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SHELLEY CARSON, Ph.D.

Your CREATIVE BRAIN

*Seven Steps to Maximize
Imagination, Productivity, and
Innovation in Your Life*



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CREATIVE
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Published by Jossey-Bass

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989 Market Street, San Francisco, CA 94103-1741—[link:www.josseybass.com]

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Library of Congress Cataloging-in-Publication Data

Carson, Shelley, date

Your creative brain: seven steps to maximize imagination, productivity, and innovation in your life / Shelley Carson.

p. cm.

Includes bibliographical references and index.

ISBN 978-0-470-54763-2 (hardback); ISBN 978-0-470-65103-2 (ebk); ISBN 978-0-470-65142-1

(ebk); ISBN 978-0-470-65143-8 (ebk)

1. Creative ability. 2. Cognition. 3. Brain. I. Title.

BF408.C216 2010

153.3'5—dc22

2010018175

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To Stevie and Nacie—the creative bookends of my life

 **PREFACE**

This book begins in a small lab room in William James Hall. It is a late fall afternoon, and the shadows are growing long as Professor Bill Milberg removes the specimen from a formalin-filled Tupperware container. As usual, the source of this coveted specimen remains shrouded in mystery, leading to wild speculation among the doctoral students about how Milberg obtained it. He places it in my gloved hands, and I am suddenly transfixed. It is an almost mystical experience. What I am holding is an individual's universe—the sum of one man's knowledge, his dreams, his favorite songs, his memories. I am holding a human brain.

The enormity of the power of this object threatens to overwhelm me (or maybe it is the formalin fumes?) and I think: *How is it possible that the concepts for skyscrapers, interstate highway systems, orchestral symphonies, great works of literature and art, rockets that will take us to the moon and beyond, as well as acts of intense greed and cruelty all have their beginnings in an object similar to the three-pound universe within my hands? How bold—and how creative—is the human brain! How is it possible that the brain, small enough to fit within my curved hands, can conceive and manifest all our human-made marvels?* I suddenly realize that to attempt to answer this question will be an insatiable driving force in my professional life.

Fast-forward to 2010. By now, I've had the privilege of meeting hundreds of creative brains—housed within the skulls of the unique individuals who have taken part in my studies, enrolled in my creativity courses, and consulted me to help them in their creative professions. Many of these individuals have been instrumental in talking me into writing this book. Let me briefly introduce you to three of those creative people.

Corey was a student in my creativity course a few years ago. When it came time to engage in some of the creativity tests we conduct in the class, he declined. He told me that he wasn't creative himself but was only taking the course because his girlfriend was an artist and he wanted to understand her better. (Corey, you get kudos for wanting to understand your girlfriend but you still have to take the tests!) Of course, it turns out that Corey was creative after all; but his pathway to innovative output was different from that of his girlfriend, and he needed to understand how to access his own unique pathway.

Jenna is an interior designer who almost lost the career she loved because she was having trouble coming up with new ideas. Every time she had an idea about a new design, she immediately rejected it because it didn't conform to the outdated standards she had learned in design school decades ago. She contacted me because she was afraid to let herself think innovative thoughts that weren't "tried and true." Jenna needed to get out of the *evaluation* mode before she could take advantage of her innate ability to generate new ideas.

Richard, an independent film producer and director who contacted me for help, had just the opposite problem. Unlike Jenna, he couldn't *stop* his innovative thoughts, and as a result, his latest film was in crisis. Each night he came up with original ideas for plot changes, character nuances, set design changes, and new ways to depict the deep themes within his movie. The next day, he'd stop production to go over these exciting modifications with the cast and crew. Eventually, most of the cast left the project, fed up with the constant changes and delays, and Richard was left with nothing but the great visions in his mind to show for all his time. Richard had to learn how to stop

generating ideas and focus on the work of *implementing* them.

Perhaps like Corey, you feel that there are creative people and there are uncreative people (and you have placed yourself in the latter category). Perhaps like Jenna, you sense that creative ideas are out there ready to be discovered, but you're afraid to let go of the "safe" mental space that's bounded by what is "tried and true." Or perhaps like Richard, you're full of creative ideas but unable to stop generating them long enough to bring any one idea to fruition. If you identify with any of these, you'll find that I wrote this book for you!

Here is something I've learned in the years of study and experimentation since my first encounter with the human brain in Bill Milberg's class. The differences between the brains of highly effective creative achievers and the brains of the rest of us are far less important than the commonalities. There are certainly genetic differences that influence creativity, and of course, there will always be people who are more creative than others. However, through the study of highly creative brains, we've found that *all* of us have creative brains. We are all—barring serious brain injury—equipped with basically the same brain structures. It is the way we *activate* these structures (our brain activation patterns) and the way we form connections between these structures that appear to affect our ability to think creatively. The exciting part is that new findings indicate we can manipulate these brain activation patterns—and we can form new connections within the brain—with training; in short, we can learn to activate our brains in similar patterns to those of highly creative individuals.

In this book I present a model that describes seven different brain activation patterns. I call this the CREATES brainsets model. It is based on neural activation correlates of what I believe to be the most salient mental aspects of human creativity. These include: openness and cognitive flexibility, mental imagery, divergent or associative thinking, convergent or deliberate thinking, judgmentalism, self-expression, and improvisation or flow. In my model, these aspects of creativity are conceived as *states* (or transient mental activation patterns) rather than as *traits*. Some of these states facilitate the generation of creative ideas, while some of them facilitate the implementation of ideas. The trick is to know which is which and how to get from one to another. That's what this book is about.

Clearly all of these states of creativity have their own underlying brain mechanisms; hence some of the confusion in the research literature about how creativity actually plays out in the human brain. It is my contention that you can enhance your creative output by: (1) understanding which of these various states related to creativity you prefer—I call this preference your "mental comfort zone"—and (2) gradually venturing out from your comfort zone to explore different aspects of creativity by learning to modify your brain activation state.

Although the CREATES model is just that—a model and not proven scientific fact—it is based on the latest neuroscience and research in the field of creative thinking, and the training aspects of the model are based on established psychological methods of behavioral change. Each of the seven brain states described in the CREATES model is accompanied by a set of exercises to help you enter that state. Like most such exercises, these have not been studied in rigorous trials to prove their efficacy, but they've produced positive results for the Coreys, Jennas, and Richards with whom I've had the pleasure of working. I urge you to sample a wide variety of the exercises and decide for yourself which are most effective for you.

My hope is that the contents of this book will aid and inspire you to take your innate creative abilities to the next level. And I invite you to let me know about your results! You can contact me—and explore the additional reader-only content and interactive tools—at [link:<http://ShelleyCarson.com>]. I challenge you now to read further, and then to discover, to perform, to produce, to invent, or to express—in short, to take advantage of—the unique and precious resources that dwell within YOUR CREATIVE BRAIN.



ACKNOWLEDGMENTS

Your Creative Brain is truly the product of many creative brains, most prominently that of wonder woman Julie Silver, my editor at Harvard Health Publications. This book would not exist without her vision, expertise, enthusiasm, and encouragement. It's hard to believe one person can wear so many hats and be so good at them all! Thanks for your guidance and creativity, Dr. Julie! Along with Julie, I'd like to thank Tony Komaroff at HHP, as well as those who provided insightful blind reviews. Speaking of reviewers, I owe a debt of gratitude to mentor and colleague Ellen Langer for her helpful editorial comments.

This book also owes its existence to my literary agent, Linda Konner, who insisted that I write a book and who knew this book would be written before I knew myself. Thanks, Linda—I hope this is the first of many! Thanks also to Betty Anne Crawford, who took my manuscript to the world.

To Alan Rinzler, my editor at Jossey-Bass, thanks for believing in this book and for making the process so easy for me! Thank you also to Nana Twumasi, Susan Geraghty, Donna Cohn, and all the folks at Jossey-Bass and Wiley who helped in the production of this book. And to Richard Sheppard, thank you for your artistic additions!

My lovely daughter, Nacie, who is a writer extraordinaire in her own right, was instrumental in helping me shape academic content into readable prose. Thank you for helping me with the vision and the revision of this work! You are my source of inspiration, and it was so fun to share the process of writing this book with you.

I'd like to thank three scholars who have been instrumental in my career: Jordan Peterson, now at the University of Toronto, who has been my mentor and is now my colleague, friend, and constant wellspring of creative research ideas; Richard McNally, who took me into his lab when I was an orphan grad student and has continued to amaze and inspire me to this day; and Jill Hooley, who first encouraged me to explore the topic of creativity as a worthy academic endeavor.

I want to thank all of the students who have taken my creativity courses over the years and have contributed as much to my knowledge of the subject as I (hopefully) have to theirs. To the many artists, writers, musicians, and film directors and producers who have consulted me concerning their creative difficulties (and triumphs!), please know that you have contributed so much to my knowledge of the creative process (and please don't be upset if you see yourself—identity changed to protect the innocent, of course—in this book!).

Thanks are also due to the scholars, authors, and friends who took the time to read my manuscript and who contributed valuable commentary, including Stephen Kosslyn, Howard Gardner, Tal Ben-Shahar, Teresa Amabile, Dean Keith Simonton, Harrison Pope, Alice Flaherty, Dan Schacter, Bernard Golden, Diane Terman, and Peter Marc Jacobson.

It's hard to imagine how anyone can write a book without extensive support on the home front. My husband, David, has nurtured me throughout the writing process, providing meals, an occasional glass of wine during my marathon nighttime writing sessions, good advice, and hugs when needed. Love always, honey!

Thanks also to my son, David Jr., who also helped provide food and support while he was home for winter break. I owe you a few home-cooked meals, Son!

Finally, I would like to acknowledge Caveman #2 and indeed all the courageous men and women who, from before the dawn of written history, used their creative brains to pave the way for the incredible wealth of art, music, and scientific advances we enjoy today. They gave us the wheel and tools, harnessed fire, and recorded their experiences on the walls of caves. They travelled from continent to continent without the aid of ships or navigation. They endured enormous hardships yet their spirit of exploration and ingenuity endured and allowed us to be here today. We truly stand on the shoulders of unnamed creative giants!

PART 1



Meet Your Creative Brain

Wanted: Your Creative Brain

YOU ARE IN POSSESSION of one of the world's most powerful supercomputers, one that has virtually unlimited potential not only to change your life, but also to change your world.

This supercomputer has the ability to adapt to ever-changing environments, understand subtle patterns, and make connections between seemingly unrelated things. It can design skyscrapers, cure life-threatening illnesses, and send humans into space.

It can make you successful, rich, happy, and fulfilled . . . and it's located right inside your skull.

The supercomputer I am talking about is your brain, that miracle machine that allows you to do everything from brushing your teeth in the morning to presenting complex facts and figures to your boss in the afternoon.

Think about it: our brains have shepherded us through some pretty amazing evolutionary developments in record time. In the past 10,000 years, we've invented the wheel, built the pyramids in Egypt, discovered penicillin, developed the Internet, and sent devices of our own making beyond the outer regions of our solar system.

To put it into perspective, consider the fact that the turtle has been around for roughly 220 million years and has yet to make an innovative lifestyle improvement.

So what separates us from the turtle? The answer is: our creative brain. Our brain allows us to feel, love, think, be, and, most important, create.

You may think that creativity is a gift only certain types of people possess, like the Einsteins, Mozarts, or Shakespeares of the world. However, the latest neuroscience research suggests that creative mental functioning involves a set of specific brain activation patterns that can be amplified through conscious effort and a little practice. These are skills that anyone can master. By learning how and when to turn the volume up or down in certain parts of the brain, you can develop your creative potential to achieve greater success and life fulfillment.

In the following chapters, you'll learn about seven brain activation patterns—the CREATES brainsets. You'll see how each brainset affects the way you experience the world around you and how each contributes to the process of creative problem solving. Through entertaining exercises, you'll learn to use these brainsets to take advantage of your creative potential and enrich your life and the lives of those around you.

But the purpose of enhancing creativity is not only for enrichment; it's a vital resource for meeting the challenges and dangers, as well as the opportunities, of the accelerated-change climate of the twenty-first century.

The information and technology explosion, along with cyber-communication and globalization, is transforming the way we learn, the way we do business, and the way we form relationships with

each other. The rule books for virtually *every* aspect of human endeavor and interaction—from corporate life to personal life to dating and even parenting—are being rewritten right in the middle of the game. So if all the old bets are off, how do you survive and thrive? The most important asset you have for negotiating this rapidly changing world is *your creative brain*.

Your creative brain can lead you to discover a new and better way to manage some aspect of your business. It can help you to express your unique life experience in a way that inspires or educates others. You can use it to ensure that the best traditions of the past get incorporated into the future or to add beauty to your environment. Your creative brain can even reshape your vision of retirement so that you continue to grow and prosper throughout the decades ahead. There is truly no limit to the potential of your creative brain. . . .

Regardless of your mission for the future, it is crucial that you develop your creative capacities. By developing your creative brain, you can not only adapt to the changing world, but you can make a contribution to that change. By developing your creative brain, you will also prime your brain to discover, innovate, and produce your original contribution to what is shaping up to be a twenty-first-century Golden Age.

Before we go further, let's define exactly what we mean by that nebulous term *creativity*. Though philosophers and writers have come up with a number of definitions for *creative*, there are two elements to the definition that virtually all of us who study creativity agree need to be present in the creative idea or product. First, the creative idea or product needs to be *novel* or *original*, and second, it has to be *useful* or *adaptive* to at least a segment of the population.¹ Note, for example, that the scribbles of a toddler who has just learned to hold a crayon are *novel* . . . but, as a product, they are not considered *useful* or *adaptive*.

You can take these elements of novel/original and useful/adaptive and apply them to virtually any aspect of your life to increase your productivity and happiness. You can also apply them to the betterment of your community and to the enrichment of society. When you learn to use your creative brain more efficiently, there is no limit to the innovative ideas, products, and new ways of doing things that you can explore.

Your brain is the repository of a unique store of information: it contains autobiographical, factual, and procedural knowledge that no one else on the planet has access to. When you combine pieces of this knowledge in novel and original ways, and then take the resulting combinations and find applications for them, you are using your creative brain as it was built to be used.

Neuroimaging techniques, such as fMRI (functional magnetic resonance imaging), PET (positron emission tomography), and SPECT (single photon emission computed tomography), have allowed scientists to peek into the brains of highly creative people to see how they unconsciously manipulate their brainsets at various stages of the creative process. For example, different brainsets appear to be activated in highly creative people when they're coming up with new uses for a household item than when they're combining information from a variety of sources to find the solution to a unique problem.² The brainsets you'll become familiar with in future chapters reflect what we've learned from those studies. You'll learn:

- Strategies for accessing brainsets associated with creativity
- When in the creative process to access each of them

- And finally, how to switch easily between different brainsets to enhance your productivity and reduce creative “block”

If you're still unsure about how these brainsets can really benefit your life, then you're in good company. Two of the most common questions I hear in my seminars are these: “Isn't creativity mainly for artists, writers, and musicians?” And “What if I'm just not a creative person?” Let's address these questions right now.

“Isn't Creativity Mainly for Artists, Writers, and Musicians?”

It's true that when we think of creative individuals, we tend to think of those with careers in the arts and sciences. We think of those who have brought richness to our lives by painting a Sistine Chapel, revealing human nature through the lines of *Hamlet*, uplifting us with an “Ode to Joy,” or illuminating our night hours with the electric light. In fact, most of the formal research that's been conducted on creative individuals has concentrated on achievements in the arts and sciences because it is easy to recognize creative accomplishments in these domains of endeavor. The creative aspects of achievement in business, sports, diplomacy, and real-life problem solving are harder to recognize and quantify, but clearly they are just as important.

If you think creativity is just for artists and scientists, then consider these facts:³

- Most Fortune 500 companies and many government agencies have hired a creativity consultant within the past year. Creativity has become an important factor in the survival of businesses.
- The number of business schools offering courses in creativity has doubled in the past five years.
- Former U.K. Prime Minister Gordon Brown acknowledged that creativity and innovation are critical to the future of the U.K. economy.
- Forty-three books and 407,000 Web sites are devoted to creative parenting.
- A number of books discuss the importance of creativity in the field of sports, and the theme of the 2009 worldwide conference of the European Network of Academic Sports was “Creativity and Innovation in University Sport.”
- Creative athletes, such as Michael Jordan, Roger Bannister, Bill Russell, and—yes—Tiger Woods, often possess personality traits that are found in highly creative individuals in the arts and sciences.

Let's look at a couple of examples of how creativity can serve you in areas of your life that have nothing to do with art, music, or science.

First, in the domain of business, the economic downturn of the past several years has hit small businesses, large corporations, and individual contractors. If your business is going to fight the uphill battle of survival, you need to find creative ways to cut costs while maintaining quality, provide an innovative product or service rather than the same old product that your competitors are providing, and invent ways to create or maintain market share.

If your business has already succumbed to the economic downturn, you need to be creative in reinventing your professional life, whether it's using skills you already possess to market yourself

or developing a new set of skills to enter an entirely new business or profession. Reinventing your professional life takes creativity and courage. But it can be one of the most rewarding enterprises of your life.

Second, in the domain of family you may be one of millions of parents who are faced with the dilemma of how to pass on family values to children who live more harried lives than most adults did just a generation ago. How do you communicate with a child who, despite your best efforts, is wired 24/7 to an iPod, Facebook, IM, and Grand Theft Auto? How do you impart a sense of balance to a child who is constantly bombarded by media that equate self-worth with anorexic thinness, pleasing a man in bed, or having the athletic prowess of a superhero? You *can* do it—but as a parent, you need every ounce of creativity you can muster to compete with electronic gadgets and today’s sensationalized media agenda for your child’s attention and subsequent welfare.

Speaking of which, how do you keep *yourself* balanced when there are so many demands on your time and personal resources? To maintain your energy—and your sanity—you need to find creative ways to manage your time so that you can juggle the demands of modern existence while still ensuring that your hours and days remain rich and meaningful.

In short, creativity is important for artists, writers, musicians, and inventors; but it is also crucial for societies, businesses, and individuals who need to juggle fulfillment with the demands of the rapid-change culture. You not only need to be creative to enhance your life, you also need to be creative to survive.

“What if I’m Just Not a Creative Person?”

We are all creative. Creativity is the hallmark human capacity that has allowed us to survive thus far. Our brains are wired to be creative, and the only thing stopping you from expressing the creativity that is your birthright is your belief that there are creative people and uncreative people and that you fall in that second category.

Think back to the last conversation in which you participated. Think about what you said. Notice how you pulled selected words representing specific objects, situations, or actions from your memory store and combined them in a novel, never-before-spoken order (unless you work from some sort of talking points sheet) to convey meaning to your listener. The fact is that if you’ve done nothing but speak in this life, you have demonstrated your creativity over and over again. Each time we speak we put words together in a novel and original way that is useful for our purposes—the essence of creativity!

But of course you do more than speak. You are a creative problem solver. Take a minute to think of the last time you solved a minor problem in your life without an instruction manual. I guarantee you’ve already done such creative problem solving once or twice just today. How about the last time you used a household item for a purpose other than the one for which you bought it? Examples: using a piece of furniture or a box to hold a door open, using a newspaper to cover your head in a sudden rain shower, or using an empty soup can to water flowers. Finding alternate uses for items is indeed a creative act.

If you’ve planted a garden, arranged the furniture in your living room or office, deviated from a

recipe, driven a new route to the shopping mall, or figured out how to calm a crying child, you've demonstrated your creativity. The truth is that *every day* you perform *hundreds* of creative acts. Take a moment to think of what you did yesterday and count how many acts were unscripted improvisations, how many problems you encountered and solved (including picking out your clothes, deciding what to eat, how to put out work-related or family-related fires); don't compare yourself to others, just think about your own creative acts . . . and revel in the wonder of your creative brain.

Creativity is *not* an elite activity. And it doesn't matter if you don't gravitate toward traditionally creative professions or activities; you can bring creativity to any endeavor and make it more successful. You *are* creative!

Here's one final incentive to exercise your creative brain: being creative makes you more attractive to the opposite sex (really).

According to evolutionary psychologist Geoffrey Miller, individuals who can use their creative talents successfully to form new adaptive ways of doing things are more likely to survive. As such, creativity is a "fitness indicator" and will, therefore, be attractive to potential sexual mates. Miller suggests that certain human-specific creative endeavors, such as music production, artistic creations, and humor, may have evolved partially to advertise creative fitness to potential mates similar to the way that the peacocks evolved elaborate tail displays or that bowerbirds build colorful nests.⁴

Intuitively, it does seem that we find individuals who sing, write novels or poetry, or who create art or build inventions to be sexually attractive (how else do you explain the female attraction to Mick Jagger?). This intuition is actually backed up with some empirical evidence. Evolutionary psychologists David Buss and Michael Barnes studied mate selection preferences in both married couples and unmarried college undergrads.⁵ For the married couples, *artistic-intelligent* was the third most sought-after trait in a long-term mate (after *kind* and *socially exciting*). For both male and female undergraduates, creativity ranked in the top 10 desirable characteristics for a long-term mate (less important than *physically attractive* but more important than *good earning capacity*).

So far, here's what we've established:

- Using your creative brain is crucial for adapting to the fast-changing climate of the twenty-first century.
- Creativity is not just for artists, poets, and musicians.
- *You* are creative.
- Creative behavior is sexy.

In the next chapter, you'll be introduced to the CREATES brainsets, and you'll take a fun quiz to determine which brainset defines your personal Mental Comfort Zone. Your creative brain has the capacity to make you successful, however you gauge success. By using the brainsets in the following chapters, you'll optimize this capacity.

Notes

¹. The definition of creativity accepted by most researchers is found in Frank Barron's classic book on creativity: *Creative Person and Creative Process*. See Barron (1969).

[2.](#) A set of studies conducted by Colin Martindale at the University of Maine suggested that people who were categorized as highly creative demonstrated different brain activation patterns when solving two different types of problems (divergent versus convergent problems—you’ll learn more about these in Chapter Seven), while people who were rated as less creative tended to display the same brain activation patterns when trying to solve both types of problems. These studies indicate that people who use their creative thinking skills change between brain activation patterns more easily than those who have less-developed creative thinking skills. A review of these studies is found in Martindale (1999).

[3.](#) For information on creativity and business schools, see Gangemi (2006). Gordon Brown’s comments come from a talk given at the Innovation Edge conference in London, on March 10, 2009, sponsored by the National Endowment for Science, Technology and the Arts (NESTA). You can access the speech at [[link:www.nesta.org.uk/assets/external_video/public_services_innovation_summit__gordon_brown](http://www.nesta.org.uk/assets/external_video/public_services_innovation_summit__gordon_brown)]. Information on creative parenting comes from Google and [[link:Amazon.com](http://Amazon.com)] searches conducted on February 5, 2009. For information on the sports conference, see ENAS conference bulletin available at [[link:www.enas-sport.net/SysBilder/enas_File/Congress_2009_160609.pdf](http://www.enas-sport.net/SysBilder/enas_File/Congress_2009_160609.pdf)]. For information on sports figures and creative achievers, see Colvin (2008).

[4.](#) For more information on the theory of how creativity is a “fitness indicator” and thus makes an individual attractive to potential mates, see Miller (2000) and Miller (2001).

[5.](#) For the Buss and Barnes study, see Buss and Barnes (1986). For more information on the evolutionary theory of mate selection, see David Buss’s book: Buss (2003). For differences between the sexes in human mate selection, see Buss (1989). Also see Nettle and Clegg (2006).

Your Mental Comfort Zone

SCENARIO: YOU'VE BEEN CHARGED with coming up with a theme for a fund-raising event for your community organization. Take a moment to determine which of the following strategies will be most helpful for you as you choose an appropriate yet compelling and novel theme:

- a. You scan newspapers and magazines for events to determine which themes have been used by other organizations.
- b. You think of the qualities and characteristics of your organization and consciously, through trial and error, focus in turn on how each of those qualities might be used in a theme.
- c. You absorb information about local events, you go to a party store and look around, you look through some historical **[End of Sample]**