
Introduction

When Corwin Press notified us regarding the need to revise *Building the Reading Brain*, we knew there was no denying the proliferation of information available about the wonders of the reading brain since the original publication. As the revision was underway, it was simply too easy to infuse new information with the strong, vital concepts from the first edition. Although the original book can still stand on its own for its bold message, it is lacking in current research that extends understanding and forcefully addresses teaching decisions and practices vital for children to learn to read and learn to read well.

The previous and new reader of this book is directed to what is different about the second edition through a series of specific examples. First, every reader will notice the introductory summary at the onset of each chapter. This summation allows readers to capsule the chapter's information to determine the depth with which to read the chapter, peruse for later in-depth reading while going directly to the needed information in another chapter, or to share information with colleagues in a study group. The reader will notice the updated and impressive current research supporting the mainstream threads throughout the chapters for best methods and practices for teaching and their validation from neuroscience. Included in this edition, also, is information about neurons, the brain's nerve cells and work crew. An exciting, relatively new discovery, mirror neurons, is investigated for the vital role in the learning process these neurons play beginning at birth. Another addition features the decoding reading pathway. Notice the specification that the pathway is for decoding; there are other structures involved when we talk about reading comprehension, vocabulary development, or reading fluency. Recent studies using functional magnetic resonance imaging validate the importance of visual association (note visual, not auditory, areas), which are activated for advanced readers as they fluently traverse through a written passage. So while our originally defined pathways are still valid, they are now

enhanced with additional areas of the brain supporting the reading process as it moves from simply identifying words to magnificently knowing words for their meaning.

A fifth area of expansion involves a look at sensory input into a child's brain. We look at expanded channels for information input and challenge teachers to check for understanding through a multiplicity of output products. Coupled with input and output channels, we turn to motivation to learn. Boldly, we state that teachers cannot make children learn. Children must be motivated to learn and willing to participate in the learning process with deep concentration. Readers will have some fun with this area and others that make teaching (according to the standards) exciting and captivating. Thinking about ways to motivate learners, what about children who are English learners? Yes, this edition has expanded information about our children who must become fluent English speakers. Surprise! They need to be engaged with language. Teacher talk and tell does not lead to language learning for their students.

Interestingly, Response to Intervention (RTI) is now common school campus vernacular. When the first edition of this book was printed, we referred to school level assessment teams, and Tier 1, 2, and 3 levels of intervention. Now this process is actualized by well-accepted RTI practices. Chapter 7 continues to have ways for doing RTI as well as current neuroscience research to validate the work of our schools. Simply put, most children who struggle with reading are not disabled. They have physiologically inadequate connections for the structures of the brain that can ensure successful reading. It is RTI practices, for the most part through general education programs, that force efficient reading pathways to emerge for use. And what is new about eye movements during automatic fluent reading? Scientists provide us with an astounding new look at how reader's eyes operate to provide the child's brain with the necessary information to read with understanding.

Finally, there is a plea to consider teaching outside the traditional curriculum and physical setting. Chapter 7 grapples with traditional teaching and the inferred benefits of expanded ways and places to reach a higher potential of the human brain. The statement, "We only use 10 percent of our brains," is simply not true. We use all areas of our brains, but to what percentage of our potential do we use this marvelous organ? It is intriguing to consider movement beyond our static way of looking at education.

The original purpose in writing this book was to bring to the field of developing literacy a focus that has become possible only through developments in neuroscience. Thus began the ambitious task to align new developments in neuroscience with the reading process. It is our hope that this work will continue to provide parents and educators with a better understanding of the ways they can help to leverage reading success.

First, chapters focus on the role of parents and caregivers as they work together with young children to build that most ancient and fundamental human communication bridge—spoken language. We offer parents and

caregivers ways to build on children's natural proclivity for speech and to begin to nurture them in an appreciation and understanding of language, print, and books to support the process whereby children move from spoken language to understanding symbolic written language.

Next, by examining the neurobiology of language and the scaffolding it provides for the cognitive processes of reading, we hope to help educators use the best of what we know of how the brain learns and merge it with what we know from reading experts about the best reading instructional practices.

Looking through the new clarifying lens of brain imaging, we see how some children experience greater challenge in becoming readers, and we look at possible appropriate interventions for these children. From what we know of the brain, we have drawn conclusions about applications for classroom instructional decisions and practices that are in line with how the brain learns, how teachers can help to build the reading brain, and how they can differentiate instruction for struggling readers.

For the benefit of those people who work to ensure reading success—parents and families, caregivers for young children, nursery school teachers, preservice and in-service primary teachers, faculty study groups, staff developers, literacy coaches, and school leaders—this book is provided. To facilitate reflection, discussion, and application of the ideas offered, reflection prompts are included at the end of each chapter.

The chapters of this book are arranged to look chronologically at language and reading development. Parents, early caregivers, and teachers may choose to begin reading where they expect immediate application to their situations. However, note that Chapter 2, with its overview of how the brain processes language and reading, is particularly important as it provides a physiological foundation for the rest of the book.

Chapter 1 provides an introduction to the reading process and explains why reading is an “unnatural” act. It discusses the factors that influence whether or not children will become fluent readers. In Chapter 2, the authors explore the neurological processes involved in learning to read. The oral language pathway, which is hardwired in the brain at birth, provides the foundation for building the reading decoding pathway. However, some children's brains are hindered from making the transition from language to reading. This chapter includes a discussion of the biological and environmental causes of reading difficulties.

Because the brain uses the innate language pathway to learn to read, the development of language is an essential precursor to reading. Chapter 3 looks at how parents and caregivers can encourage and enhance oral language in their children from birth to age 3. It explains why reading to children and teaching them nursery rhymes helps to build the brain structures children will need in order to read. Chapter 4 continues this discussion with a focus on emergent literacy in preschool children. Discussed are developmentally appropriate activities and methods for continuing oral language development.

As children enter school, they are expected to be able to focus their attention on tasks that involve interpretation and the production of symbols from our oral language system. In Chapter 5, preparation for school tasks are identified as priming skills. Beyond the skills of attending and concentrating, the chapter provides a description of memory systems and concludes with rational and practical activities to maintain student motivation and to develop organizational skills. The kindergarten and first-grade child are the focus of Chapter 6. Here, the authors identify phonological processes and manipulations to reshape neural pathways in the brain for the oral reading process.

Primary-age children's brains are malleable and plastic; they are more open to learning than at any other time during formal education. When a child is not successful with school tasks for reading, early intervention is critical.

Chapter 7 identifies assessment and intervention issues for struggling readers. Comprehension and vocabulary development with a focus on second-grade children forms the essence of Chapter 8. The authors provide a discussion of what teachers can do to help children build extensive vocabularies, expand informational chunks for memory, and form connections among thoughts and concepts in novel and exciting ways.

Chapter 9 pulls all reading skills together with a focus on fluency. Fluency, as defined in this chapter, is observed when a child is able to read out loud with automaticity and comprehension. Fluent readers demonstrate speed, accuracy, and proper expression while they concentrate on meaning. Building the reading brain, a construction process for the school years, is finalized in Chapter 10. A 12-point list from the book's content provides a conclusive summary. Finally, it is acknowledged that it takes talented teachers, who understand how children learn to read, to orchestrate a delicate balance of instruction, student engagement, conversation, and reading practice so their students are able to read with a natural amount of effort and with obvious enjoyment.