THE ORFF ECHO

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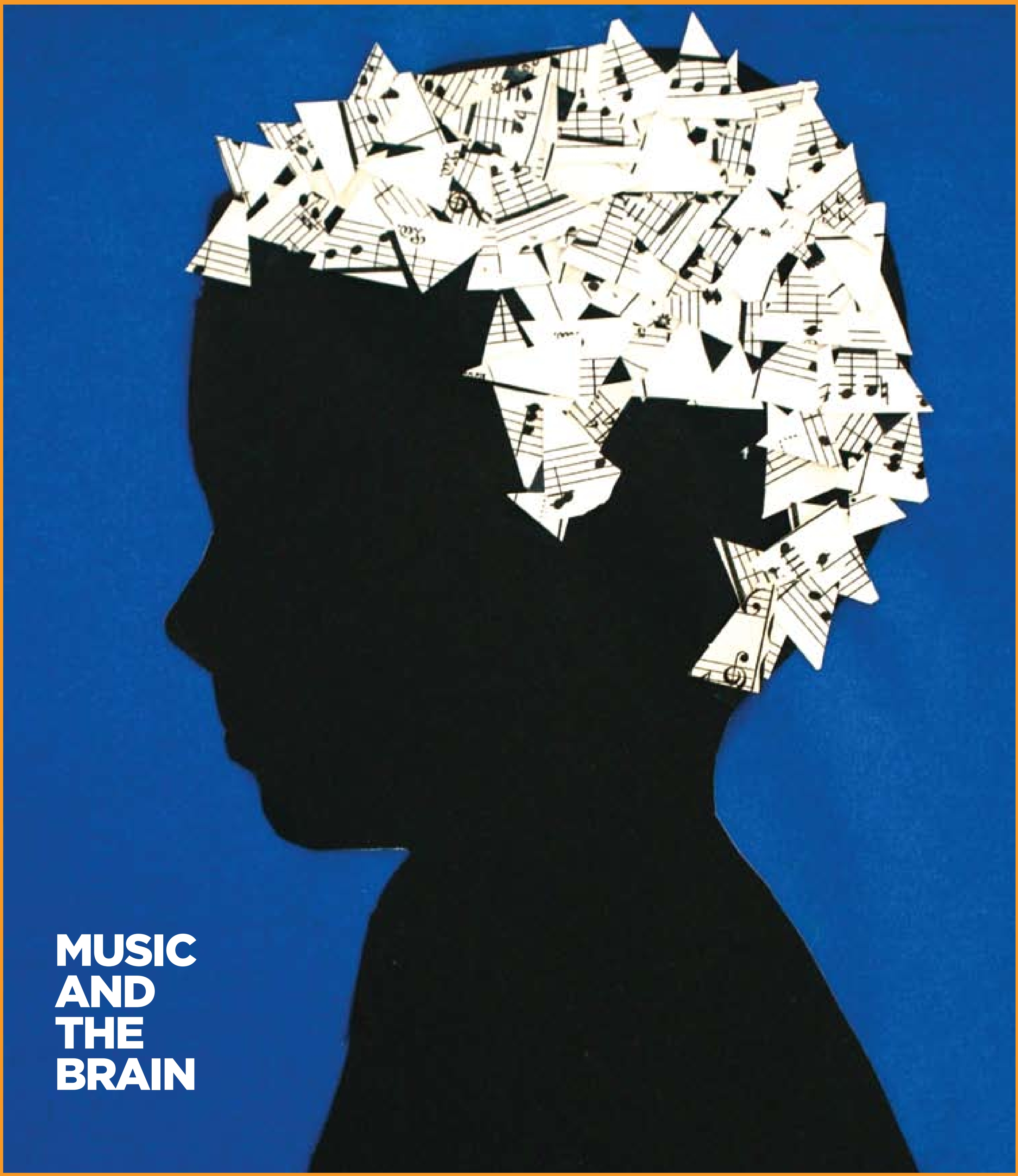

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THE ORFF ECHO

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Issue Coordinators:
Carlos Abril
Pam Hetrick

Cover Art:
By Michael McMahon, fifth grade student at Richards School in Whitefish Bay, Wisconsin.
Art teacher: Janann Miller

The Brain and Music

FEATURES

FOCUS ON RESEARCH

DEPARTMENTS

IN REVIEW

American Orff-Schulwerk Association

Music and Movement Education P.O. Box 391089, Cleveland, OH 44139-8089
(440) 543-5366; FAX: (440) 543-2687; E-mail: info@aosa.org
Web site: http://www.aosa.org
Affiliate of MENC: The National Association for Music Education

The American Orff-Schulwerk Association is a professional organization dedicated to the creative teaching approach developed by Carl Orff and Gunild Keetman. We are united by our belief that music and movement—to speak, sing and play; to listen and understand; to move and create—should be an active and joyful experience.

Our mission is:

- to demonstrate and promote the value of Orff Schulwerk;
- to support professional development opportunities; and
- to align applications of the Orff Schulwerk approach with the changing needs of American society.

Editorial Calendar

Issue	Topic	Coordinator(s)	Contributor's Deadline
Fall 2010	Music We Bring into the Classroom: The Volumes	Judith Cole Carol McDowell	April 1, 2010
Winter 2011	Music We Bring into the Classroom: Folk Music	Martha O'Hehir Carlos Abril, Nick Wild	July 1, 2010
Spring 2011	Music We Bring Into the Classroom: Jazz and Blues	David Thaxton	Oct. 1, 2010
Summer 2011	Music We Bring Into the Classroom: Popular Music	TBD	Feb. 1, 2011

Writer's guidelines available through the Editorial Office

We seek articles on these topics as they relate to Orff Schulwerk or to broader areas of teaching and learning. Editing and production is in process for some articles one year ahead of the publication date. If one of these topics appeals to you, please contact the appropriate editorial coordinator soon. Also, articles on topics other than those listed above may be considered at any time. Before submitting manuscripts, please contact the editor for a copy of editorial guidelines. We cannot guarantee the publication of any submitted material. *The Orff Echo* makes every effort to trace ownership of copyrighted materials and to secure permission from copyright holders. If there is a question regarding ownership of any material, we will be pleased to make the necessary corrections in an upcoming issue.

For guidelines or other editorial queries, please contact: echoeditor@aosa.org

BY JULIE SCOTT

The "Echo" Lives On

Do you know how *The Orff Echo* got its name? I have a good guess. In Volume 3 of his autobiography titled *The Schulwerk*, Carl Orff details how, after World War II, the ideas of his Schulwerk had become a thing of the past. Its ideas had been deemed undesirable by the Nazi regime. The Güntherschule, along with its entire inventory, had been bombed and destroyed in January 1945.[1]

In 1948, a call came from Dr. Walter Panofsky, Carl Orff's friend and colleague, who worked for Bayerischen Rundfunk (Bavarian Radio). Dr. Panofsky had found a recording of the music Orff had composed for the 1936 Olympics ("Einzug und Reigen") and inquired whether Orff would be interested in writing more music such as that, which children could play for a series of radio broadcasts. These programs would be sent out "to hundreds of schools for thousands of children" to serve as models for music making for children and teachers throughout Bavaria.[2]

By the time the call from Dr. Panofsky came, Carl Orff had moved on to pursuits unrelated to the education of children. (His work on *Antigone* had begun in 1948.) However, Orff was intrigued by the idea of "music exclusively for children that could be played, sung, and danced by them but that could also in a similar way be invented by them," and his interest in music for children resurfaced.[3] Orff accepted Panofsky's offer, and he worked with Gunild Keetman to plan the material for a group of eight- to twelve-year-old children, along with a narrator.

> The "echo" was a true representation of the "feedback" that resonated with the United States.

THE "ECHO" OF ORFF SCHULWERK

With regard to the beginnings of the broadcasts, Orff quoted Panofsky as writing:

> On September 15, 1948, the first Schulwerk programs were broadcast over the air from Munich. No one had any idea of the kind of *echo*[4] they might arouse…
>
> Annemarie Schambeck had received fourteen programs proposed by Orff, she had decided to present them even if there was no *echo*, or perhaps even strong opposition from the schools. It showed how crucial it was that the independent, non-educational institution made Schulwerk its own. Had it been started by a single school it would have taken a long time to reach the outside world; through the radio it could spread over the whole region. The *echo* was, from the beginning, surprisingly large, and it increased with every program. (italics added.)

Orff continued, "It was soon clear that it would not rest with the planned few broadcasts, but that this was the seed of a development that could not yet be seen."[5]

ECHO: CALLING OUT

The "echo" certainly didn't rest there. The seeds spread throughout the region, across the ocean to Canada and to the United States, where the founding members of AOSA, and other early members, sent out a clear message that Orff Schulwerk was relevant and timely. The "echo" was a beautifully chosen title for the journal of the American Orff-Schulwerk Association. It was a true representation of the "feedback" that resonated with the United States.

REVERBERATIONS: CALLING BACK

Reverberations, the aptly named newsletter of AOSA, could be analogous to the second generation of AOSA members. This group of teachers emulated the teaching and ideals of their instructors, while also making the Schulwerk their own.

RE-ECHOES: THE NEW GENERATION

The new generation of AOSA members is just beginning to take on leadership responsibilities in AOSA and in Orff Schulwerk. Jo Ella Hug, past president and honorary member of AOSA, shared with me that she has a tradition of gifting an AOSA membership to a new teacher who has shown a "spark" for Orff Schulwerk. What a wonderful way to encourage and nurture a new teacher.

AND THE BEAT GOES ON...

I am always excited to see many university students at our conferences. In addition, the Alliance for Active Music Making (Judy Bond, past chair) is working to advance the teaching of the active music-making approaches, including Orff Schulwerk, to college students. Once they see for themselves

CONTINUED ON PAGE 24

A Special Issue on Music and the Brain

BY PAM HETRICK

The noblest pleasure is the joy of understanding.

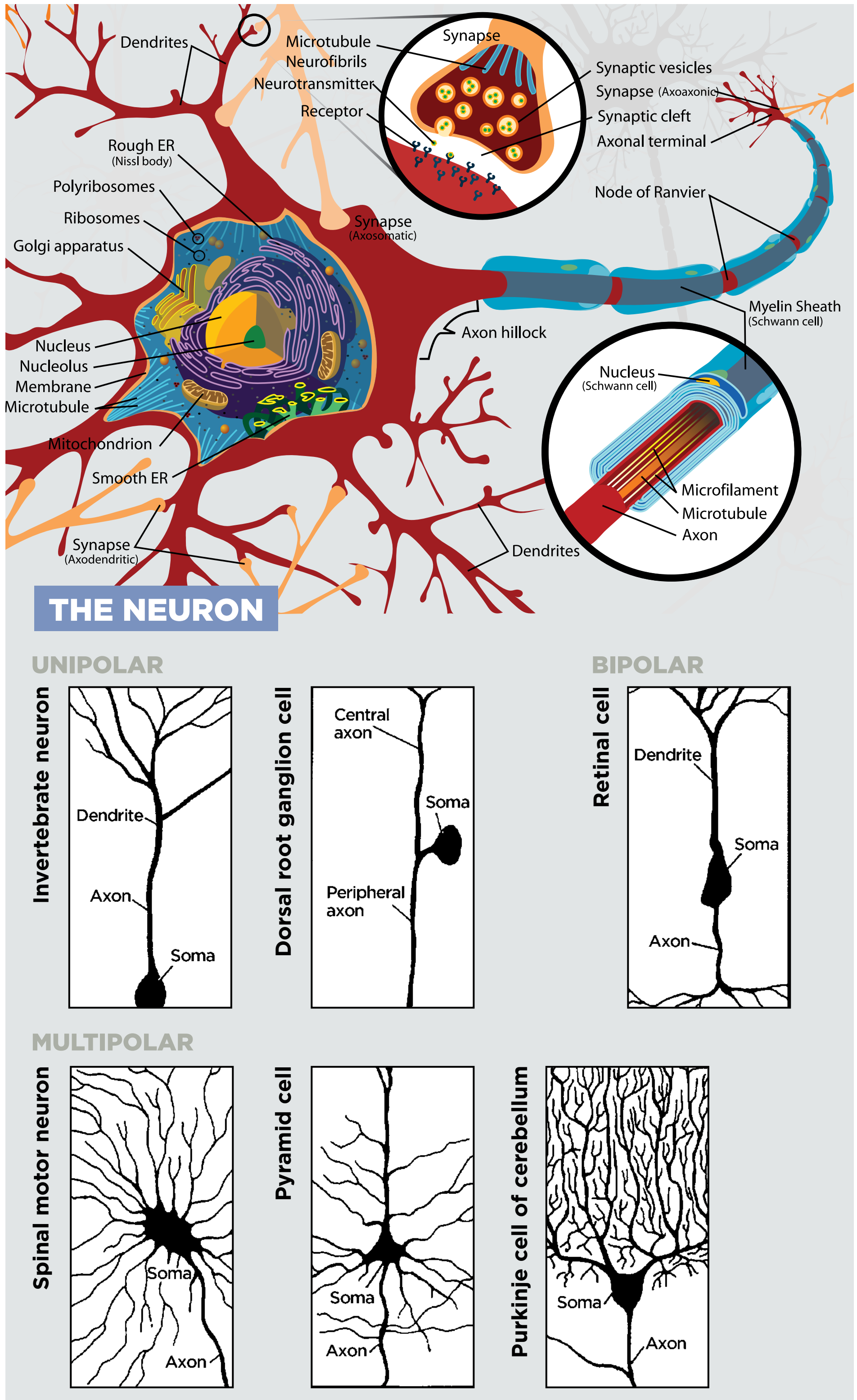
– Leonardo da Vinci

Thinking of the brain immediately conjures up an image of that lofty organ, pink and grey, convoluted, carefully encased in our cranium, managing our business and pleasure. Weighing in at about three pounds and with one hundred billion nerve cells "the brain is about as conceited as it is possible to be!"[1] Are we blinded by the pursuit of self-knowledge, the brain studying the brain? With the latest brain scan technology taking us another step forward in understanding ourselves, brain research has become a particularly important topic, especially regarding music and the brain. While neuroscientists and music educators live mostly in different worlds, this is an opportunity to begin to bridge the gap so both worlds can benefit. The growing field of neuroeducation is evidence of these changes. In this issue, we hope to stimulate a discussion about some areas of current brain research providing insight into our practice, reconciling scientific discovery with the reality of our classroom.

A BRIEF HISTORY OF IDEAS ABOUT THE BRAIN

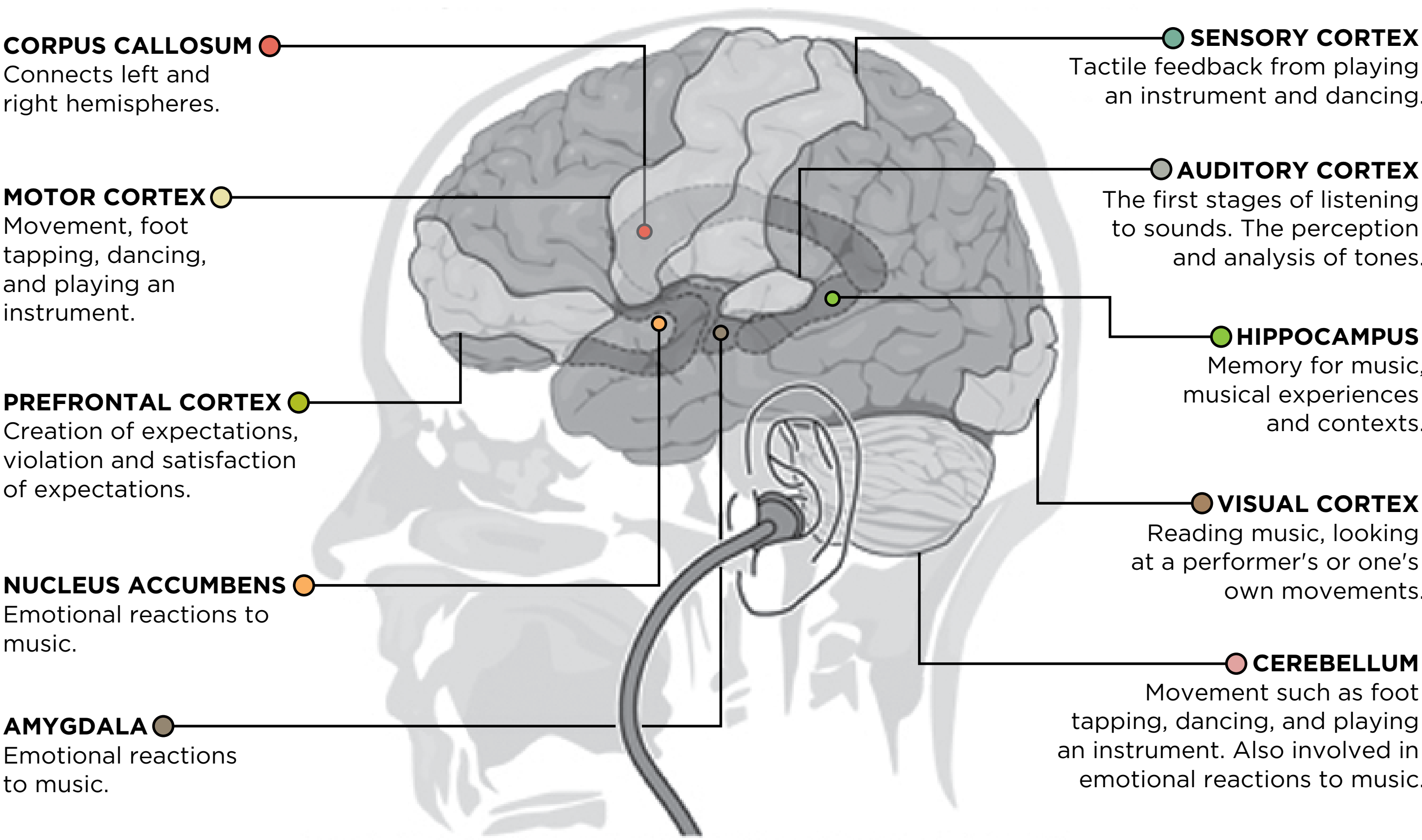
We have come a long way in our knowledge about the brain since the Egyptians. While they carefully preserved the heart during mummification, they scooped out and threw away the brain. In the fourth century BC Aristotle still believed that the heart was the center of intelligence, while the brain was a mechanism for cooling our blood. Even today we use the expression "to learn something by heart."

Indian medicine, dating from the sixth century BC, and medieval Islamic



MUSIC ON THE MIND

When we listen to music, it's processed in many different areas of our brain. The extent of the brain's involvement was scarcely imagined until the early nineties, when functional brain imaging became possible. The major computational centres include:



MIKE FAILLE/THE GLOBE AND MAIL. SOURCE: "THIS IS YOUR BRAIN ON MUSIC: THE SCIENCE OF A HUMAN OBSESSION" REPRINTED WITH PERMISSION

science, also developed theories about the brain, surgical procedures, psychological disorders, and treatment and pharmacology. Hippocrates (460–370 BC) and then in the second century AD the Roman physician Galen (basing his research on dissection of monkeys as it was not allowed to dissect humans, as well as his experience as a physician at a school for gladiators) recognized that the brain was the most important organ for thought, sensation and emotion. However, Galen believed that the solid matter was not important, and that three fluid-filled chambers controlled the three aspects of the rational soul: imagination, reason, and memory. His theories dominated for the next four hundred years, as illustrated in drawings by Leonardo da Vinci who showed three cavities in the brain. Theories about the brain continued to be influenced by Galen even into the seventeenth century with ideas about "vital fluids, spirits, and humours."[2]

French philosopher Rene Descartes (1596–1650) compared the brain's operations to hydraulic machines, which were the most advanced technology of the time. Although he was wrong, his use of the modern technology of his day as a metaphor for understanding the brain still prevails. We have often compared the brain to a computer—our most advanced technology—when in fact, the brain is far different and more complex than a computer.[3]

Englishman Thomas Willis (1621–75) coined the word "neurology" and was the first to suggest the importance of solid tissue in the brain. Although anatomists were able to describe what the brain looked like with increasing detail, the idea of the flow of fluids as the key to brain function persisted. When Italian physicist Alessandro Volta (1745–1827) discovered how to make and transmit electricity, his colleague, anatomist/physician Luigi Galvani (1737–1798), was able to discover a connection between electricity and the nervous system. Again, the discovery followed the technology. Galvani called it "animal electricity" but still thought it was a fluid secreted by the brain that flowed through nerves to activate muscles.

Even in the early twentieth century, scientists did not understand that the brain was made of cells, although the invention of the microscope made it possible to clearly establish that the rest of our body, our organs and tissues were. This is because brain cells look so different from all others, and under the microscope looked like a tangled mess. It was Santiago Ramon y Cajal (1852–1934), a Spanish neuroanatomist, who first recognized that the brain was made up of cells. Unlike other cells, with their uniformity of structure, brain cells, or neurons as Cajal discovered, come in all shapes and sizes.

With the invention of a staining procedure by Camillo Golgi (1843–1926), that enabled Cajal to follow a single neuron in the brain, he was able to propose two new ideas: one, that a neuron is a cell, and two, that neurons both receive and send out information. The idea that it was polarized—like a battery—was the key to what we now understand about brain activity.

BRAIN ANATOMY

- **Neuron** – brain cell; a neuron has a nucleus like other cells, as well as the receivers of information—the smaller branches called *dendrites*, and the senders of information—the long *axon* and its branches. By the end of the twentieth century, neuroscientists were able to show, in molecular detail, how it is that neurons generate and receive electrical and chemical signals.
- **Synapses** – Electrical impulses travel along the axon. When they reach the end, the impulse triggers the release of chemical signals that either initiate or suppress electrical signals in other neurons. The narrow gap between neurons is the place where communication between them occurs, and is called a *synapse*. "Compared to the speed of electrical information traffic along the wires in a computer (close to the speed of light), conduction velocities of impulses in the brain are slow, about 120 meters per second in the fastest conducting axons."[4] Neurons have a thousand or more synapses on their surfaces:"The complexity of the resulting signaling network in the brain is almost unimaginable: one hundred billion neurons each with one thousand synapses, producing a machine with one hundred trillion interconnections!"[5]

"The human brain has a confusing and complicated structural organization that certainly would not win awards for design."[6] The three main divisions of the brain are the forebrain, midbrain and hindbrain. These "can be thought of as a hierarchy in which the forebrain controls the midbrain, which controls the hindbrain."[7]

HINDBRAIN

- **Brain stem** – found at the base of the brain (mid- and hindbrain), deals with non-cognitive bodily functions such as breathing, the regulation of blood flow, and the coordination of locomotion. It links the brain with the spinal cord.
- **Cerebellum** – Latin, "little brain," the most complicated part of the *hindbrain* (along with the *medulla* and *pons*) located between the brain stem and the cerebrum. It coordinates with other regions of the brain to control voluntary motor functions, balance and equilibrium, and muscle tone, and processes information from all parts of the brain.
- **Medulla** – where the axons come down from the cerebral cortex and pass from the left to right side, resulting in each side of the brain controlling movement on the opposite side of the body. It is responsible for maintaining vital bodily functions such as breathing and heart rate.

- **Pons** – (Latin, "bridge"), connecting the medulla and cerebellum. Functions include breathing and facial expressions.

MIDBRAIN

The midbrain includes the *subsantia nigra*, *inferior colliculus*, *superior colliculus* and part of the *reticular formation*. Sometimes the brain stem is included as part of the midbrain.

FOREBRAIN

- **Cerebrum** – the "pink/grey" large part of the brain, divided into two halves like a walnut. This is what we usually think of as the brain, and is the most developed in humans. It has four sections: the frontal, parietal, occipital, and temporal lobes. Including the area directly below it, called the *diencephalons*, this makes up the *forebrain*. "The forebrain can be regarded as the executive centre, which considers sensory information of all kinds and formulates commands, decisions, and judgements based on the sensory information and on experience."[8] It includes the *cerebral cortex*, *basal ganglia*, and the *limbic system*.
- **Cerebral cortex** – the outer layer, about two to four millimeters thick covering both halves or hemispheres; the "grey matter." Cortex means "bark of a tree" in Latin. "The cerebral cortex is responsible for the processes of thought, perception and memory and serves as the seat of advanced motor function, social abilities, language, and problem solving."[9]
- **Basal ganglia** – the most recently evolved part of the forebrain; clusters of cell nuclei found within white matter underneath the cerebral cortex. They control voluntary movements.
- **Limbic System** – (Latin limbus means "edge") usually refers to parts of the forebrain that form a rim around the *corpus callosum* and includes the *thalamus*, *hypothalamus*, *hippocampus*, and *amygdala*. However, there is no consensus on exactly what makes up this system or what its exact functions are.[10]
  - *Corpus callosum* – the bridge between the two hemispheres of the cerebrum.
  - *Thalamus* – there are two, one on each side, deep in the brain; receives and processes the senses except smell (sight, touch, taste, hearing). Information is sent to the cerebral cortex where it is made conscious.
  - *Hypothalamus* – links the brain with the hormonal system; associated with a wide range of functions including sex, emotion, interpretation of smells, regulation of body temperature, hunger, and thirst.
  - *Hippocampus* – important in the formation of memories.
  - *Amygdala* – set of almond-shaped formations associated with the "flight or fight response" to dangerous situations as well as evaluating social information. Children with autism have been found to have abnormal growth patterns of their amygdala.

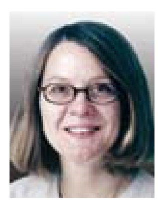
BRAIN PLASTICITY

Brain plasticity, the ability of the brain to change itself, is a concept only recently explored by neuroscientists. Although conventional wisdom has been that the brain cannot grow new cells after a certain age, it can grow new connections, new pathways. In his article in this issue, Gruhn discusses the ways movement can engrave music into our body and mind; how music learning is best understood as a body experience in children as a way of growing new connections.

THE ISSUE OF THE BRAIN

This brief history of brain research and brain anatomy is intended to give a broad overview of the subject, clarifying information found in the articles in this issue. How can the Orff philosophy of music education better support current brain research? (See the article by Marilyn Pitcairn) How and why can we use music to heal? (See the article by Concetta Tomaino.) Is there a universal innate musicality? (See the article by Shih-Yu Jade Pai.) How do singing and motor coordination impact each other? (See the article by Wilfried Gruhn.) How can we use this new information to strengthen our teaching, letting it inform as well as affirm what we may already know empirically? As Orff music educators, we have much to learn as well as offer in the evolving interface between arts education and neuroscience.

From the brain and the brain alone arise our pleasures, joys, laughter and jests, as well as our sorrows, pains and griefs.
— *Hippocrates*



***Pam Hetrick** is a member of* The Orff Echo *Editorial Board and co-coordinator of this special issue on music and the brain.*

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1 Michael O'Shea, *The Brain, a Very Short Introduction*, New York: Oxford University Press, 2005, 2.
2 Ibid., 16.
3 Ibid., 16.
4 Ibid., 28.
5 Ibid., 29.
6 Ibid., 49.
7 Ibid., 53.
8 Ibid., 53.
9 Definition of cerebral cortex. Retrieved December 4, 2009, from http://www.medterms.com/script/main/art.asp?articlekey=11490
10 Mark Buckley, Limbic System. Retrieved December 4, 2009, from http://www.answers.com/topic/limbic-system.

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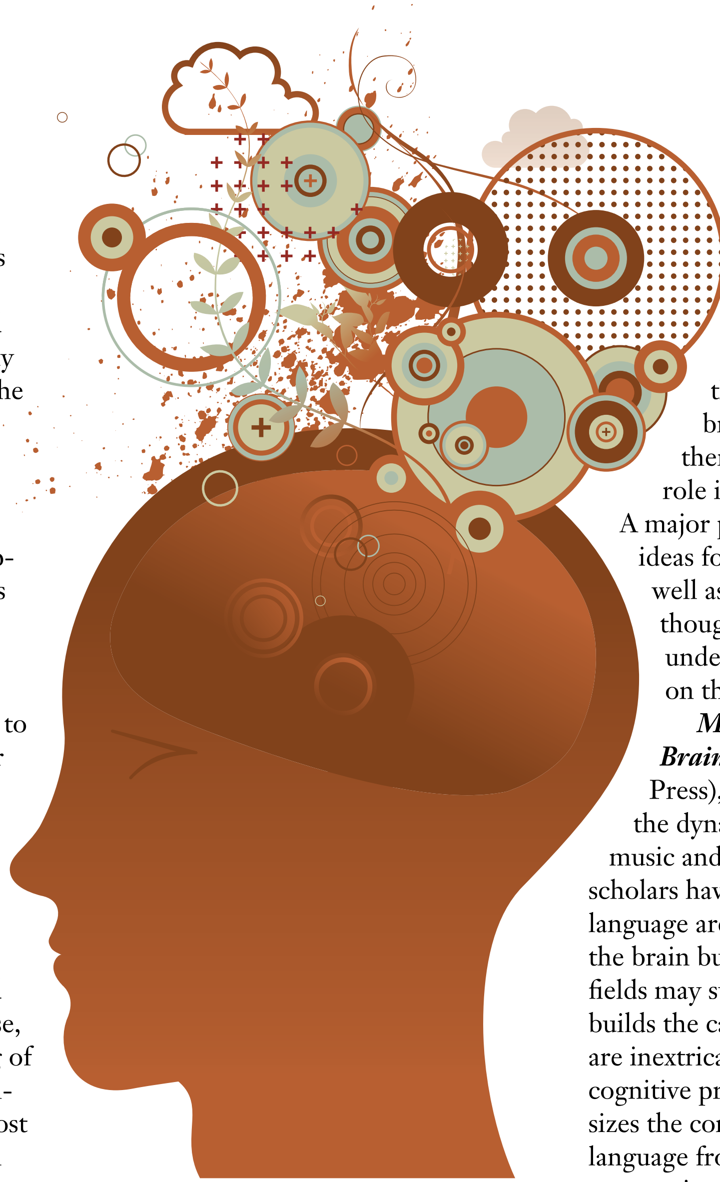
Music and the Brain: Resources for Further Exploration

BY CARLOS ABRIL



In the last decade, increased attention has been paid to matters related to music and the brain, as evidenced by the number of articles, books, documentaries, podcasts, and Web sites devoted to the topic. Many of these resources are informed by the latest research findings in the fields of neuroscience, psychology, education, anthropology, and the arts. While the link between music and science is not new, the latest developments in neuroscience are leading us into uncharted territory where the mysteries of music are beginning to unravel. As musicians and teachers, these findings are of great relevance to how we approach music, in both our professional and personal lives. At times these findings may surprise us. On other occasions, they will reinforce the things we already knew intuitively. Either way, the knowledge we glean from the latest books, documentaries, podcasts, and Web sites can help to give us purpose, direction, and deeper understanding of ourselves and our learners. What follows is a summary of some of the most recent resources (published between 2008 and 2009) that you might be interested in exploring further.

BOOKS

Music, Thought and Feeling (2009, Oxford University Press), a new book by William Thompson, examines the intersections of three disciplines: music, psychology, and neuroscience. In a writing style that helps to make highly technical and scientific findings understandable and engaging, the author invites readers to consider the evolutionary origins and nature of music and then moves on to describe the ways music is learned in the earliest years of life. The book also explains how neuroimaging techniques are being used to tell us more about the effects of music on the brain. The book includes a companion Web site (www.oup.com/us/thompson) that contains audio examples, helping to bring concepts and ideas to life for the reader. In addition, the author has created an iTunes playlist so readers can access a specially prepared collection of music for further music explorations.

Maureen Harris' new book, ***Music and the Young Mind: Enhancing Brain Development and Exchange Learning*** (2009, Rowman & Littlefield) not only presents some of the research on music cognition but also considers how it relates to the music classroom. In her book, Harris discusses the biology of music, the effects of music on brain development, music's therapeutic functions, and its role in teaching gifted children. A major part of this book provides ideas for building curricula, as well as specific music lesson plans thought to be informed by an understanding of the research on the brain.

Music, Language, and the Brain (2008, Oxford University Press), by Aniruddh Patel, probes the dynamic relationship between music and language. In the past, scholars have argued that music and language are two distinct domains of the brain but recent research in diverse fields may suggest otherwise. Patel builds the case that music and language are inextricably intertwined human cognitive processes. The book emphasizes the commonalities of music and language from a cognitive neuroscience perspective, discussing the similarities in relation to rhythm, pitch and timbre, melody, meaning, syntax, and evolution.

Daniel Levitin's ***The World in Six Songs: How the Musical Brain Created Human Nature*** (2008, Penguin) is a highly readable book that examines the musical nature of the human brain from the standpoint of something music teachers use every day—songs. He does so by describing recent scientific findings and balancing them with more casual interviews with popular musicians such as Sting, Paul Simon, and Joni Mitchell. Six of the chapters are thematically organized around different song types: songs about friendship, joy, comfort, knowledge, religion, and love. The author suggests that these song types have each contributed to the development of human societies around the world. Like many authors writing about music and the brain, Levitin includes an evolutionary argument for why music is a part of all human cultures.

DOCUMENTARIES

Musical Minds (2009) is a NOVA documentary that examines the things music can tell us about the human mind. Author and neurologist, Oliver Sacks, PhD, presents four cases of patients who suffer from debilitating medical conditions and are using music as a tool for therapy. Video footage illustrates how the brain reacts to music (both actual and imagined) using a functional MRI machine. This documentary suggests that music has the ability to stimulate the brain in ways that nothing else can.

The Music Instinct: Science and Song (2009) is a PBS documentary that considers when and how music becomes something more than just sounds and silences, and if musicality is learned or innate (See review in this issue). Musicians such as AOSA advocate Evelyn Glennie, cellist Yo-Yo Ma, and singer/conductor Bobby McFerrin, as well as scientists such as Daniel Levitin and Oliver Sacks are featured. This documentary examines the ways the brain processes rhythm, pitch, and timbre, as well as the ways the body reacts to these sounds. This is a program that ably crosses and blurs the lines between art and science. This documentary recently won the Grand Prix award at the International Science Film Festival.

PODCASTS

Library of Congress: Music and the Brain (*http://www.loc.gov/podcasts/musicandthebrain*) The Library has sponsored a two-year series of lectures, discussions, and symposia on the topic of music and cognitive neuroscience. The talks by musicians, scientists, physicians, and other experts are recorded and offered as podcasts free of charge at the above Web address.

The knowledge we glean from the latest books, documentaries, podcasts, and Web sites can help to give us purpose, direction, and deeper understanding of ourselves and our learners.

Science Weekly: Music and the Brain (*http://www.guardian.co.uk/science/audio/2008/aug/18/science.weekly.podcast*) This podcast explores "why music evolved, how it is linked to language, how it is understood by the brain and how it can be used to treat patients." In addition to examining the scientific findings, this podcast considers how the social dimensions of the musical experience affect behavior and how it can serve to treat patients with degenerative diseases.

NPR's All Things Considered: Musicians Hear Better (*http://www.npr.org/templates/story/story.php?storyId=113938566*) This podcast explains the latest research findings of Northwestern University scientists who have discovered that musical training can actually improve human hearing. Findings suggest that "serious musicians are better than other people at perceiving and remembering sounds." According to the findings, it is not because the musicians' ears are better but because they are better able to process sounds in the brain.

NPR's Talk of the Nation: Music and the Brain (*http://www.npr.org/templates/story/story.php?storyId=1258168*) Host of Talk of the Nation, Ira Flatow, and his guests explore the ways that music affects the brain. Specifically, the discussion focuses on helping to explain why it is that certain pieces of music gets stuck in our heads and why it is that we associate certain songs with memories and images.

Carlos Abril *is associate professor of music education at Northwestern University, a member of* The Orff Echo *Editorial Board, and co-coordinator of this special issue on music and the brain.*

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BY KERRI LYNN NICHOLS

Practically Orff Schulwerk

Imitation: Awakening mind, body, spirit, and community

Twenty-five years ago, when I first began my teaching career, I thought my skills as a musician, a strong GPA in my college courses, and a freshly printed teaching certificate would guarantee success as I optimistically bounced into my first day as an elementary K–6 music specialist. The fifth and sixth grade children had other ideas, however, and I soon realized that there would be quite a bit of on-the-job training involved in my new career.

To address this, I began my formal Orff Schulwerk training which provided me with a practical approach to teaching music that really worked with kids. By its very nature, the Schulwerk is brain-compatible education. Brain-compatible education is a term that refers to effective teaching strategies that emphasize how the brain learns naturally based on current neuroscience regarding the structure and function of the human brain at varying developmental stages. In the Orff classroom, active experiences set the stage for complex learning to occur. Through creative collaboration, children gain multiple opportunities for cognitive and social-emotional development. Using the body as a dynamic force and sensory information center, kids connect to their motor intelligence and ground themselves in the physical world. The Orff approach is adaptive to meet the needs of the individual learner in the moment; it provides just enough challenge necessary for higher order thinking in a non-threatening environment.

Sometime after I had completed my Orff training, I came across a conceptual, brain-compatible lesson sequence created by my colleague and friend Anne Green Gilbert. The design mirrors the way one learns language, from imitation to creation, and it fit with the Orff process like a glove. Over time, I adapted the original plan slightly and continue to do so. It has streamlined my teaching, provided clarity for my students and allowed their creativity to soar as I become superfluous.

Whether you write out formal lesson plans, jot notes to yourself on a calendar or just "wing it," most successful lessons include the following components:

IMITATION: (TEACHER DIRECTED)

Base Cognition Level: Knowledge

The most elemental way we learn is through observation and imitation. Be-

Exploration: Learning through partner play.

Developing Skills: Learning new information (teacher directed)

gin the session by introducing a single music (or dance) concept via imitation that will be the focus of the lesson through four sensory modes: hear, see, say, and do. This concept will be the connecting thread for the experiences that day. Using this concept, lead the class in a quick activity that engages mind, body, and voice. Examples might include the BrainDance® (a sequence of eight developmental movement patterns), a welcome song with movement or echo phrases.

EXPLORATION: (TEACHER GUIDED)

Base Cognition Level(s): Comprehension & Synthesis

Once a baby imitates a sound he or she has heard, the baby begins to play with the possibilities. The exploration portion of the lesson includes experiences that have guidelines and experimentation, like structured play, games or improvisations that use the concept creatively. Moving beyond simple imitation and knowledge, children seek to learn more about the concept, looking at it from different angles and trying out their ideas in real time. Name games and question-answer improvisations are two examples of exploration activities. It is important to give reflection time at the conclusion of any exploration, to share discoveries with the group and allow for brain recuperation.

DEVELOPING SKILLS: (TEACHER DIRECTED)

Base Cognition Level: Knowledge and Application

When learning a new language, the baby needs an opportunity to practice the new sounds and words he has discovered. Likewise, the developing skills section progresses from the exploration and is structured for skill development and practice in relationship to the concept. New information may be presented by the teacher and additional ideas or skills may be combined. Examples would include teaching a song, dance, instrument part, or technique related to the concept. An idea from the exploration might be further developed here.

Most educators today spend the majority of the lesson time on developing skills in order to "cover material." However, in a brain-compatible teaching model, the goal is to move toward expanding exploration, creating, and reflection experiences which provide students with opportunities to develop higher-order thinking skills.

CREATING: (STUDENT DIRECTED/TEACHER SUPPORTED)

Base Cognition Level(s): Analysis and Synthesis

Using the concept, the students are asked to work individually or in small groups to create something new that can be shared with others. Improvisations, compositions and choreography are examples of creating activities. They are less experimental than the exploration experiences and the teacher's input is limited. Clear parameters are given at the beginning so that the teacher will be able to assess whether there was an understanding of the concept.

REFLECTION: (TEACHER GUIDED)

Base Cognition Level: Evaluation

Creations from previous steps are shared with the class, while students make observations and give feedback to each other. Careful attention is given to articulating how the concept was expressed in each piece and suggestions for revisions are made. The reflection is also a time for self-evaluation, discussions, and impressions that can be shared in a circle. Students review the concept in their own words and make connections to other curricula. For closure, choose a short focusing, transition, or community activity for brain recuperation. ■

Kerri Lynn Nichols has taught Orff Schulwerk for twenty-five years. A prolific children's composer, author, and recording artist, she collaborates with educators across the country and abroad and has attended the International Course at the Orff Institut in Salzburg. She coordinates The Olympia Orff Schulwerk Course in Washington and numerous community children's projects.

Author's Note: For samples of specific lessons demonstrating this lesson model, visit www.treefrogpro.com.

Creating: Movement improvisation based on a rhythm concept

Reflection: Sharing insights, questions, and favorite parts of the lesson

RESOURCES

Bloom, Benjamin
Taxonomy of Cognitive Objectives
http://oaks.nvg.org/taxonomy-bloom.html

Brain-Compatible Classroom
http://xnet.rrc.mb.ca/glenh/new-page124.htm

Creative Dance Center
www.creativedance.org

Gilbert, Anne Green
Brain-Compatible Dance Education. NDA/AAHPERD, Reston VA. 2006.
BrainDance. AGG Productions, Seattle, WA. 2003.

Nichols, Kerri Lynn
Music For Dancers. Kerri-oke Publications/Tree Frog Productions, Olympia, WA. 1998/2010 Second Edition.

Teacher Tap
Brain-Based (Compatible) Learning.
http://www.eduscapes.com/tap/topic70.htm

Tree Frog Productions
www.treefrogpro.com

Brain Research Brings Clarity to Our Instructional Practice

BY MARILYN PITCAIRN

Teaching, like medicine, is both science and art. As teachers, we learn our craft, observe and reflect on our teaching, and then adjust to improve its effectiveness. Scientific inquiry into the process of teaching and learning has reached an unforeseen high point. Through computer imaging, we can now see the processes we could only imagine before. We can verify our intuitions about learning processes, and use visual records in place of theoretical constructs. As a result, the evidence for the value of arts education has become monumental and indisputable. And implications for practice are valuable and transfer well to the music classroom.

My curiosity about cognition began during my college piano-performance years. Although I prepared my Bach fugue meticulously, with countless rehearsals, I could not remember the first note on the day of my performance. Then, after a few false starts, I played it flawlessly. Brain research has given clear definitions to this sort of muscle memory, known more precisely as procedural memory. We know the immense power of the cerebellum, that small area of the brain that governs movement, to provide another sort of recall apart from consciousness, and we know its apparent limitations, that procedural knowledge becomes inaccessible to conscious recall.[1] Pianists are well advised to think about their music in different ways, to elaborate their memory with attention to theory and analysis so that secure conscious recall is ensured. And teachers are well advised to consider best practices to store and recall all types of knowledge, because elaborate learning is durable.

My interest grew as I spent countless late nights during my degree readings in psychology and learned of inquiry into cognitive psychology through models based on artificial intelligence.[2] This area of knowledge led to new conversations about human learning processes. Developmental psychologists and constructivist learning theorists were asserting that students need to create multiple representations of knowledge, to actively process new learning through classroom dialog and other hands-on, minds-on practices, so that they develop many pathways, or networks of brain cells, leading back to the information stored in memory. Education researchers were uncovering the need for authentic, contextualized learning in all content areas. As musicians, performers, and teachers, brain research directly impacts our practice, and offers highly effective strategies, well matched to our Orff traditions. This article will look at specific teaching practices that complement the propensities of the human brain, practices that will improve our instruction, student learning, and memory.

Acting out a Yiddish tale. Low stress-high challenge.

We teach an area of the curriculum that develops the whole mind for learning. Knowledge of current research will not only guide our instruction and improve our teaching, but will also help us understand how music governs learning across content areas. In fact, brain research holds the key to defining the value of the arts. We know through intuition and research that music supports reading and math, and broadens knowledge in social studies and science. We know that specific instructional practices improve phonemic awareness, fluency, directional sense, and phrasing. Yet, we believe that arts education needs no justification from other content areas, and the value of music education is subtly undermined by utilizing the arts to improve test scores. In addition, we know that the great impact of our content on other learning is not easily measured.

In his book, *Arts with the Brain in Mind*, Eric Jensen defines with great clarity the power of music education: "The arts enhance the process of learning. The systems they nourish, which include our integrated sensory, attentional, cognitive, emotional, and motor capacities are in fact the driving forces behind all other learning." The arts are not for quick results with inflating test scores. Rather, "the benefits, when they appear, will be sprinkled across the spectrum, from fine motor skills to creativity and improved emotional balance."[3]

Furthermore, "art-making helps students acquire a feel for what it means to transform an idea into a product or art form." The arts develop creativity and a "willingness to imagine and explore ideas that have not existed before."[4] In the words of author Daniel Pink, these are markers of a "whole new mind," one that is more adaptive, functional, and responsive to contemporary societal needs. While technology has provided nearly limitless access to information, it is creativity that will light the way through the great challenges of this age, and it is a sense of artistic beauty that admonishes our values.[5]

Let us look at practices in the Orff tradition, which have found strong support and confirmation from this growing body of research.

CONNECTIONS AND ORGANIZATIONAL STRUCTURES

The physical structure of the brain cell or neuron, with its finger-like structures called *dendrites* receiving information into a palm-like cell body, and transmitting it through an arm-like structure or *axon* across a gap known as the *synapse* to other cells, suggests a teaching style that emphasizes connections, connecting new learning to prior knowledge.[6] All good teaching requires that students develop organizational structures, and then attach their new learning to that structure. It is important to organize instruction, but "it's far more important—and a requirement for good teaching—to ensure that the knowledge *in the student's brain* is well organized."[7] We organized our lessons plans, but did our students organize their learning, attaching concepts to prior knowledge? That is the key to robust knowledge and secure memory.

Improvising on Mozart variations before creating student variations. Movement energizes the brain.

Students should learn how to organize knowledge. They need practice explaining knowledge to others, and they need to hear diverse explanations. They need to write or represent their mental models visually. They need to use their organized knowledge to strengthen the neural connections, the networks or pathways of interconnected brain cells, through application and practice. Remember that "students will learn better by doing than by only watching something being done," truly an axiom of Orff education.[8] When knowledge is situated in an organizational structure, it becomes flexible and transferable.

Thus, when teaching high and low pitches to primaries, we include graphic representations, or allow students to create their own pictorial representations. We allow them to play with their pre-reading symbols, by "conducting" vocal or instrumental sounds, as illustrated in the *Music for Children, Orff Schulwerk American Edition, Vol. 1*.[9] When fourth-graders are creating variations on "Twinkle, Twinkle" or other hexatonic literature from the Schulwerk, we allow them to name and identify the compositional devices they have employed. [This is a practice that I learned from Barbara Grenoble.] When introducing a full major scale to fifth graders, we show them a tonal ladder, and review the sequence of pitches they have added through the years before completing the scale. We purposefully include a canon such as "Come Follow" or other major scale songs and allow students to identify the scale sequences in those songs and in Mozart sonatas as well. In this way, learning becomes organized into a framework, connections become secure, and knowledge is usable for a lifetime.

TIME TO PROCESS

Brain-compatible instruction allows time for processing because learning is a physical process, causing changes in the brain that require recovery time. If information is not allowed to settle, memory for the new learning is lost.[10] Neurons and the synaptic gap literally require time to physically process learning, and the hippocampus, responsible for organizing new learning, has a sort of "surge protector" feature that actually inhibits or slows down processing, limiting the rate at which information can be accommodated. Learning improves with shorter sessions, whereas "moving from one piece of learning to the next too rapidly virtually guarantees that little will be learned or retained."[11]

In other words, the brain has a huge capacity to learn, but that capacity is limited by the physical need for processing time. "You can teach more and faster, but students will simply forget more and faster."[12] The brain literature is full of references to the need for incubation and settling time, the physical processes of building connections, the need for short sessions to improve learning, and the need to shut down incoming stimuli to allow time for the linking of new information to prior knowledge. "The brain is not built for continuous focused input"—thus the renewed emphasis on depth versus breadth of content explorations.[13]

The Orff Schulwerk model of teaching is well matched to the brain's physiology and propensities. A piece may be learned rhythmically through playful and engaging body percussion sequences that require mental focus, but that later become automatic as procedural memory. Then the refreshed mind may process that piece in a new context, performing the rhythm on a percussion instrument. There will be no overload when we follow the tenet of Orff instruction, teaching new skills with familiar material.

"Let me see you make a motion, two by two." Choice increases motivation.

> The brain literature is full of references to the need for incubation and settling time, the physical processes of building connections, the need for short sessions to improve learning, and the need to shut down incoming stimuli to allow time for the linking of new information to prior knowledge.

Also, consider the great value of all work with improvisation, using newly learned pitches or rhythms to create fresh combinations, thus allowing the mind to retire from processing and more new learning, and to elaborate or integrate the concepts. Learn the text and rhythms of "Ding Dong Diggi Diggi Dong" from *Music for Children/ Murray Edition, Volume I* (Schott), and then allow plenty of time to improvise on the sixteenth-note rhythms along with prior known rhythms in the piece. Learning will settle, and performance will be rhythmically secure and cognitively positioned within a framework of prior knowledge.

MOTIVATION, EMOTIONS, MOVEMENT: BRAIN RESEARCH AND THE POWER OF ORFF PRACTICES

What happens to student motivation levels when you invite students to make up a new line of text to a song, or to create a rhythmic variation on an instrumental piece, or to choose a new accompaniment pattern for a short melody, or to choose a favorite meter for a poem? Student choice helps create the ideal learning context of low stress and high challenge.[14] "When a student feels some control over the learning process, a wider range of learning, both rote and meaningful, occurs. Under these circumstances, the brain's cortex is more fully functional."[15] And it is the cortex that governs higher-level thinking and creativity. Brain research does not support the use of extrinsic rewards to promote learning, but advocates use of the brain's own system of rewards, namely, opiates that are released even through the mere "prediction of a pleasurable outcome."[16] Motivation is increased through active learning and the gratifying experience of receiving positive feedback. Group projects and the sharing of mini-performances are research-based practices, embedded in our Orff traditions.

While the effects of storytelling and engaging the emotions through dramatic play are plain to see on the faces of our students, the effects on recall and memory and the amount of learning that takes place are clearly revealed in the pages of brain research. Emotions drive attention and the passion for learning. "All emotional events receive preferential processing in the brain…"[17] Emotions activate and stimulate the brain and greatly enhance recall. Playful activities cause the body to release dopamine and norepinephrine, and both chemicals positively impact long-term memory. Intense arousal of the amygdala, the brain's emotion center, results in a strong imprint upon memory.

Do you think better on your feet? Yes, you do. That's because movement and exercise fuel the brain with oxygen, and are even credited with stimulating the growth of neurons. Informed teachers and effective training programs use movement, location in the room, and gesture to secure memory. In addition, movement simply makes us smarter, reduces stress, and enhances brain functions.

We know the value of movement to develop secure knowledge of rhythms, to teach rhythmic sequences, and to facilitate rhythmic memory. We may not know that the cerebellum, responsible for movement, "stores a great many neurons and that this powerful piece of equipment has neural connections to many other brain structures."[18] These connections are "outbound," affecting learning throughout the structures of the brain.[19]

> When a student feels some control over the learning process, a wider range of learning, both rote and meaningful, occurs.

As Jensen states, there are about 33,000 scientific articles in the MEDLINE database on the topic of movement, and most of them confirm that exercise supports cognition. Our colleagues in other content areas do well to borrow from movement-based Orff education. "The whole notion of using only logical thinking [in the content areas] flies in the face of current brain research."[20] In fact, all activity-based learning "creates a wider, more complex, and overall greater source of sensory input to the brain than mere cognitive activity," resulting in more secure learning and memory.[21]

Brain research validates our practices and clarifies the reasons for their effectiveness. Even experienced and proficient Orff teachers will clarify their use of strategies, which seem to always meet with success, because they are matched to physical processes.

Purposeful application of teaching practices that are grounded in this growing body of research will certainly add a new level of mastery to our instruction. My own teaching has deep roots in constructivist theory, consistently setting concepts about music into a rich experiential base. Nevertheless, my focus on these research-based practices has produced more engaged learners, as I intentionally apply my knowledge of the value of student choice, the need for organizational structures, the importance of a supportive emotional climate, the deliberate allowance for processing time, the energizing effect of moving students to awaken the mind, and the bounty of instructional gems that have poured from this riveting new fund of knowledge.

As we continue to read the literature on brain research, we will bring greater clarity to our instructional practices and greater conviction to our true assertions about the power of music education. We may even decide to reword our claims to less subtle constructions. Music develops the mind. Music grows the brain!

__Marilyn Pitcairn__ has been a frequent presenter at state and regional conferences of the International Reading Association, focusing on emergent literacy, phonemic awareness, and fluency, and has presented research on these topics for CMEA. She has a degree in psychology, has lectured on the topics of brain anatomy and general psychology, and has assisted with research projects on motivation and intrinsic rewards. She is a K–5 music teacher and the elementary music coordinator for the Adams 12 School District in Westminster, Colorado.

1 Patricia Wolf, *Brain Matters: Translating Research into Practice* (Virginia: ASCD, 2001), 114.
2 John R. Anderson, Cognitive Psychology and Its Implications (San Francisco: W. H. Freeman and Company, 1980).
3 Eric Jensen, *Arts with the Brain in Mind* (Virginia: ASCD, 2001), 2.
4 Ibid., 116.
5 Daniel Pink, *A Whole New Mind* (New York: Riverhead Books, 2006).
6 Marilee Sprenger, *Learning and Memory: The Brain in Action* (Virginia: ASCD, 1999).
7 Eric Jensen, *Arts with the Brian in Mind* (Virginia: ASCD, 2001), 48.
8 Ibid.
9 Regner, Hermann,ed. *Music for Children* (Orff-Schulwerk American Edition) Vol. 1 (Schott Music Corporation, 1977), 1, 29, 33, 49-51.
10 Eric Jensen, *Teaching with the Brain in Mind* (Virginia: ASCD, 2005), 42–43.
11 Ibid., 43.
12 Ibid., 42.
13 Ibid., 43.
14 Eric Jensen, *Teaching with the Brain in Mind* (Virginia: ASCD, 2005), 107.
15 Laura Erlauer, *The Brain-Compatible Classroom: Using What We Know About Learning to Improve Teaching* (Virginia: ASCD, 2003), 59.
16 Eric Jensen, *Teaching with the Brain in Mind* (Virginia; ASCD, 2005), 105.
17 Ibid., 71.
18 Eric Jensen, *Teaching with the Brain in Mind* (Virginia: ASCD, 2005), 71.
19 Ibid., 61.
20 Ibid., 66.
21 Ibid., 136.

President's Message

CONTINUED FROM PAGE 6

how effective Orff Schulwerk is with children, they are hooked!

Susan Wheatley, professor at the Indiana University of Pennsylvania, has begun a collegiate chapter of Orff Schulwerk, which she and her students call "Collegiate Orff Schulwerk Affiliate" (COSA). Although AOSA doesn't currently have official student chapters, our Membership Committee is exploring the possibilities and ramifications of AOSA Student Chapters. How exciting!

What began as a positive "echo" for Orff Schulwerk in Germany has continued to resonate in the United States for more than forty years. What can you do to help our tradition continue to thrive? How can you encourage a new member to join AOSA? The echo still resounds, and the future is bright!

1 The Güntherschule was the school founded in 1924 by Dorothee Günther and Carl Orff for "Elemental Music Practice." The first students were seventeen young women, ages eighteen to twenty-two.
2 Carl Orff, *The Schulwerk*, trans. M. Murray (New York: Schott Music Corp., 1978), 212.
3 Ibid.
4 The definition of the word "echo" in German is "response" or "the reaction in the press" (from *Concise Oxford-Duden German Dictionary*).
5 Ibid., 216.

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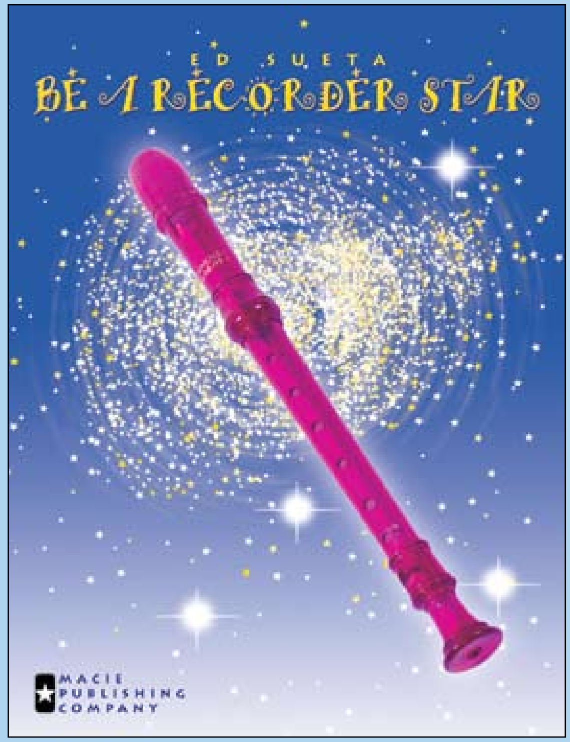

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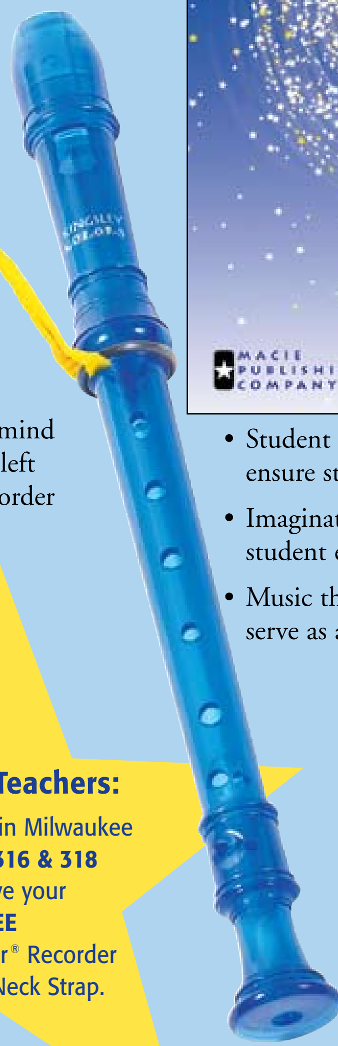

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How Music Can Reach the Silenced Brain

BY CONCETTA M. TOMAINO

My awakening came in a small nursing home in East New York more than twenty years ago.

Strange sounds and the cadences of repetitive speech filled the dementia day unit. In the noisy chaos, some residents slowly limped around the room or along the halls; others sat, heads down, silent, seemingly unaware of their surroundings. Here were all the human losses that we associate with dementia, stroke, and late stages of neurologic diseases. Visitors to nursing homes know them well, and most assume, as I did, that the lost functions are gone forever. Indeed, I asked myself that day, what could music possibly do for men and women so afflicted? Still, I had come to begin my work as a music therapist, so I sat down at the piano and started to play "Let Me Call You Sweetheart."

At first, I could barely hear myself play. But after a few minutes, the sound of singing began to rise above the noise, then dominate it. As I watched, even the silent patients turned their gaze to me. It was too remarkable a change to assign only to the allure of an old familiar song. People who had seemed unable to focus became attentive. Residents whom I knew to have limited cognitive skills had recognized the melody; their voices found the right words. Some with seemingly uncontrollable repetitive movements now kept steady time with their hands and feet.

I wondered: Could our processing of music be so different, or so basic, that abilities relating to it remained accessible in people so limited in function? In 1978, little was known about music and brain function. Today, as a result of exponentially increasing research, particularly over the past five years, we can venture some initial answers to my question.

MUSIC'S FORGOTTEN SECRETS

Music predates recorded history, but its roots may lie in early human communication and rituals for healing. In traditional African cultures and rain forest cultures in other parts of the world, for example, music is connected with many of life's vital patterns and occasions. In Western culture, however, as music became increasingly accepted as an art form, its therapeutic properties were mostly forgotten—rediscovered only when music therapy became an organized field in the early 1950s. Since then, a torrent of peer-reviewed clinical and scientific studies have focused on music's therapeutic value in areas from reducing pain, to improving memory and cognition, to helping motor function. But even though we know how effective music therapy can be, the investigation of its effects on recovery of function in people with neurologic impairment is new and exceedingly challenging.

Music is a complex stimulus, involving everything from pitch to rhythm, melody to volume. Consequently, it is not processed in a single area of the brain. We can see this in what is called "amusia," in which a single musical skill is lost when a specific area of the brain is damaged—for example, loss of pitch perception resulting from lesions to the right temporal lobe. But while a component of music, such as pitch, may be processed in a specific region of the brain, the overall experience of music is a gestalt of perceptual and psychological processes occurring in synchrony and involving a spectrum of neurologic activity and brain regions.

We now know from clinical case studies that music can affect—in very specific ways—human neurological, psychological, and physical functioning in areas such as learning, processing language, expressing emotion, memory, and physiological and motor responses. How your brain perceives and processes music also differs depending on whether or not you are a musician. The effects of music raise intriguing questions about both early brain development and brain plasticity later in life.

SAM: GETTING THE BEAT

Sam, a man in his late sixties, was recovering from a stroke. His physical therapist rated him a "guarded walker"—able to shuffle along with a quad cane, but not steady enough to walk outdoors, where he might have difficulty negotiating the uneven pavement. Because his left side was weak, his left foot dragged along the floor, causing him to take faltering steps. Each step was slow and hesitant, as Sam focused intensely on the process of walking. After he had been in traditional physical therapy for two months, and was showing little further improvement, he was referred to music therapy in the hope that he could improve his sense of his body's position and his balance.

The physical therapist tested Sam's gait, and I found music with a tempo that matched the pace of his stride. He knew the music and was comfortable walking to it. In fact, he told me how, as a teenager, he used to go dancing every week at the gym. As he walked, he became more confident of his movements. Amazingly, he began to add dance steps, sliding his feet or clicking his heels. He said he couldn't help it; it just happened. He wasn't "thinking about walking," he said, he was "thinking about dancing."

Could there be a separate motor

COURTESY OF CONCETTA M. TOMAINO

There are several cases in which a patient has recovered speech through the systematic use of rhythmic patterning, leading first to recovery of familiar lyrics and words embedded in songs, then to self-initiation of normal, fluent speech.

template for these dance movements, so different from walking? Or was it lack of conscious motor planning on Sam's part that freed up his motor cortex to send the necessary signals to his legs? As the sessions went on, he became more inventive in his movements. After several weeks of twice-weekly meetings, he began lifting his left foot off the floor. Now his steps were in perfect time to the rhythm of the music. He was not consciously aware of this, but he said that he could feel the tempo in his leg and thought that he was able to feel the floor with his left foot. This suggested that he was regaining sensation and control in that side of his body. But when the music stopped, Sam would again shuffle and drag the affected leg. We worked together for two months, twice a week, and his physical therapist also had Sam sing the song to himself as he walked in the rehabilitation gym. The music's rhythm was an external cue that organized Sam's walking without conscious effort.

Rhythm is, in fact, the primary property of music and is critical to human life in other ways. Plato defined rhythm as "the order in movement," and the temporal structure of music (its movement) has suggestive parallels in human motor development. At five months of age, when a fetus's neural circuits and auditory memory are forming, it experiences rhythm through the mother's heartbeat and respiration. Immediately after birth, basic motor patterns begin to develop. While eating, crawling, and walking, each child finds a cadence, particular motor rhythms that will remain fairly consistent throughout life. Our natural and spontaneous body movements may be outward representations of inner timing mechanisms. Leon Glass, PhD, at McGill University, and other scientists are investigating the complex mathematics of physiological rhythms and how they interact to maintain our health. We know that an alteration in internal rhythm—cardiac arrhythmia, for example—can be the harbinger of ill health or death.

Some internal rhythms can come to match external rhythms. In effect, a rhythm in the external world is heard and internalized, evoking an answering rhythm within us. When we understand how and when external auditory rhythms, or cues, influence various internal timing mechanisms, rhythm can become a powerful therapeutic tool.

The effect of external rhythmic cues on motor function, as we saw with Sam, is a prime example of how this influence occurs. Brain-imaging studies show that an area in the prefrontal motor cortex will start to become active at precise intervals in anticipation of a sequence of motor activity, such as finger tapping at one-second intervals. The resiliency of this motor-timing mechanism is strikingly apparent in people whose motor control, or motor initiation, has been lost as a result of a stroke or Parkinson's disease, but whose brains still respond to a rhythmic stimulus.

In neuromuscular diseases affecting the ability to initiate and control movement, external rhythm seems to supply the timing information that makes movement possible. For Sam, even singing the song to himself provided the required neurologic benefit, the external cue. Writer and neurologist Oliver Sacks, author of *The Man Who Mistook His Wife for a Hat*, eloquently describes a similar response to music in one of his post-encephalitic patients, who had great difficulty walking alone but walked perfectly if someone walked with her—or could time her steps to music. She said: "Whether it is others, in their own natural movement, or the movement of music itself, the feeling of movement, of living movement, is communicated to me. And not just movement, but existence itself." Sacks studied this phenomenon in the EEGs of some of these patients when they merely imagined a specific piece of music. Although their regular EEGs were very abnormal—the brain was slow on one side while convulsive on the other, for example—when they played the piano or simply imagined a piece of music, their EEGs became more normal.

WHY MOVEMENT RESPONDS TO RHYTHM

Michael Thaut, PhD, and his colleagues at Colorado State University suggest that the sensitivity of our motor systems to influences from sounds may have developed during human evolution so we could use the way we process what we hear to enhance our ability to organize and control our movements. Our basic auditory-arousal mechanisms (for example, our movements in reaction to a sudden loud noise) operate primarily through the amygdala in the brain's limbic system and may have originated in adaptive evolutionary processes, namely, the fight-or-flight response. In any case, the auditory system has connections to the brain stem, midbrain, and higher cortical structures, and normal motor function requires that these subcortical and cortical regions work in concert with each other.

The basal ganglia, a brain region affected in Parkinson's disease, provides a link to still other areas of the brain that connect mental processes and the initiation of movement. While the thought or wish to move depends on higher cortical processing, the actual ability to move depends on lower brain regions. If the higher cognitive processes that can initiate movement are damaged in traumatic brain injury or stroke, the requisite will to move may nevertheless get a "jump-start" by stimulating motor nerves that are still functional. Does the patterned auditory cue supplied by musical rhythms excite the more primitive motor areas first, and only then recruit or drive higher cortical circuits into action?

New evidence from studies by Wen Jun Gao, PhD, and Sarah L. Pallas, PhD, at Georgia State University suggests that learning, or at least the organization and development of cortical circuits in the brain, is influenced by patterned sensory activity, such as listening to sound clicks presented at specific time intervals. If such sensory signals turn out to enhance neural development, what role does rhythm—patterned auditory stimulation—play in the restimulation of these networks once they have been laid down? In patients like Sam, regaining physical function began on a spontaneous, unconscious level, indicating that the subcortical areas of his brain were being activated before the restoring of the higher cortical areas involved with the thought and the intent to initiate movement.

MARY: RHYTHM AND MELODY FIND A VOICE

Rhythm also has a therapeutic effect for people with dysarthria, a motor/speech problem that occurs when functioning of the vocal organs is impaired. Dysarthria results in poor articulation of words; speech is slurred and, in the most severe cases, unintelligible.

Mary, a fifty-six-year-old music therapy patient, had been in a coma for three months. It left her with severe dysarthria—a lack of vocal tone and severely distorted articulation. Spasmodic tremors contributed to the severity of her symptoms, and she had an open tracheotomy that made vocal sound production even more difficult.

Because weak muscles made her breath control poor, she also had difficulty sustaining any sounds she did make. Mary's overall comprehension of language, however, was intact. She was getting speech therapy to help her produce adequate yes or no responses, develop techniques for functional communication, and maximize existing "mouthing" skills, including motor gestures like chewing and yawning.

We knew that Mary had sung in her church choir and was familiar with many old hymns. In fact, even with her inability to sustain any intelligible sounds, she participated in weekly music therapy sessions on her hospital unit, silently smiling at the old tunes. With encouragement, she would attempt to sing along. I could see that her problem resulted in part from lack of coordination between her breathing and her attempts to form a sound, so I asked her to tap her finger as she tried to make a sound. Just that rhythm imparted enough coordination to gain some success, and soon she could sustain the tone for longer.

Once Mary became aware of her increasing ability to alternate breathing and making sounds, in a pattern cued by her tapping finger, she carried this ability over to pacing syllables and short phrases in speech. Before she started music therapy, she could articulate three-syllable phrases with the help of some cueing to breathe at the initiation of the phrase. She also knew the skills she needed to succeed: breathe, speak slowly, exaggerate articulation, and make a syllable-by-syllable attack. She could repeat single words and phrases, albeit with many attempts at self-correction.

In her music therapy sessions, we asked Mary to sing short phrases—five to six words—with the melodic line matching the natural contour of the spoken phrase. The rhythm provided a natural timing mechanism for her breathing, and the melody enabled her to lend a more natural sound to the phrase. In a relatively short time, Mary was applying these techniques outside of therapy and speaking longer, clearer phrases and even sentences.

WORDS SPOKEN AND SUNG

Because music has parallels to spoken language, much research on music and the brain has zeroed in on the similarities and differences between them. The similarities could be clues to more successful methods of using musical cueing to stimulate similar language responses in people with brain injuries. One remarkable example of the functional difference between music and language, however, occurs in people who have suffered a left-side stroke, resulting in a type of aphasia where verbal comprehension still exists but the ability to speak or find the right words is lost. In these cases, the brain lesion is often located in what is called Broca's area; speech is slow, not fluent, and hesitant, with great difficulties in articulation. Yet, despite the loss of speech, many people with this type of aphasia can sing complete lyrics to familiar songs. This has usually been attributed to the separation of function of the left and right hemispheres of the brain, speech being dominant on the left and singing on the right.

Because many clinicians assume a complete separation of function between singing and speaking, they give little attention to the potential for using music to aid speech. But there are several cases in which a patient has recovered speech through the systematic use of rhythmic patterning, leading first to recovery of familiar lyrics and words embedded in songs, then to self-initiation of normal, fluent speech. In each case, however, this remarkable change had been attributed not to the music but to spontaneous recovery during the early months after the stroke.

A similarity shared by music and speech is what we call "prosody," which includes the elements of stress, pitch direction, pitch height, and intonation contour, or inflection. People with nonfluent aphasia can perform a type of prosodic speech that includes the inflection and contour of previously known phrases. This speech differs, however, from propositional speech (which includes verbal expression of new thoughts and ideas) in its rate, discrete pitch, and increased predictability. Aniruddh D. Patel, PhD, a scientist at the Neurosciences Institute in California, theorizes that rhythm and song, which are inherently predictable, may create a "supra-linguistic" structure that helps cue what is coming next in an utterance.

Brain-imaging studies by Dr. Pascal Berlin, of the Service Hospitalier Frederic Joliot in France, and more recently by Dr. Burkhard Maess at the Max Planck Institute of Cognitive Neuroscience, used PET and MEG scans to determine that areas peripheral to the left language regions of the brain are involved in processing the singing of single words. Additional imaging studies suggest that some aspects of music and language are processed in both the right and left sides of the brain. In many patients who are able to carry over speech techniques from music, success seems to come from their increased ability to attend to sounds and to initiate them, perhaps because parallel mechanisms for these functions have been called into play by music and singing.

COURTESY OF CONCETTA M. TOMAINO

For people with neurologic impairments or diseases, music therapy can be an essential first step in recovering functions such as speech or the ability to experience emotion. Scientists are beginning to discover how the elements of music may aid in this process. It is rare for someone to lose all capacity to experience rhythm, harmony, pitch, melody, or other aspects of music.

SALLY: OUT OF SILENCE, A REMEMBERED SONG

Just as rhythm can affect motor function and the initiation of movement, a familiar tune or melody can reawaken in persons with dementia, or with traumatic brain injury, seemingly lost memories and feelings. We are so much the sum of our experiences and memories that we cannot help associating each new experience with something that came before it. Imagine how the world must seem to someone with no memory link from past to present. But sometimes music can provide a bridge.

Sally had been diagnosed with leucoencephalopathy. She was mute; apart from crying, she made no vocal sounds. She spent her days pacing the long nursing home corridor and crying. Although she seemed to have lost the ability to recognize objects, she navigated well. If she walked into something, including a person, she would touch it and immediately seem to identify its purpose. One day, as I played some tunes to other residents, I was surprised to hear a beautiful voice singing the complete lyrics to the song I was playing. I turned to the door to see Sally dancing and singing her way into the room.

Later, I telephoned her sister and learned that Sally had played the piano; she had loved to entertain at parties, singing many of the songs I had been playing for the residents. Nevertheless, Sally's sister was astonished at what I reported, because Sally had fallen mute long before her illness was fully diagnosed. The nursing home staff began singing to Sally every day; she sang back in a kind of chanting tone. Her crying stopped, as did her restless wandering of the halls. Soon she began speaking and became more integrated into the world of the nursing home.

We do not know specifically how music affects memory, but most of us experience that effect every time we hear a favorite song. Indeed, music is capable of arousing in us deep and significant emotions. Memories of music can be so well preserved that the merest fragment of a melody stimulates recall of the song's title or lyrics. Emotionally charged responses to familiar music are probably the result of connections from the auditory nerve to key limbic structures in the brain. The limbic area, which is associated with emotion, includes the olfactory cortex, amygdala, and hippocampus. The amygdala gets its input from our senses and directly affects our autonomic responses; it is also involved with our moods through interconnections with the frontal cortex and thalamus. The hippocampus plays a significant role in storage of factual information, including conscious (declarative) memory.

Because memories persist when they have personal significance, the emotional content of music seems to be processed immediately, even by people with severe dementia. Is this a possible pathway we can use to reach their sense of self? Ernest G. Schachtel said in 1947 that memory, as a function of the living personality, can be understood only as the capacity to organize and reconstruct past experiences and impressions in the service of present needs, fears, and interests. Just as there is no such thing as impersonal perception and impersonal experience, there is no impersonal memory. Thus, familiar songs may serve as cues to recall memories. People with dementia, who may have lost the capacity to process many types of information, including the ability to identify a song, may still respond to that song spontaneously and emotionally. In "Music and the Brain," Oliver Sacks writes that "it is the inner life of music which can still make contact with their inner lives which can awaken the hidden, seemingly extinguished soul; and evoke a wholly personal response of memory, associations, feelings, images, a return of thought and sensibility, an answering identity."

> While eating, crawling, and walking, each child finds a cadence, particular motor rhythms that will remain fairly consistent throughout life.

Observing how people with dementia respond to music gives us an inkling of how remarkable and instantaneous some of these subcortical processes are. But if, as pointed out earlier, the brain's processing of music is complex, involving many areas, what specific component of music does a person perceive and process to allow for these immediate responses?

In some instances, factual memories return. New research is shedding light on how this may happen. Ann Blood, PhD, Robert Zatorre, PhD, and their colleagues at the Montreal Neurological Institute investigated the brain mechanisms involved in emotional responses to music. They found that regions previously identified with pleasant or unpleasant emotional states (with the exception of fear) were activated in the para-limbic brain regions, rather than areas normally associated with music perception. Studies like this reinforce the concept of musical processing as a "whole brain" phenomenon. With the proper musical cue, we may gain access to another system, with enough overlap to jump-start similar areas that are now dysfunctional. That is, when higher cortical processing is compromised, there may be another way into the brain.

HARNESSING MUSIC'S POWER

Perhaps if we understood more about the relationship between the auditory system and other aspects of human cognitive function, we could reach more people like Sam, Mary, and Sally. For those with neurologic impairments and diseases like Parkinson's or multiple sclerosis, music therapy is only beginning to be recognized as a promising treatment. In its "Primer on Reimbursement," the American Music Therapy Association notes that music therapy is recognized as a viable treatment option, including in federal law and by accrediting agencies. It is included in the Older Americans Act Amendments of 1992 and the Individuals with Disabilities Education Act, and recognized by the Rehabilitation Accreditation Commission and the Joint Commission on the Accreditation of Health Care Organizations. Even so, the availability of music therapy for the whole range of situations where it could help is gravely limited.

Music therapists who do neurologic rehabilitation know that it is almost impossible to lose all aspects of music perception.

Although much is being discovered about music's effects on the brain's functioning, we have no cohesive, detailed theory of how this takes place.

The discovery that new networks and connections may be formed in the brain every time we learn a new skill has implications not only for early childhood development, but also for potential recovery of function after injury.

For example, what specific element of music aids in the recovery of language in a person with aphasia? Is it the articulation and rhythmic cueing of familiar speech patterns? Or does singing the lyrics stimulate and improve word retrieval for normal speech? How, specifically, does music affect retrieval of memories? When stimulated by music, what role do lower brain areas (the cerebellum, reticular formation, and others) have in the upward activation of higher cortical mechanisms?

The great Russian neuropsychologist Alexander Luria observed that what we know of brain function is based on what has been lost and what remains following a traumatic brain injury. Music therapists who do neurologic rehabilitation know that it is almost impossible to lose all aspects of music perception. Knowing how the brain processes the elements of music—rhythm, pitch, harmony, timbre, tempo, contour, loudness, spatial location, and melody—as well as associations and memories, and where overlapping or parallel regions share this processing, could support increased use of these components of music early in treatment, the better to take advantage of brain functions that have been preserved.

With the advent of new imaging techniques, we know that the brain is a dynamic, ever-changing system of interconnecting neurons that work in concert to produce our complex, dynamic responses to the world around us. The discovery that new networks and connections may be formed in the brain every time we learn a new skill has implications not only for early childhood development, but also for potential recovery of function after injury.

I will never forget one patient, admitted for short-term rehabilitation when he was in the early stages of dementia. He no longer could dress himself. He seemed not to have the fine motor skills to button his shirt, yet he could play the opening of the "Hungarian Rhapsody" on the violin. Both skills obviously had been used almost every day throughout this man's life, yet he had lost one and not the other. How can rehabilitation take advantage of such similar but subtly different functions?

It is highly unlikely, for example, that a symphony conductor and a tennis player would have the same motor skills and memories for movement in the left and right hands and arms, yet standard physical and occupational rehabilitation practices would treat them as identical. Conductors, at least the good ones, must be able to give two simultaneous signals that may convey completely different messages—for example, cueing the violins while setting the timing patterns for the percussion section. They will tell you that they can separate the functioning of their left and right sides. In musicians with these overlearned motor skills, certain motor neural networks and overlaying motor areas in the brain may remain intact even after a stroke, and could aid in earlier recovery of function or even development of compensatory mechanisms. But to help, we simply have to know more.

Both basic research and clinical investigations on the underlying brain mechanisms stimulated by different elements of music will continue. It is fairly safe to predict that we will discover that certain elements of music are processed in "primitive" brain regions, including some that are highly resistant to the ravages of traumatic injury and disease. Then we must ask: How do these deeper regions of the silenced brain, reached by rhythms or melodies of music, in turn stimulate the brain's higher regions (or bypass them) so as to switch on motor, cognitive, or emotion-related functions that had appeared lost forever? The answers will come, though no one can predict how rapidly, and then we may see more often—even routinely—what now seems (and is) a miracle: the man struggling to walk will dance; the haunted, weeping woman who walks the halls will rejoin us, singing; and the mind drained of its memories will know the comfort of a familiar old tune. ■

Concetta Tomaino is the executive director and co-founder of the Institute for Music and Neurologic Function and senior vice President for music therapy at Beth Abraham Family of Health Services, where she has worked since 1980. Tomaino is internationally known for her research in the clinical applications of music and neurologic rehabilitation. She is on the faculty of the Albert Einstein College of Medicine.

"How the Music Can Reach the Silenced Brain," by Concetta M. Tomaino. From Cerebrum, *January 1, 2002. Reprinted with permission from the Dana Foundation, Dana Press division, www.dana.org.*

Body, Voice, and Breath: The Corporeal Means of Music Learning

BY WILFRIED GRUHN

You may have noticed that children who accurately imitate pitch and maintain a steady beat often possess fine motor coordination. Is that something that merely happens accidentally or is there a neurobiological explanation? What do we know about the connections between bodily movement, and performance or perception? We might perceive solo performers to be expressive because of their movements while playing; we also might be attracted by the fluent movements of a conductor.[1] Vocalists are thought to be expressive not only because of their musical accuracy and artistry but also because their body movements coordinate in some way with their singing.[2] What can be witnessed in professional musicians might also be true of young learners. The coordination of the voice and breath, as well as the natural use of gestures and body movements, might determine the expressiveness of their communicative musicality.

BODY MOVEMENT AND EMOTION

The most fundamental connection between music and movement is emotion. The term "emotion" and its etymological root refers to motion that comes out of a human expression; all emotional states are expressed through facial and body movements. For example, trembling indicates fright, tense muscles indicate anxiety, a relaxed face indicates openness, and an upright posture indicates happiness. The body language that mirrors sound production often intensifies emotional states and transforms it into a vocal expression. Expressive performance requires bodily movement. In general, emotion is a core paradigm of expressiveness through motion.

What can be witnessed in professional musicians might also be true of young learners. The coordination of the voice and breath, as well as the natural use of gestures and body movements, might determine the expressiveness of their communicative musicality.

MOVEMENT AND LANGUAGE DEVELOPMENT

Language and movement development are also connected to each other. Pediatricians William Condon and Louis Sander from Boston University Medical Center discovered that even during the first days of life, human neonates move in precise and sustained segments that are in synchrony with the structure of adult speech.[3] In normal early mother-child interactions, the child is introduced to the syntactic segmentation of language through the movement that accompanies speech. Therefore, young children have already learned the basic structures of their mother language through movement long before they start to articulate their first words and sentences. Movement has been efficiently used in behavioral therapy with children who exhibit stunted language development.[4] Treatment does not start with exercising words and articulating syllables but rather with learning interactive movements. Movement is a powerful means of early speech and song development.[5]

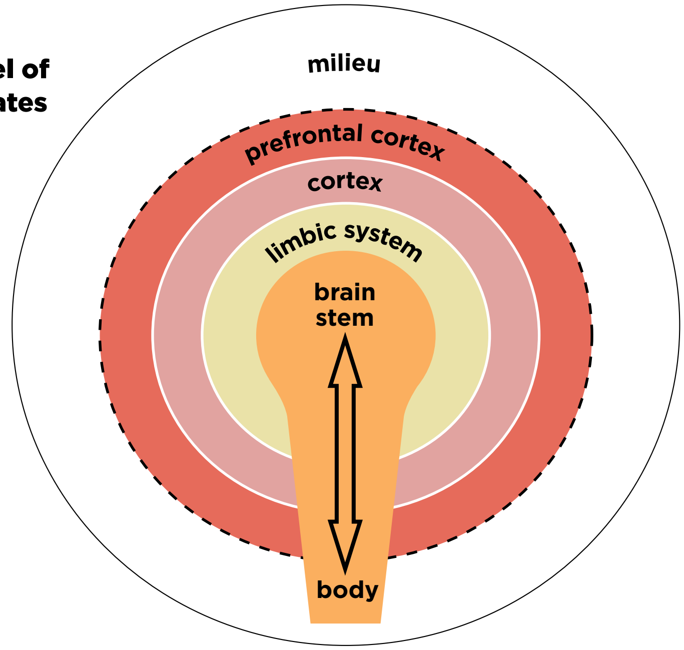
Face-to-face communication also provides additional semantic information. We get more information by watching someone speak than by listening to the voice alone. This is because the motor system of the brain is connected with the language processing areas to help in comprehension.[6] In recent years, researchers have argued that mirror neurons may play an important role in the interaction of motor control and sound imitation. Mirror neurons in the brain have been found to activate when a primate acts in a certain way and observes that same action performed by another. Therefore, mirror neurons might provide the missing link between motor activation and imitation.

This is particularly true with respect to audio-vocal learning that enables humans to reproduce sounds by ear (listening to a noise, pitch, or motif) and imitate them accurately just by listening. In audio-vocal learning, a special neural mechanism comes into play, connecting aural information and motor activation. For example, you might walk your dog every day to a meadow where a cow is grazing. When the dog notices the cow, he might bark. It would be preposterous to think that the dog would moo or the cow would bark. This is because each animal does not possess the neural mechanism to imitate other sounds. In order to imitate sounds, one must be able to integrate a perceived sound into a motor activity that governs the tension of the vocal folds so that the produced sound finally matches the perceived target sound. This process requires movement, the motor coordination to accurately imitate the sound of a given model.

FIGURE 1

The structural model of the brain demonstrates its different layers according to the evolutionary development. It also illuminates the strong connection between the body and the brain, which is also affected by the environmental conditions, called "milieu."

(WITH PERMISSION OF GERALD HÜTHER).



MOVEMENT AND BRAIN DEVELOPMENT

Whatever we do and however we act will engrave traces in the brain. This determines the process of developing mental representations. With regard to brain development, the brain stem and spinal cord constitute the origin of the ontogenetic development. There is an inseparable link between nerve transduction (the process by which a cell converts one kind of signal into another) and the oldest and earliest part of the brain (the so-called reptilian brain) which controls all unconscious, vital functions. Spontaneous movements impact the neural brain structure, even *in utero*. The movement evokes an arousal pattern, which leads to the development of neural representations. With further development another layer arises, the limbic system, which first emerged in mammals to evaluate experiences effectively before conscious recognition can emerge (especially in case of danger or threat). Finally, the neocortex appears in primates with two hemispheres where all conscious targets are planned and executed. This very basic model of the evolution and structure of the brain, which is shown in Figure 1, reflects how any experience and sensorial input can only effect the brain through corporeal sensations. The ways in which we act and the things we do engrave traces on the brain; through this process, we develop mental representations.

How do we acquire musical representations of sounds, pitches, durations, meters, and timbres? As all educators intuitively know, music is not acquired and performed by theoretical concepts and knowledge *about* music; rather, it's acquired through practical experiences—actively making music.[7,8] We cannot *explain* what a resting tone or an upbeat is unless we perform it. When we explain music verbally, we are not teaching music as a sound object. For musical understanding, students must feel and experience the sound and tension of a musical line. When music is integrated into the body and mind it becomes a part of our students. Here is an example: A child is jumping rope to a steady beat. She has to coordinate her muscle movements and breath so that the muscle tension of the jump can be executed at exactly the moment of an anticipated downbeat. This requires a complex series of actions that must be coordinated and planned both physically and cognitively. This cannot be taught through verbal or theoretical explanations about the rules of anacrusis and steady beat.

Children mature by experiencing their environment, but in a different way compared to adults who count and measure everything of their living condition such as time and space.

MOVEMENT IN MUSIC LEARNING

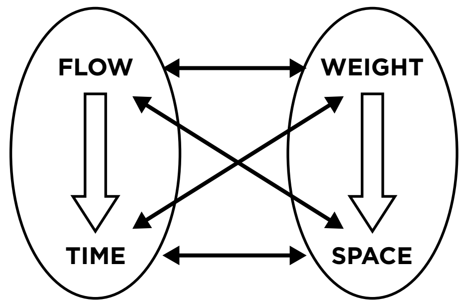
I would now like to clarify how this sensorial input forms a stable neural representation. Imagine we are observing people at a fair.[9] There is a food stand in one corner, a gift shop in another corner, and a restroom in yet another. Some people might go to the gift shop, then move on to the food stand, and finally visit the restroom. Others might choose another order. Over time, a few clear pathways may appear according to the most frequently used routes. Something similar occurs in the brain with neurons that are specialized to process particular information (such as pitch or loudness). They connect with one another and build so-called cell assemblies and, ultimately, larger neural networks. Connections that are used more often become stronger, whereas those not used might disappear. Action and use create the structure of the brain, which is extremely variable over time. The ability of the brain to change with learning, to reorganize neural pathways based on new experiences is called plasticity. The brain is shaped according to the challenges to which it is exposed intensively. Connections between single neurons grow stronger and become more stable.

What is true for the brain in general is especially true for the musical brain. Continuous and deliberate practice from the early years shapes the brain. There is no particular musical part of the brain, but many brain areas that are involved in processing music and governing musical activities—such as moving and dancing along with music; correcting pitch; synchronizing rhythm; playing an instrument; training finger movements and hand fluency, listening and enjoying music; recognizing intervals and tonalities, etc. Each particular task results in an altered brain structure and function.

Young children mature by experiencing their environment in a different way than adults. Adults are typically more cognitively aware of things and measure time and space. On the other hand, children perceive and experience time and space through weight and flow of their bodies. This very basic conception can be traced to the dancer Rudolph von Laban, who systemized the harmonic structure of space and movement.[10]

FIGURE 2

Schema of the interaction among time, space, weight, and flow as the prominent means of children's modes of experience. The arrows indicate the mutual interdependence of the four categories.



Children experience space and time through their bodies, using large muscles to feel the weight of their body and while performing sustained continuous movements. They experience time as flow (i.e., as a continuous stream of movement), and they experience pulse as different degrees of weight. When they sing or chant, they move their muscles (vocal cords) according to the sound in their mind. They also move along with the melody in free-flowing continuous movement reflecting the flow of time. When children move, they begin to impose musical time on space. They experience musical time as they perform a rhythm correctly in synchrony with the beats.[11] While adults measure time and space, children feel the weight of their body in space and move it in sustained flow. Therefore, these modes of exploring the environment interact, as seen in the arrows in Figure 2.

If music learning can be understood as a bodily experience, then singing and chanting and moving and dancing seem to be critical means and should be implemented into the curriculum for instrumental and general music instruction of all sorts.

A STUDY ON MOVEMENT

In a study, we observed the motor activities of young children between three and five years of age.[12] These included sustained flow of movement, coordination, synchrony of movements with other children or a teacher, and vocal abilities. The highest level of correlation was found between coordinated and synchronized movements, and the accuracy of the performed rhythm patterns, the consistency of tempo, and the correct intonation (pitch-matching) in songs and patterns. This was surprising because we had not expected such a strong connection between singing and movement. This positive relationship may have emerged because children who were singing and chanting often and precisely as well as keeping a better steady beat were also developing their ability to coordinate fine and gross motor skills. The same motor ability that is needed for the coordination of actions is also applied to singing and chanting. Therefore, the better the ability for motor control in gross movements, the better the fine motor control in the vocal tract can grow, resulting in better intonation. This means that motor control might be a solid explanation for the interaction and may function as the link between movement and vocal production. Developing better intonation is no longer only a matter of ear training and repeated practice. Movement could serve as an adequate approach to gaining results in accuracy and intonation.

TABLE 1

Correlation coefficients indicating significant (*) or highly significant (**) correlations between vocal and motor activities in young children.

MOTOR CRITERIA	VOCAL CRITERIA: *rhythm patterns* consistent tempo	*rhythm patterns* accuracy	tonal patterns intonation	*songs* pitch	*songs* rhythm
flow	.77*	.74*	.86**	.84**	.83**
coordination	.80**	.74*	.81**	.70*	.70*
synchronization	.82**	.80**	.91**	.81**	.81**

Although many research questions still remain, we should always keep in mind that voice, breath, and body movement play prominent roles in formal and informal learning processes.

Wilfried Gruhn is professor emeritus of music education at the University of Music Freiburg and former director of the Gordon-Institute in Freiburg, Germany.

[1] Catherine J. Stevens, Emery Schubert, Shuai Wang, Christian Kroos, and Shaun Halovic, "Moving with and without Music: Scaling and Lapsing in Time in the Performance of Contemporary Dance," *Music Perception*, 26 no. 5 (2009): 451–464.
[2] Steven R. Livingstone, William F. Thompson, and Frank A. Russo, "Facial Expressions and Emotional Singing: A Study of Perception and Production with Motion Capture and Electromyography," *Music Perception*, 26 no. 5 (2009): 475–488.
[3] William S. Condon and Louis W. Sander, "Neonate Movement is Synchronized with Adult Speech: Interactional Participation and Language Acquisition," *Science*, 183 (1974): 99–101.
[4] Steven Malloch, "Mothers and Infants and Communicative Musicality," *Musicae Scientiae*, *Special Issue* (1999–2000): 29–57.
[5] Wilfried Gruhn, "The Audio-vocal System in Song and Speech Development," in Roland Haas & Vera Brandes (Eds.), *Music that Works* (New York: Wien, 2009): 109–117.
[6] J.I. Skipper, S. Goldin-Meadow, H.C. Nusbaum, and S. L. Small, "Gestures Orchestrate Brain Networks for Language Understanding," *Current Biology*, 19 no. 8 (2009): 66–667.
[7] David J. Elliott, *Music Matters. A New Philosophy of Music Education* (New York: Oxford University Press, 1995).
[8] David J. Elliott (Ed.), *Praxial Music Education. Reflections and Dialogues* (New York: Oxford University Press, 2005).
[9] Manfred Spitzer, *Selbstbestimmen: Gehirnforschung und die Frage: Was sollen wir tun?* (Heidelberg: Spektrum Akademischer Verlag, 2008).
[10] Rudolph v. Laban, *Choreutics* (Wilhemshaven: Noetzel, 1991).
[11] Edwin E. Gordon, Buffalo. *Music Learning Theory: Resolutions and Beyond* (Chicago: G.I.A. Publ. Inc., 2006).
[12] Wilfried Gruhn, "Phases and Stages in Early Music Learning. A Longitudinal Study on the Development of Young Children's Musical Potential," *Music Education Research*, 4 no. 1 (2002): 51–71.

BY SHIH-YU JADE PAI

Songs that Children Sing: Clues about Innate Musicality and Cultural Influence

INTRODUCTION

Before I started my ethnomusicology study, I was an evolutionary biologist, counting fruit flies behind the microscope. I was trying to select for a higher cold resistance in fruit flies by exposing them to the cold for several hours each fly generation. After ten generations of such manipulation, the cold-selected flies were able to produce more progenies than the non-selected flies after a short exposure to the cold. By manipulating the environment, I was able to change the genetic disposition of the population toward a more stress-tolerant one, and hence change the observable characteristics—what biologists call *phenotype*[1], or in this case, the fertility after the cold stress.

As an ethnomusicologist, the experiment got me to think about music in a very different way, not as the popular culture, traditions, or a label of identity, but as a biological phenomenon. Music, as the cold tolerance of the fruit flies, is a *phenotypic product* that is the result of the ongoing interaction between environmental conditions and genetic predispositions. "Environmental conditions" include not only the natural environment, but also the human environment, which could be the soundscape or even culture. Without this external input, what a person sings represents his innate musicality, which is the result of pure genetic predisposition. I began to wonder just exactly how these two factors—environmental condition and genetic predisposition—influence our music making. This article is a summary of my first attempt to answer this question.

Among the many types of music making, I decided to focus on singing because it is the earliest form of music making and requires no explicit learning, unlike playing an instrument. What interests me most is song *style*. The way a person sings is a combination of the soundscape and their own innate musicality. How does each of these two factors affect our vocal style?

The most direct way to answer this question would be to put individuals in isolation—to exclude the environmental factor so we could discover the innate musicality. Humans are not fruit flies, however. Having realized that there is no direct approach, I have chosen an alternative method, which is to listen to what children sing. Although children are also situated in vibrant soundscapes, there is still a compelling possibility that part of what they sing would reflect innate musicality, considering that they have spent cumulatively less time on earth than adults.

SOURCE AND METHODS

For my master's thesis[2] I transcribed and analyzed one-hundred children's songs[3] from various parts of the world: Nepal, Thailand, Malaysia, Indonesia, South India, South America, Guinea-Senegal, Brazil, China, Bulgaria, Madagascar, Romani France, Mauritania, Cameroon, and Taiwan. This sample was selected from two compact disc series: *Le Chant des Enfants du Monde* (Children's Songs from Around the World) and 台灣原住民之歌 (The Songs of the Taiwanese Aborigines), produced by the ethnomusicologists Francis Corpataux and Wu, Ron-Shuan, respectively. I selected mostly songs that are meant to be sung on playgrounds, such as game songs, or songs that are sung by really young children. Because of the possibility that these songs were made up by children, they are less likely to be influenced by cultural style. The texts are omitted because the focus of the analysis was the musical elements.

The analyses focused on five areas: tonality; meter; melody; structure and grouping; and means of ending. Under each area, I have analyzed specific properties, such as scale. Pooling the data from one hundred songs, I have drawn out major tendencies and the relationship between these tendencies and the origin of the songs. In the following paragraphs, I will summarize the findings.

TONALITY

I designed two ways to analyze tonality. The first is to decide if a song was based on a "traditional" tonality, such as diatonic and anhemitonic pentatonic scales. A song could be classified as such even though one or two tones may be "missing," as long as they still retain the characteristics of that tonality. This analysis revealed that regions with a music tradition of anhemitonic pentatonic scales, such as Southeast Asia and China, have significantly more children's songs[4] sung in this scale than a diatonic scale. In regions with a tradition of diatonic scales such as Europe, all of the songs were sung in this scale exclusively (Table 1). One can see that children's use of scales is strongly influenced by their soundscape.

The other method of analyzing tonality is to simply count the number of tones. A third of the children's songs use a five-tone scale, and only less than a quarter of the songs use a seven-tone scale. Fifty-six percent of the songs use five tones or less. This is a surprising discovery, because if children's use of scales were strongly influenced by the environment as shown above, one would expect most of the songs to have either five or seven tones, since most music traditions use either an anhemitonic pentatonic or a diatonic scale.

All of the pitches used in a song do not seem to have equal importance.

SCORE 1. *YOFO YO.* Guinea-Senegal

Usually one pitch, which I call the "home note" and can be thought of as the tonic in Western music, has a special structural importance—more than half of the songs return to the home note at the end of phrases.

THE NON-RANDOM USE OF THE TRITONIC SCALE

Incidentally, four out of five songs using a tritonic scale have the same pitch relationship of *do-re-la* (Score 1). I suspect that this is not simply a coincidence. One possible explanation is through "spreading." "Spreading" is a term used by linguists to refer to a sound trait that moves from one population to another by means of contact. In other words, one would expect to find two neighboring populations share a number of sound traits because of frequent contact. Referring back to the data, this was not the case, however. These songs came from Peru, Guinea-Senegal, Brazil, and Brittany, and there is no geographical connection between them.

The second possibility is contact through media, instead of physical contact. During the past century media has become a bridge between cultures, which makes sound exchange possible without physical contact. This is a highly possible scenario, *if* the songs were composed *after* the rise of media. If all of these songs were composed *before* the use of media, the creation of each was independent, without the influence from the others. At this point, I suspect that since both CD series were meant to represent traditional songs, the compositions have a historical root deeper than the media.

The third possibility is that this pitch relationship is an innate, universal preference, so that it repeatedly and independently comes up in various cultures. It is a likely explanation but one needs a larger sample size, as well as date and origin of the compositions to prove this theory.

METER

Most of the songs use a binary meter (Table 2). Of the songs that use 12/8 meter, ninety percent are of African origin. As 12/8 meter is ubiquitous in African music, the importance of cultural influence is confirmed again.

Among the samples, there were two songs sung by a Thai girl that I could not stop myself from listening to. Both songs have a half-sung, half-spoken quality. *Poo Noi Meu* (Score 2) is a singing game and *Sier Punk* is a nursery rhyme about rain. They are good examples of songs without a clear meter. It is not to say that they are not rhythmic, as the timing between

TABLE 1. USE OF DIATONIC AND ANHEMITONIC PENTATONIC SCALES IN DIFFERENT REGIONS

	Diatonic	Anhemitonic Pentatonic	Others	Total
Southeast Asia	6	18	4	28
India	5	1	2	8
Africa	9	9	9	27
Europe	7	0	4	11
China	1	7	0	8
South America	7	2	9	18

TABLE 2. TYPES AND DISTRIBUTION OF METERS USED IN ONE-HUNDRED CHILDREN'S SONGS

Type of Meter	Specifics	Number of Songs	Total Number of Songs
Binary Meter	2/4	9	69
	4/4	60	
Meter with Ternary	12/8	10	11
Subdivision	18/8	1	
Ternary Meter	3/4	2	4
	6/4	2	
Others	5/4	3	5
	sectionalized	2	
Unclear Meter	N/A	11	11
			Total = 100

SCORE 2. *POO NOI MEU.*

Thailand

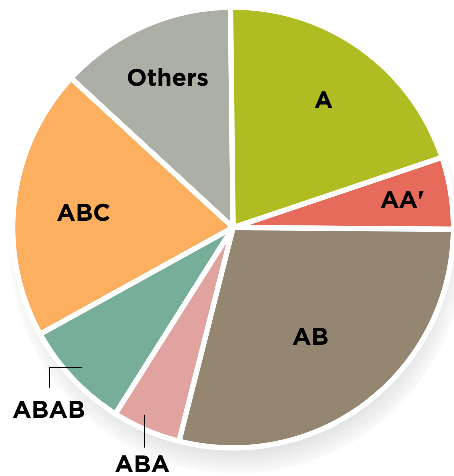
syllables is clearly regular. Rather, the lengths of the musical phrases seem to be governed by the lengths of the text phrases.

MELODY

Three melodic elements—range, phrase length, and contour—were analyzed. Most of the songs are within one octave, with the average phrase length between four to five quarter notes.[5] These two characteristics, small range and short phrases, seem to be present in the majority of children's songs. The few exceptions that I encountered resemble the "adults' songs" of their respective societies. A song from India used extensive ornamentations, which are rarely found in any other children's songs, but very common in classical Indian music.

I found that there is no general tendency in the contour of the melodies. However, one finds more "upward" movement at the beginning of the songs and more "downward" movement at the end.

FIGURE 1. RELATIVE PROPORTION OF BASIC STRUCTURES FOUND IN ONE HUNDRED CHILDREN'S SONGS.



STRUCTURE AND GROUPING

Most songs are composed of simple structures (Figure 1). Songs that are composed of more than three distinctive sections (ABC) either go on to a new section or return to a previously occurred section.

MEANS OF ENDING

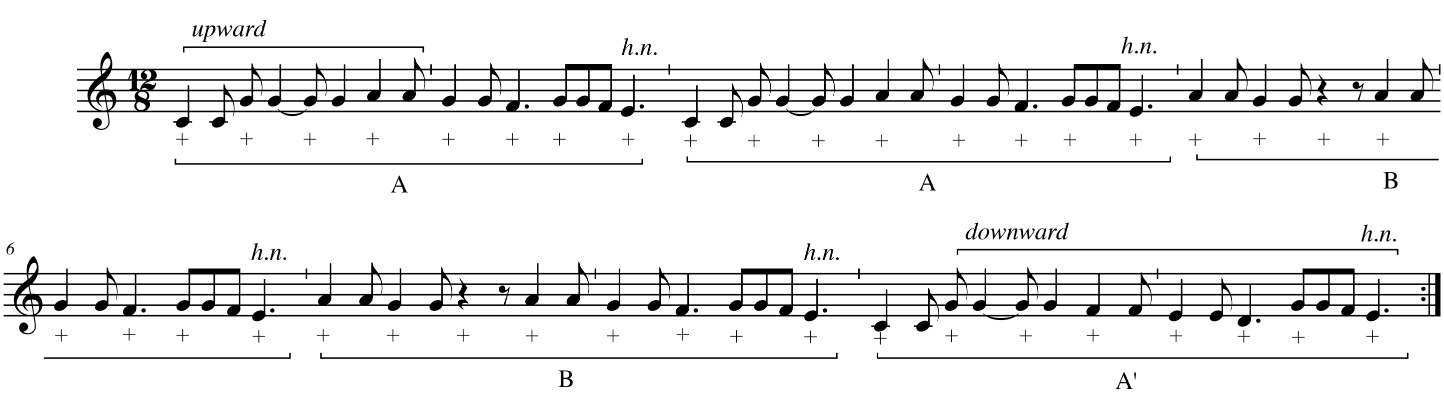
As Coral Davies has observed in songs that children made up, children's songs usually have a means of ending, as opposed to just stopping.[6] There are several ways that they use to achieve the feeling of an ending: returning to the "home note," repeating or returning to a previously occurred section, slowing down the tempo, going down the contour, and having a section of spoken text. I found the last one particularly unique to children's songs, especially the game songs.

SYMMETRY IN CHILDREN'S SONGS

From what I have observed, many children's songs could be described as "symmetrical" in a number of ways (Score 3). Melodically, some have an "umbrella-shaped" contour (up and then down). Structurally, some have the same beginning and ending section (ABA, for example). Tonally, the "home note" appears at the beginning and at the end.

SCORE 3. *D'ANYE BARA.*

Guinea-Senegal



'+' represents clap
h.n. = home note

CONCLUSION

In summary, most children's songs follow a specific pattern: a small number of pitches in which the home note frequently appears at the end of phrases, binary meter, small range, short phrases, contour that has an upward shape at the beginning and a downward shape at the end, simple structure, symmetry, and an ending achieved through cadence, ending section, or contour. While these characteristics represent the majority of children's songs, there is still a surprising amount of diversity. Each song is unique through its own use of musical materials. Such diversity in musical character was not something I expected to find at the beginning of my research.

Although there are a few clues about the source of children's musical style—cultural influences or innate musicality, most of the things I have discovered have left me in a deeper wonder. There are still too many unknown factors. Were the songs composed by children or for children? Do they represent a preference or originality? Is there a universal innate musicality? Are certain musical characteristics more easily influenced by culture than others? Why are children's songs symmetrical? These are just the beginning of the list of questions. In the hope of disentangling cultural factors from biological ones in music making, I found myself more deeply entangled in this web of currents, driving and molding the musical styles, which we know today. This study has asked more questions than it answered about music making. Yet, I hope it also encourages all who love and care about music to ask more questions in the search for answers. ■

Jade Pai is a researcher and musician. She is interested in the development of music from biological and archaeological perspectives. She also loves to play gamelan and mbira because they are beautiful and challenging for her Western-music-oriented musicality.

BIBLIOGRAPHY

Davies, Coral. "Listen to my song: a study of songs invented by children aged 5 to 7 years." *British Journal of Music Education* 9, no. 1 (1992): 19–48.

Johannsen, W. "The Genotype Conception of Heredity." *The American Naturalist* 45, no. 531 (1911): 129–59.

Pai, Shih-Yu Jade. *Discovering Musical Characteristics of Children's Songs from Various Parts of the World*. Master's thesis, The University of British Columbia, 2009.

DISCOGRAPHY

Corpataux, F. (Producer). *Le chant des enfants du monde*. ARION.

Wu, R. (Producer). 台灣原住民之歌 (*The Songs of the Taiwanese Aborigines*). Wind Records.

---

1 W. Johannsen, "The Genotype Conception of Heredity," *The American Naturalist* 45, no. 531 (1911): 129–59.

2 Shih-Yu Jade Pai, *Discovering Characteristics of Children's Songs from Various Parts of the World* (master's thesis, The University of British Columbia, 2009).

3 Here, "children's songs" refers to any song that was *sung* by children. Although it would be very valuable to distinguish between songs that *originated from* children, songs *made for* children, and songs that have neither the originality nor the intention for children, it was unfortunately impossible not having done the field work myself.

4 Here and in the following paragraphs I will use the term "children's songs" to specifically mean the sample of one hundred songs.

5 To make a comparison, all songs were arbitrarily converted to a quarter note unit. For songs that used a ternary subdivision (12/8), every three eighth notes were converted to one quarter note. The emphasis here is the number of *tactus*, and not the mathematical values.

6 Coral Davies, "Listen to my song: a study of songs invented by children aged five to seven years," *British Journal of Music Education* 9, no. 1 (1992): 19-48.

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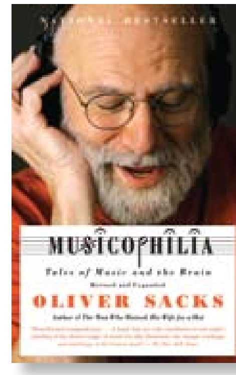

Musicophilia: Tales of Music and the Brain

By Oliver Sacks
Vantage Books, 2007

Oliver Sacks is a practicing neurologist and professor of neurology and psychiatry at Columbia University Medical Center. This background, plus his knowledge of music and a strong empathy for his patients, make him uniquely qualified to tackle the subject of this book. In *Musicophilia*, Sacks shares his professional experiences in a very warm and personal way that results in a clinically based narrative that doesn't require scientific training to be understood.

The first case study in the book relates the experience of a man who was struck by lightening and subsequently developed a passion for music that was totally new to him. Considering the odds of being struck by a bolt from the blue, I began my reading with a bit of skepticism about the relevance of this book to someone working with a population of "normal" school children. This apprehension was not immediately eased as I read about people with exceptional medical conditions: seizures triggered by music, hearing loss resulting in amusia (inability to hear specific pitches), musical savants, or people with such powerful synesthesia that pitch, timbre, or harmony were overpowered by visions of colors when hearing music. None of these are normal conditions encountered in my teaching experience.

However, throughout the book the telling of these exceptional stories invites the reader to reflect on the relationship of music and the workings of our brains. The chapter titled "Music on the Brain: Imagery and Imagination" will be of great interest to any music educator. Why is it that some people are naturally musical geniuses (Mozart comes to mind), and is there such a thing as an unmusical child? Sacks states that virtually everyone experiences involuntary musical imagery. Why is music such a universal part of the human experience? "There is clearly a wide range of musical talent, but there is much to suggest there is an innate musicality in virtually everyone" (p. 101).

> "There is clearly a wide range of musical talent, but there is much to suggest there is an innate musicality in virtually everyone."
>
> **OLIVER SACKS**

In a later chapter on absolute pitch, he suggests that the ability may be common in all infants but may become maladaptive later in life. A study by Diana Deutsch shows that children who grow up speaking a tonal language (i.e., Chinese) met the criterion for absolute pitch at a much higher rate than non-tone language speakers. Early music training, in addition to speaking a tonal language, increased the rate at which students met the criterion. Non-tone language speakers were also more likely to meet the criterion if they began music study early, but not nearly at the rate of tonal language speakers. Deutsch and her colleagues believe that absolute pitch played a critical role in the evolution of both speech and music.

A fascinating pair of chapters deals with catchy tunes and musical hallucinations. Most musicians have experienced ear worms that "just come to us" and will find this section of the book to be very relevant. Involuntary repetition of movements, sounds, or words tends to occur in people with Tourette's syndrome, or obsessive compulsive disorder, or after damage to the frontal lobes of the brain. But the automatic, internal repetition of musical phrases is almost universal in people without any triggering medical condition. This common experience, says Oliver Sacks, is "the clearest sign of the overwhelming, and at times helpless, sensitivity of our brains to music" (p. 49).

Many perfectly healthy and otherwise normal musicians experience musical hallucinations, at least on a temporary basis. I find myself unable to sleep for most of a week after singing a set of choral concerts; fragments of music run in an endless loop in my head. Sacks cites research by Jerzy Konorski, a Polish neurophysiologist, suggesting that the mechanism producing hallucinations is built into our brains. It is fascinating to learn that musical fragments naturally make their way into the thalamocortical systems that underlie consciousness and self. For Konorski, the question is not why a person experiences hallucinations, but rather why we don't experience them all the time. Normally, we have mechanisms that block the hallucinations, but these may be inhibited by a loss of sensory input from eyes, ears, and other sense organs, which allows the unbidden music to be released in our conscious state. For some people, this is a permanent and debilitating condition.

In addition to descriptions of people with conditions most of us hope to never experience, Sacks also describes how rhythm and movement served to heal him after a serious climbing accident. Through this event he learned that music could override the nervous system in the act of healing the body. A chapter entitled "Speech and Song" offers dramatic examples of the role of music as therapy for aphasia. The final chapter, "Music and Identity: Dementia and Music Therapy," is a fascinating window into the power of music as an emotional and physical healing tool.

In his preface, the author quotes Charles Darwin: "As neither the enjoyment nor the capacity of producing musical notes are faculties of least use to man … they must be ranked among the most mysterious with which he is endowed" (p. x). Music, says Sacks, is hardwired into us and is central in every culture. This book is a fascinating exploration of ways in which humans process, use, create, and simply enjoy music. This is an emerging area of scientific research, and I hope there will be many more books that elaborate further on the mysterious capacity of humans to produce music. ■

***Marjie Van Gunten**, former member of* The Orff Echo *Editorial Board, recently retired after forty years of teaching. She now lives in a meadow by the sea surrounded by the songs of birds and the rhythmic dance of waves.*

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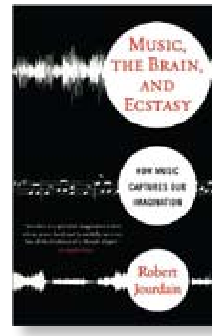
REVIEWED BY DOUG GOODKIN



Music, the Brain, and Ecstasy: How Music Captures Our Imagination

By Robert Jourdain
Harper Perennial, 1998

As music teachers planning tomorrow's classes, we rarely pause and think: "What is the evolutionary function of music? How does the brain process musical information? What makes the sound of an oboe beautiful?" We're probably more concerned with checking Jessica's understanding of triplets, writing out the sax part, or remembering where we put the recorder cleaner. But it's always a good idea to step out of the day-to-day fray and step back to think about the larger dimensions of our craft. And Robert Jourdain's remarkable book will help us do just that.

Jourdain comes to the subject as both a scientist and a musician and this is his strength, understanding how to connect the dots between findings in the laboratories and the intuitive experiences of musicians. In the twelve years since its publication, there is undoubtedly new information to supplement this comprehensive survey of music and the brain. But his most important points are made by supporting what is timeless about human learning, thinking, and comprehension and thus, show no signs of being outdated. Most importantly, it is a captivating read— thoroughly investigated, well-organized, and eloquently expressed. He moves chapter-by-chapter from sound to tone to melody to harmony to rhythm (this latter a surprise—I always put rhythm before melody, but he presents an interesting case for his choice) and then continues from composition to performance to listening to understanding to ecstasy. (This last quality in the progression is not often found in school curricular goals, but is a good reminder that ultimately, we are in the business of bringing joy to children and helping them feel a connection beyond themselves.) Each chapter is sufficient unto itself, but also builds from the previous one.

The prose moves seamlessly from anecdotes to quotes from composers to information about how the brain works and processes information. He admirably resists simple conclusions and constantly emphasizes the complexity of brain functions while still arriving at some concrete conclusions. Though Jourdain gives some examples of music and musical experiences in diverse cultures, he draws most heavily from the European classical tradition. As he himself admits, "…nearly all research charting the brain's musical behavior has been performed on Western subjects, usually well educated, and using musical examples from the so-called common practice period of Western music. No one knows how differently the brains of an average Indonesian or Nigerian might function listening to their own music…" (p. 282). Indeed, the book is at its least plausible when it makes generalizations about composition that don't take into account the variety of musical thinking in the world, including our own jazz and popular music tradition. Yet within its Western bias, there are stories that inform, intrigue, and enchant—Mendelssohn and Saint-Saens as child prodigies even more impressive than Mozart, Ravel's amusia in the last years of his life, Schumann suggesting composing away from the piano, Stravinsky suggesting composing at one. Indeed, the chapter on composition is one of the highlights in the book.

There is much here to both inform and affirm our work as Orff Schulwerk teachers. For example: "Children are expected to draw pictures and write stories when they're sent off to school. But when it's time for music education (and there isn't much of it these days), the emphasis is on playing music rather than making it up. But developmental psychologists have demonstrated that children readily become little composers when encouraged and supported" (p. 186). Sound familiar? Someone named Carl Orff had the same idea: "Let the children become their own composers."

Elsewhere, Jourdain states that "Around seven or eight, children begin to discriminate between major and minor keys. By ten, a child can follow two parallel voices, and is able to recognize cadences. Full harmonic comprehension begins only at about the age of twelve, if ever" (p. 112). In the current discussion about whether to move from pentatonic to the modes or straight to functional harmony in our Level trainings, we would do well to keep this in mind. Going from pentatonic major and minor modes to diatonic ones, working with the parallel, contrary, and oblique voices in much modal music before arriving at harmony echoes the brain's developmental paths.

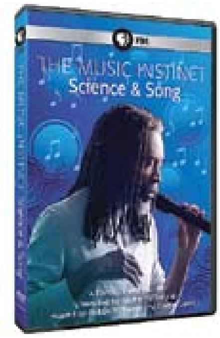
This book is well worth the time, turning us back to the beauty of our chosen profession while helping us to understand why it is so important for both ourselves and the children we teach. As Jourdain so eloquently states:

> The world is an untidy place. Where we would like to find simple patterns and deep connections, we encounter complexity and conflict and confusion. Only in a handful of activities, including music and the other arts, do our minds partake of experience that is so perfectly organized that every anticipation is roundly satisfied, filling us with intense pleasure. … Music makes us larger than we really are and the world more orderly than it really is. (pp. 318/331)

This read is a welcome reminder indeed. Now where did I put that recorder cleaner? ■

Doug Goodkin *has taught the San Francisco School for more than three decades.*

REVIEWED BY PAM HETRICK



The Music Instinct, Science and Song

A Film (DVD) by Elena Mannes, narrated by Audra McDonald
Hosted by Bobby McFerrin and Daniel Levitin

The music instinct? *Is* there a music instinct? The idea is intriguing. What does science have to say about the human brain and the way it processes music? Can music make us smarter? Can it heal? Is it reserved only for humans?

In summer 2009, PBS aired *The Music Instinct, Science and Song*, a two-hour program exploring recent scientific research on the brain and music. Hosted by musician Bobby McFerrin and neuroscientist Daniel Levitin, with guests including paleoanthropologist Steven Mithen, author of *The Singing Neanderthals* (reviewed in the fall issue of *The Orff Echo*), medical researcher Oliver Sacks, (see review in this issue), and musicians Yo-Yo Ma and Evelyn Glennie, the program is designed to introduce us to the latest research and ideas on the subject. The program may confirm what we music educators have already suspected, while opening the door to more questions and informing our practice.

The truth is, we don't know a lot about the brain. Watching this program is enticing because it presents a variety of current ideas, experiments, and research that may or may not lead to clearer understandings. With new ways of mapping what goes on in our brain, including MRI (Magnetic Resonsance Imaging) and PET (Positron Emission Tomography), we now know that music provides a gateway to learning about the brain. This is intriguing in itself. Why music? Up until the last few years scientists had mostly ignored the topic.

The program begins with the statement that the true power of music is greater than we knew; that music is encoded in our brains. With brain scans that show where blood or oxygen is flowing in the brain while performing and listening, scientists have discovered that there is no other activity that uses so many parts of the brain as music. We used to think there was a music center in the brain; however it is clear now that music is processed throughout the brain. Pitch, tempo, dynamics, and timbre, are routed to different areas of the brain. Levitin describes the way the brain processes sound as a kind of "neural symphony" coming together in 30/1000 of a second.

We used to think there was a music center in the brain; however it is clear now that music is processed throughout the brain. Pitch, tempo, dynamics, and timbre, are routed to different areas of the brain.

The DVD is divided into thirteen selections as well as twelve special features not seen on the televised program. The fifth selection, "Our Ancestors and Song," addresses the question of how long humans have had music. Steven Mithen takes us to the caves in Germany where bone flutes with four-finger holes were discovered in the summer of 2009, and describes how music must have been part of Neanderthal life. A visual of the shadows cast by firelight on the cave walls and the sound of human voices and flutes makes it easy to imagine what it might have been like. Go to *www.npr.org/templates/story/story.php?storyId=105823127* and click on "A simple song played on a replica of a vulture bone flute" to hear how this flute might have sounded. Interestingly, it produces a pentatonic scale.

Might there be a universal scale or rhythm that transcends time and culture? In the sixth section, "Music: Born and Bred," Kay Shelemay, ethnomusicologist and professor at Harvard University, cautions against looking for musical universals. What is universal in music and what is a product of our culture? Can we ever discover the difference? One study shown in the program seemed questionable. Cameroonians from the Mafa tribe who had never had contact with outside music were given recorded excerpts from classical music (played on a synthesizer) and shown four different faces expressing calm vs. anxiety, happiness vs. sadness (the faces were all white female, and Western). Because of their choices, it was inferred that, yes, there is something in this (Western classical) music that is universal. Bobby McFerrin's demonstration of the power of the pentatonic at the June 2009 World Science Festival is far more compelling: *http://vimeo.com/5732745* ("Notes and Neurons: with Schafer, Levitin, and McFerrin).

Other research that was particularly interesting was the study of neuroplasticity, the ability of the brain to mold itself (in section eight, "Music Changes the Brain"). The brain begins with millions of neurons that are then shaped by experience. These gradually link into neural networks. The brain apparently can change itself and its networks, and is capable of this throughout life. It has been found that the brain of a musician is physically different from others. The *corpus callosum*, which links both sides of the brain, is enlarged in musicians that began studying a musical instrument at an early age. They had improved auditory abilities as well as improved performance in scholastic areas such as vocabulary, syntax, and visual perception.

In another study, it was shown that the auditory and motor regions of the brain are closely linked. Amazing connections have been made with Parkinson's patients, who are able to move and sing almost normally to music while they may not be able to move at all without it. Other evidence that music heals is seen in section twelve, "Music and Language," where patients with aphasia—loss of speech from a stroke—are able to regain their speech through singing patterns.

Is music reserved only for humans? If you haven't seen Snowball the dancing cockatoo on YouTube, you can see him at the World Science Festival 2009 (*http://vimeo.com/5731849*). There's no doubt that this bird can keep the beat! Entrainment, the ability to move to a beat, was previously considered a human trait. How birds and whales use sounds (music?) is discussed as well.

Although this program generally adopts Levitin's view that music is hardwired into the human system, it presents other perspectives and makes no facile claims. Perhaps that is the greatest lesson offered here—to be aware of the possibilities brain research offers without falling prey to current fads. If we begin with Levitin's theory, that "song lies at the core of life," we're surely on the right track. ■

***Pam Hetrick** is a member of* The Orff Echo *Editorial Board and co-coordinator of this special issue on music and the brain.*

AOSA AV LIBRARY
VIDEO PREVIEW

REVIEWED BY BETH IAFIGLIOLA

Everyone Succeeds! Meeting the Needs of All Students in the Music Room

Presenter: Melissa Rozelle Reed ■ **AOSA AV Library:** 168MR (DVD format)

"There is nothing so unequal as the equal treatment of students of unequal ability."
– Plato

"As music teachers, we see everyone," says Melissa Rozelle Reed, a music teacher and music therapist from Hilton, New York, presenter at the 2008 AOSA National Conference in Charlotte, North Carolina. The Department of Education statistics state that 96 percent of general education professionals have students with disabilities in their classrooms, three or four students in many classrooms have Individualized Education Plans (IEP), and of those with disabilities, three or four special education students spend almost half of their day in the regular classroom.

Reed's session begins with a survey, asking participants if they have had formal training in working with disabilities. The result is that few have had the training and are looking to learn more. This session initiates the discussion by giving an overview of federal law, the rights and responsibilities of music teachers, the support required for children with special needs, some ideas for instrumental adaptations, and a list of resources that may continue the search for answers.

Reed gives a brief history of events that affected special education legislation. The most important statement she makes is that it is not the child's fault. A story about a mother's reaction to learning about the condition of her unborn child drives home the point. Attitude on the part of the adult in charge can make all the difference since not all disabilities will be a problem in the music room.

As a teacher of a child with disabilities, we have the right to *know* the student and the aspects of the disability, we need to decide *what* it means in the music class, and we must *learn* what to do to make the student successful. Reed uses the abbreviation "KWL" to help us organize the information. Later, she uses a four-domain grid, illustrating social/emotional, cognitive, fine/gross motor, and speech/language, to help the teacher create a plan for the child's success in the music room. Throughout the session, Reed encourages the music teacher to be part of the team process. Reed includes a thirteen-point list of disability categories and a list of common terms and definitions in the session notes. This helps the music teacher understand the language used in these legal agreements and become part of the decision process.

Reed concludes the session with some brief ways to adapt musical instruments, such as mallets and recorders. Reed encourages the music teacher to talk to the occupational and physical therapists about Velcro grip pads to add to mallet handles and Dycem plastic sheeting to keep instruments from sliding off wheelchair trays. Reed states that assistive technology items qualify under Special Education funding and music teachers may be able to access this funding for needs in the music room. The session ends with a glance at the session notes resource list, which includes text by Mary Adamek and A. Darrow (from 2005) and online resources.

OTHER AOSA AV LIBRARY RESOURCES ON THIS TOPIC:

115MA Mary Adamek *"Essential Elements of Successful Inclusion: Normalization, Partial Participation and Interdependence"* (2001)

148CC Cindy Colwell *"Orff and Music Therapy: Discovering the Collaboration Seed"* (2006)

157DJC Dee Joy Coulter *"Brain Science, Music and the Developing Mind"* Session #1 (2007)

158DJC Dee Joy Coulter *"Stress Resiliency and the Power of Music"* Session #2 (2007)

151HS Martha Glaze-Zook *"Orff in a Head Start Program: Seeds of Discovery and exploration – A Harvest of Imagination and Improvisation"* (2006)

126DC Lorinda Jones *"Dulcimers in the Classroom: A Music Therapy Approach to Successful Inclusion"* (2003)

117KM Karen Medley *"Music Gets a Twinkle in my Eyes and a Jump in my Feets … Process Lessons and Reflections on Sharing Music with Urban Children"* (2001) ■

***Beth Iafigliola**, a member of the Greater Cleveland Chapter of AOSA, teaches music in the North Royalton School District. She has been promoting the AOSA AV Library since 1995.*

AOSA AV LIBRARY VIDEO PREVIEW

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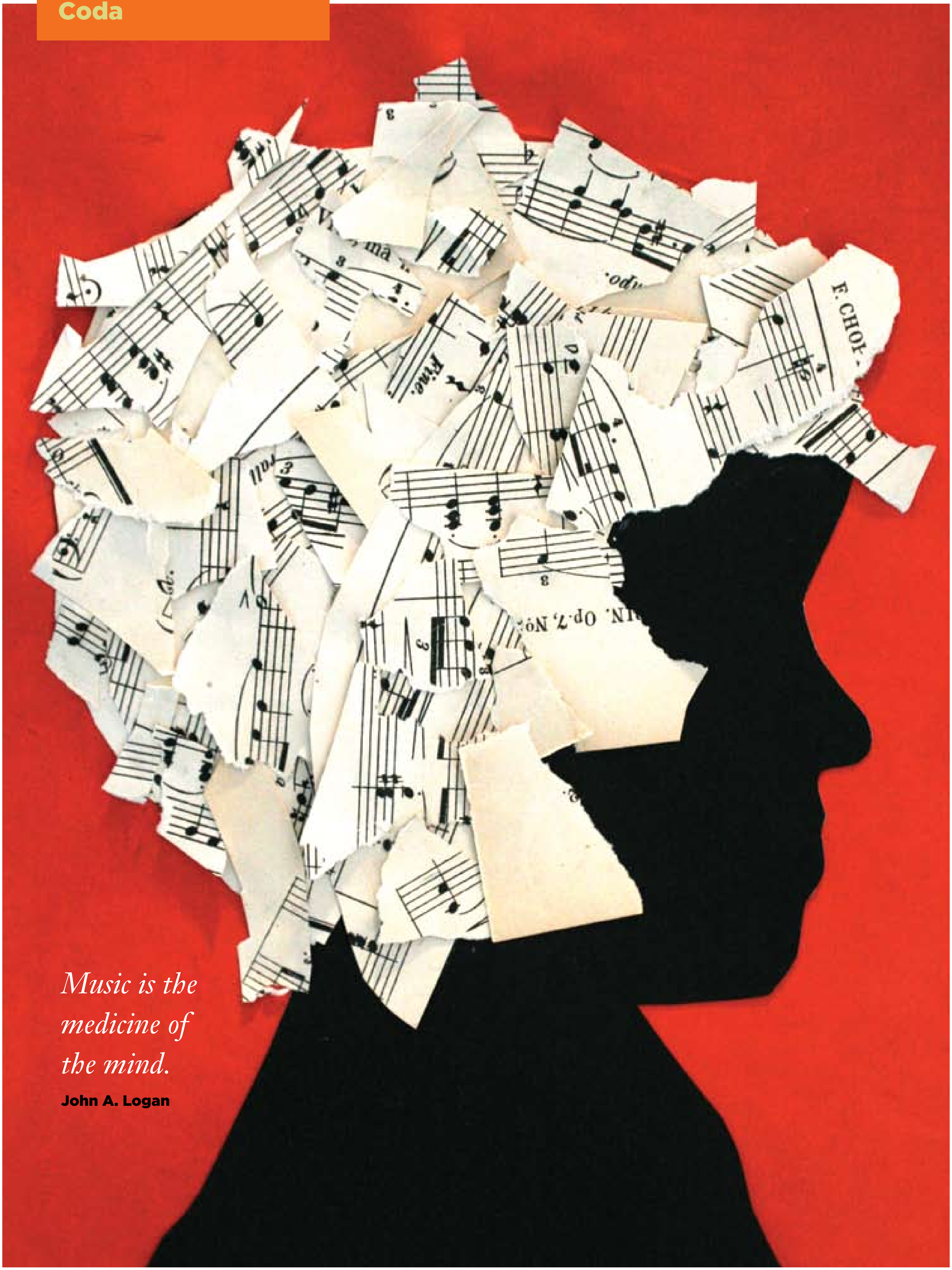
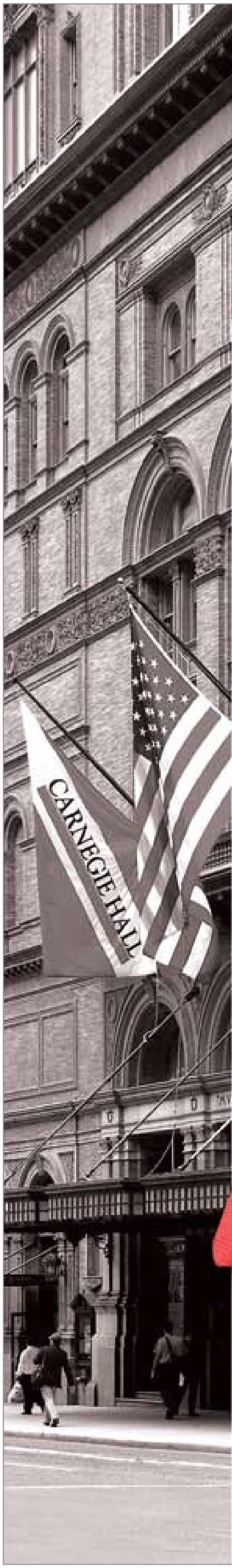


Music is the medicine of the mind.

John A. Logan

CREDIT: EVAN MITCHELL, FIFTH GRADE STUDENT AT AT RICHARDS SCHOOL IN WHITEFISH BAY, WISCONSIN.



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