



Healing at the Speed of Sound

*How What We Hear Transforms Our Brains and Our Lives
From Music to Silence and Everything in Between*

By Don Campbell, author of *The Mozart Effect* and
Alex Doman, Founder of *Advanced Brain Technologies*

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Based on over a decade of new research, Don Campbell, bestselling author of *The Mozart Effect*®, and Alex Doman, an expert in the practical application of sound and listening, show how we can use music—and silence—to become more efficient, and productive, relaxed, and healthy.

Each chapter focuses on a single aspect of everyday life, providing advice, exercises, wide-ranging playlists, and links so readers can combine the music they love with new styles to create the perfect soundtrack for any goals or task. Also included are “Sound Profiles”—brief stories illustrating how real individuals relatively tap the power of sound to improve their own and others’ lives.

Inspiring, practical, and truly enjoyable, *Healing at the Speed of Sound* opens the door to a fuller, richer, and much more harmonious life.

- *The Mozart Effect* and *The Mozart Effect for Children* have sold hundreds of thousands of copies. Don Campbell has written more than 20 books, which have been translated into many languages.
- Alex Doman’s network of clients includes more than 5K trained education and healthcare providers.
- As an added bonus, there will be an enhanced eBook edition of *Healing at the Speed of Sound* that will be released at the same time as the print edition. It will serve as an immersive experience for readers, with more than 70 active links that lead to audio and video supplements, free music downloads, and more!

Available: September 29, 2011 Format: 6" x 9"; Hardcover; 288 pages BOOK: ISBN: 978-1-59463-082-8 - USA \$25.95 - CAN \$30.00 EBOOK: ASIN: B0052RHBTE - \$12.99	Available: October 30, 2012 Format: 7.9" x 5.2"; Paperback; 288 pages BOOK: ISBN: 0452298555 - USA \$16.00
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ABOUT THE AUTHORS



Alex Doman is an author and producer whose products are used by people in more than 35 countries. His work is based on music effects research and principles of human development and neuroplasticity focusing on improving academic, cognitive, and communication abilities. He is founder and CEO of Advanced Brain Technologies, a leading provider of products, which improve sound brain fitness with solutions for consumers, schools, therapy clinics, health care facilities, and the military.

Creator and co-producer of the multi award winning Music for Babies™ music collection and collaborator on more than 50 other albums and programs including the Sound Health® series, The Listening Program®, and Music for the Mind™. He has trained thousands of healthcare, education, and music professionals in the application of music-based products around the world. Alex has lectured throughout the United States, Europe, Australia, Latin America and the Middle East.



Don Campbell is a leading lecturer and consultant to healthcare organizations as well as corporations and parenting groups. He works with audiences of symphony orchestras on how music can affect learning, health, and other aspects of our lives. He is Acoustic and Musical Director of Aesthetic Audio Systems, an innovative company that provides quality music to healthcare facilities and has served for the past ten years on the Board of the American Music Research Center at the University of Colorado. In 2006, he was honored as "Signature Sinfonian" with the Award for Outstanding Service to Music and Education from Phi Mu Alpha Sinfonia

Fraternity. He has also been awarded "Director Emeritus" of the Boulder Philharmonic Orchestra and now provides the pre-concert lecture series and directs the SuperListening™ Club.

Author of 23 books including Music: Physician for Times to Come, The Harmony of Health, and the 1997 best-seller, The Mozart Effect®, Mr. Campbell has lectured in over 25 countries. He has also produced 16 albums, including the accompanying music for the Mozart Effect series for adults and children, which dominated the classical Billboard charts in 1998 and 1999.

In Campbell's unique view, music is not only a rich and rewarding aesthetic experience, but also an easily accessible bridge to a more creative, intelligent, healthy, and joy-filled life. His singular mission is to help return music to its central place in the modern world, as a resource for growth, development, health, and celebration.

ENDORSEMENTS

"As you read and apply what you learn in *Healing at the Speed of Sound* you will transform your life. Alex Doman and Don Campbell unveil practical and profound insights for attaining health and well-being. This remarkable read changes how you think about sound and music, and teaches you how to harness their power to achieve your highest aspirations."

Kevin Hall

Bestselling author of *Aspire: Discovering Your Purpose through the Power of Words*

"We now have a powerful and comprehensive science-based reference supporting what we have long suspected, that sound and music have incredibly powerful effects upon human physiology. *Healing at the Speed of Sound* brings clarity and applicability to the extensive research in the field and provides us with powerful tools to enhance our general health and wellbeing as well as expand our spiritual awareness."

David Perlmutter, MD, FACN, ABIHM

Author of *Power Up Your Brain: The Neuroscience of Enlightenment*

"From the moment of our birth, or perhaps even conception, to the last breath we take, sound is a primary, shaping force in our lives. Don Campbell and Alex Doman have authored a wonderful treatise helping us understand the role sound plays in our lives and the means by which we can be productive, healthy and happy."

Sam Goldstein, Ph.D.

Author of *Power of Resilience*

"Most everyone agrees vibrations, sounds, rhythms and music are good for our mental, physical, emotional and spiritual health! Thanks to world renown music journalist Don Campbell and brain specialist Alex Doman, we now have infinite ways to transform, heal and enhance our lives with *musical prescriptions*. Not just a book of inspiration and creativity but this is the most contemporary resource of recordings, podcasts, and invaluable insights and studies. *Healing at the Speed of Sound* puts us in charge of our own sound health and well-being. Life is good-but it can be so much better with Campbell's infinite illuminations contained in this wonderful body of work."

Barry Green

Bestselling author of *The Inner Game of Music*, *The Mastery of Music*,
Bringing Music to Life

Healing at the Speed of Sound

Health

- Sonic Makeover - Improve your listening, improve your life
- Listening disabilities, a growing epidemic
- How well do the sounds in the morning serve you as you begin your day?
- What are the right sounds for you to start your day? When you change the way you start your day, you change ALL your days!
- Behavior Change
- Daily Symphony of Healthy Sound
- How to get the most out of your exercise routine
- Is noise a threat to human health?
 - Alzheimer's disease and what you can do
- Hearing and Brain Fitness
- How music can improve brain fitness.
- How to use sound in positive ways to relieve pain, manage health conditions, decrease anxiety before surgery, speed recovery & enhance physical rehabilitation.
 - Depression, PTSD
 - Soldiers – Can sound brain training help PTSD?
- What's the ringing in your ear? Tinnitus. Have you heard about Tinnitus Retraining Therapy? It worked for William Shatner!
- What's the right music for you when in the hospital, or with a specific disease?
- Music Therapists and their role in using sound as a healing tool.
 - How to improve your relationships, concentration, focus, organization at home, and on the job
- Using Music, Voice and Rhythm to manage auto immune diseases, allergies, eczema, arthritis, AIDS, and Cancer.
- What kind of music might save you in an accident or severe illness? How to choosing three music selections to take with you to the hospital.
- Aging? Losing memory? Mental sharpness fading? What music should you be listening to?
- Parkinson's and music therapy.
- Ways to use the power of rhythm, vibration, melody and tone to sharpen our minds, keep ourselves active, and mitigate the effect of illness and other challenges of aging.
- Did you know the brain does not stop growing in our later years!
- Soothing music helps patients of all ages endure stress inducing or painful medical tests.
 - You hear about making good food choices, exercise choices, but what about good sound choices? Is it just as important in the whole scheme of your health? YES!

Elderly / Aging

- Communicating with an elderly loved one through music. Connecting through music can literally save their life. Learn how to use music for a happier, healthier and longer life.
- Maintaining sound brain fitness in the elderly

Parents / Child / Teen

- Soothe a high strung child with music
- Poor Sleeper? Not if you use the correct music and sounds in the daily life of your baby and toddler.
- Baroque music of Bach and Vivaldi is optimal for attention and learning.
- Music that fosters better concentration while children do their homework. NO more struggles for Mom and Dad!
 - Child difficult, unmotivated, hyper, lacks focus? What if I told you sound could make all the difference?
- Music to feed, change, soothe your baby
- Playing an instrument improves learning, grades, SATS, grey matter!
- Is the sound volume on your child's toys causing hearing damage?
- The crisis of creativity in children not being nurtured.
- Music and Teens. Your teen's choices in music and how to embrace their music tastes.
- Singing to your child to relieve pain.
 - Teen – Are you connected to your teen? Music may be the key to that connection
- Are we raising a generation of deaf kids?
- Teenagers and ear buds
- Why Johnny doesn't get it. His brain does not understand what it hears
- Why you should buy your teen the best headphones

Career / Work

- How a well-designed soundscape can decrease fatigue, increase productivity, put clients at ease, and improve your own and other's morale in the workplace
- Learn how to "orchestrate" employee morale, productivity, and customer satisfaction.
- Sound solutions to prevent employee burnout
- Are your employees good listeners?

Healthy Sound Environment / Home / Sound

- Using the Four Sonic Tools to create a more serene and healthy ambience in your home:
 1. Entrainment
 2. Iso-Principle
 3. Masking
 4. Diversion

- What does your “tone” of voice convey? Openness and excitement, or criticism and negativity?
- Science of hearing and how it’s linked together
 - How do people listen?
 - Noise level in your life? What’s it’s doing to you and your/families mental fitness?
 - Music can be more impactful than drugs, specifically anti-depressants
 - How music connects us to each other: family, community, and the world.
 - Is your city too noisy? Does it exceed health levels?
 - Travel Take Away – Use headphones to block the “Noise”
 - What to consider/think about when you travel (on a plane) sound-wise
 - Proper listening for sound fitness—buds vs. earphones

Enhanced eBook Ideas/Multi Media Aspect of the book

- The eBook edition of *Healing at the Speed of Sound* is an immersive experience for readers. It has over seventy active links that lead to audio and video supplements, free music downloads and more!

Technology

- How enhanced eBooks help readers understand the book material better.
- What does “Enhanced” eBook mean to us as readers?
- Will this change the way our children learn in the classroom or at home? What are the pros and cons?

Pregnancy

- Why it’s best to use bone conducting headphones during pregnancy instead of music-delivering devices that are placed directly on the belly.
- Creating a sound diet for mom’s-to-be

Taken from *Healing at the Speed of Sound*, by Don Campbell and Alex Doman.
Published by Hudson Street Press (September 29, 2011).

Music of Life

How Our Earliest Development of Hearing and Speech
Leads to a Lifetime of Sound

Before we make music, music makes us.

— Joachim- Ernst Berendt, *The Third Ear*

Now that you have begun to replace the noise in your environment with more nourishing sounds, let's pause to take a closer look at the ways in which your physical, emotional, and intellectual development have been profoundly affected by sound's physical properties— rhythm, pitch, and frequency or vibration— from your earliest days of life. Your manner of speaking, of walking, of interacting with others socially and emotionally— your ability to really hear what others are saying to you, to focus on tasks, and to stick to your goals until you have achieved them— all of these aspects of your personality and demeanor have been shaped to some degree by your interactions with sound. In a very real sense, throughout childhood, adolescence, and adulthood, sound has made you what you are today.

In recent years, a wave of new research, powered by new technology and diagnostic techniques, has provided us with fascinating glimpses of the specific ways in which this process works. Studies conducted around the world have demonstrated how sound's energy shapes the brain's development before birth; how its rhythms regulate our physical movements; how pitch, tone, and musical structure can fine-tune the mind and sharpen listening skills; how music making improves students' test scores and communication skills; and how professional musicians' brains actually differ in structure from the brains of non-musicians. The conclusion reached by British and American

scientists at the “Musical Brain” conference at London’s Royal Institution in 2001— a gathering marking the culmination of the 1990s’ “Decade of the Brain”—was that, far more than just a cultural phenomenon, music is “a biological fact of human life” intimately involved in our physiological functions. In this chapter, we will examine that research and consider how these findings can improve your life and the growth and development of those around you.

Overture

The music of your life began with a heartbeat. From the moment you acquired the ability to process sound in your mother’s womb— sometime during the second trimester of your development— the steady thump of her beating heart permeated your developing body and brain, imprinting its rhythm over and over, millions of times before your birth. Other sounds washed around you too— the loud, constant rush of blood flowing through the placenta, the gurgling sounds of digestion, the comforting vibration of your mother’s voice resonating through her body and yours.

From outside, the novel sound patterns of human laughter, conversation, traffic, machinery, and music permeated the wall of the womb and were transmitted to your ears through the amniotic fluid, though their frequencies were filtered and you, immersed in liquid, heard only muffled sounds.

Penn State neuroscientist Rick Gilmore suggests that, as a result, the voices of your family members probably sounded like “the squawk of the muted brass instrument that depicts grown- ups talking in the animated *Peanuts* cartoons.” Nevertheless, “there is a lot of information in that filtered and muted sound stream.”

As parents have long known, the fetus responds easily and frequently to sound in the environment, particularly during the final trimester. Pregnant musicians have reported feeling their unborn children kick in time to the music they play— sometimes even stopping and starting as the music stops and resumes. Writer and radio host Al Letson tells of the nights in bed when he and his unborn daughter exchanged kicks and gentle pokes through the wall of her sleeping mother’s stomach— a rhythmic

communication that laid the groundwork for an intense connection between them once his daughter was born. For decades, scientists have routinely documented such fetal responses to loud sounds, in the form of startled responses and increased heart rate. The fact that babies can hear outside sounds is indisputable. The more interesting question is whether the fetus *understands* these sounds in any sense. When you heard music or your mother's voice, did you actively *listen*, and did those sounds carry meaning for you? Did they affect the development of your brain and body? And following birth were you able to remember them?

In fact, the depth and range of the fetus's sensation is far greater than most of us realize. The developing brain perceives through contrast. A sudden change in sensory stimulation—the sound of laughter, say, mixing with the background sounds of your mother's body—told your fetal brain that something new had happened. When this stimulation entered your auditory cortex, your brain responded with a sharp “What's that?”—and went to work trying to connect the sound with past experiences and fit it into a developing pattern of understanding. Your brain was not simply registering sound, in other words, but was actively trying to make sense of it. And as it fit together the pieces of the sound puzzle of the world outside, these patterns were mirrored in its own development. With each new sound pattern, new neurological pathways were carved, like grooves in a vinyl record.

Researchers have traced this process in a number of ways. Their studies show that the fetus not only senses sound from outside the mother's body, but it differentiates between novel and familiar sounds, responding physically to new sounds while growing indifferent or habituated to those that are repeated consistently. This recognition of the familiar, in which the fetal brain stops responding to an often-repeated sound with “What's that?” represents the first form of learning.

The fetus is capable of remembering what it has learned as well. In one well-known study, researchers directed a quiet vibratory sound toward the mother's abdomen, followed by a loud sound. The first time this was done, the fetus did not respond to the gentle stimulus, but did respond to the succeeding jarring sound. When the sequence was repeated, however, the fetus responded to the quiet sound, as though remembering the sound pattern and anticipating the loud stimulus to follow.

Your brain's search for patterns and its sensitivity to sound contrasts allowed you to learn and remember the cadence and inflections of your mother's voice before you ever left the womb. While still in utero, you could distinguish between her language and a foreign tongue, probably due to the differences in rhythm. The downbeat in spoken language is "like an edge finder, or the boundary of rhythm" for the fetus, explains Ann Senghas, a psychologist at Barnard College, in New York. At the same time, as studies have shown, your neurons learned to prioritize some sounds. When a sound became important— when your mother's singing to you during pregnancy, for instance, increased the levels of positive hormones in her blood, which in turn nourished you— your cells' response to that tone increased. Your brain learned to respond strongly to her singing as a source of pleasure— the beginning of the lovely mother- infant bonding process that continued after birth, and one reason why your mother's lullabies could so effectively soothe you and help you drift toward sleep.

Developing human brains seem particularly attuned to music— even more than to language— no doubt due to its structural complexity and interesting patterns. A song does not have to be beautiful, or even directed at the fetus, to be remembered after the baby is born. Infants often recognize and respond to the theme songs of television shows their mothers watched most while pregnant, for example. Just as certain foods are more nourishing than others, however, even if all types provide calories, high quality classical, world, and other complex instrumental and vocal selections provide broader and more varied stimulation to the fetus than the typical theme song or simple pop tune.
