactions a name and understand where they come from. I am free to shift when I judge others with negative adjectives such as "mean," "selfish," and "bad" and instead recognize the imbalance in the two systems of thinking. I am also free to understand when I can't influence another's behavior and must therefore put boundaries in place. Now I can focus on what I can change: my thoughts and how I choose to act.

That said, I am not perfect. I have a deep System 1 drive that believes I can fix any situation, any person, anything. My default thoughts sometimes scream, "Look at me! I went from a house without a bathroom in rural North Carolina to being rapidly promoted through the academic ranks at Johns Hopkins and Wake Forest. I can remedy anything, and with enough effort, I can't be stopped!" Unfortunately, my hard work to change the opinions or behaviors of others has gotten me into a world of trouble. I will talk about the reason for this System 1 drive in chapter 2, but for now let's just say that Melody Beattie's *Codependent No More* lives on the nightstand next to my bed.

Reflection: The Pathway to Rewire Your Mind

The first step to rewire your brain is to realize something is wrong in your life. While you do not have to identify exactly

REFLECT

what that is just yet, take some time to pause and answer the questions below. These are designed to help you begin the process of *Self*-reflection and discovery.

1. Do you have overwhelming feelings and emotions in your mind concerning important areas of your life? What are they?
2. Have you faced difficult or even devastating situations and question how you handled them? Choose one and think about what you could have done differently.
3. Are there times when, like the apostle Paul, you know the right thing to do but do the opposite? Why do you think that is?
4. Do you believe your future is predetermined and you have little or no power to change it? Why or why not?