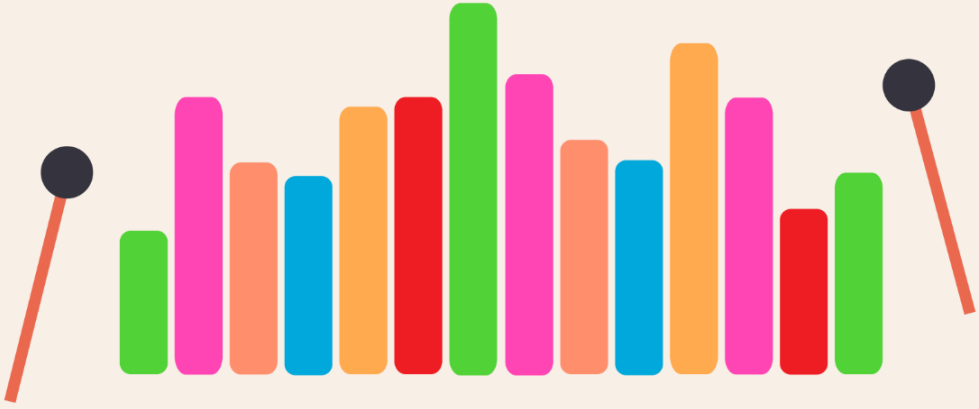
THE MUSICAL CHILD



USING THE POWER OF MUSIC TO RAISE CHILDREN WHO ARE HAPPY, HEALTHY, AND WHOLE

JOAN KOENIG

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Author's Note

The names of the children, parents, and teachers have been changed, with the exception of those who requested their first names appear in the book.

INTRODUCTION

THERE ARE FEW UNIVERSALS IN THIS WORLD, but among them are our love for our children and our love of music. When we cradle baby in our arms, soothing her with song, we are channelling the emotional power of music. We do so instinctively, just as our ancestors did. Music can be a powerful parental ally during the challenging child-rearing years. All parents and educators can access this natural source of pleasure, comfort, and stimulation, because we are a musical species.

To successfully prepare our children for life in the twenty-first century, we will need to nurture qualities such as curiosity, imagination, intuition, empathy, creative entrepreneurship, and most of all resilience. Musical practice in early childhood develops all of the above and more. Research has shown that musical practice in early childhood is beneficial not only for mental acuity but for social and emotional development as well. Music is not just a hobby, a pleasant pastime; it is an integral part of what makes us happy, healthy, and whole. Indeed, if we want to do one thing to help our children develop into emotionally, socially, intellectually, and creatively competent human beings, we should start the musical conversation — the earlier the better.

Children need music in their lives, but not for putative cognitive

gains. Children need to make music together because this is how they learn to become a "we," with the challenges *and* the deep satisfaction this involves. Today, more than ever, children need to experience the exhilaration of a collective effort. Music acts as a magnet for this — it always has.

Humans were making music together long before the first note was written on the first staff, but the practice has largely disappeared from our daily lives. Music has never been so readily available on so many platforms, and yet we are several generations into the false belief that musicking — my preferred term for musical practice — requires arduous training.* In highly developed societies where music is instantly available on multiple devices, I see less and less spontaneous musicking in homes. Rather than singing and dancing with them, we send our children to music class. This is as developmentally absurd as not speaking with your child and sending her to weekly language lessons in her native tongue.

There is an easy and natural way to include the wonders of music in children's lives. I know, because I have spent most of my life doing it.

My own musical journey began in the basement of my family home. My parents were not musical; we did not have season tickets to the Philharmonic, nor did my parents play records on the stereo. Although my mother had no formal musical training, she believed strongly in the virtues of music. One of her certitudes was that every home should have a piano, so when I was four years old, a piano took up residence in our family room. I remember sitting down to "play," touching the keys and experimenting with the sounds they made. I found monsters in the bass notes and fairies fluttering in

* The gerund "musicking" comes from the German noun *Musik*. A gerund is a verb form that also functions as a noun; in English, the added *-ing* ending magically transforms otherwise static words like *cook, play,* and *music* into action. The musicologist Christopher Small (1927–2011) proposed that the word "musicking" enter the English dictionary and include all aspects of music making, including dance.

the highest notes. These musical experiments were a continual source of pleasure and learning. My piano was my favorite toy—and my creative accomplice.

As with many American homes of that era, the radio was very much a part of our lives. One of my father's favorite radio hits was "Que Sera, Sera," sung by Doris Day. I remember thinking that perhaps my piano could produce this song, though I wasn't sure how. Like most children who have access to a keyboard, I began experimenting. Finding the first notes was easy, but then I got stuck where the notes became nonconsecutive. I spent hours negotiating these jumps until I finally figured it out. There it was, "Que Sera, Sera." It felt as though I had broken the code. If I could find the beginning of this song through trial and error, I could find the entire song, and then I could find any song. Finding melodies like this invariably leads to more playing around—or what I like to call musical scribbling—and this leads to improvisation. Today, science confirms the positive impact that creative experimentation has on young minds. It is a door that can easily open in early childhood and remain open for life. Although I am a classical musician, many of my most thrilling performing experiences have involved improvisation. I know that my ability to improvise stems from these first experiments in early childhood.

My childhood and adolescence were filled with music. I began formal piano lessons at the age of five, and when I was nine years old, I asked if I could take up the flute as well, because I wanted to play in a band or an orchestra. Music programs with instrumental training were still part of the public school curriculum in those prehistoric times. A few years and many hours of practicing later, I auditioned for a local youth orchestra made up of young musicians from the greater Seattle area. Members of the orchestra were encouraged to attend a high-level summer camp offering chamber music and orchestral training. It may have been this first musical summer camp that sealed the deal. I loved playing in an orchestra, and I loved living and breathing music. I began seriously practicing the flute after that summer. I subsequently obtained scholarships to

the Interlochen Arts Camp and the Aspen Music Festival. I entered competitions and won awards, performance opportunities, and, finally, entrance to the Juilliard School in 1977.

In 1981, upon graduation from Juilliard, I moved to Paris. Just as aspiring chefs come to France for the culinary traditions, flutists come for the incomparable French school of flute playing. I loved Paris, and I loved learning a second language. Little did I know that I would never leave. Instead, I embarked on a performing career, got married, had children, created a music school, and then a musical preschool.

L'École Koenig opened its doors in 1986 and grew steadily both in size and in scope. Twenty-two years later, in 2008, I decided to take my program a step further. I had witnessed young children's extraordinary musical ability in weekly music classes; I needed to see what would happen if children lived and learned in music every day. So with the help of my courageous staff, we opened a trilingual preschool where the children speak French, English — and music.

At our musical preschool, children are encouraged to improvise songs and stories, which they do readily because music is one of the languages that they are learning. Music is an integral part of all learning in our classrooms; even reading and writing are taught with music and movement. And although the preschool program at L'École Koenig is still relatively young, we are obtaining extraordinary results.

Music can accelerate learning and helps imprint knowledge and experience into lifelong memory. We see children learning their letter sounds instantly by singing and dancing their phonetic alphabet song. Multiplication tables are memorized in a single morning when the children rap and groove with them. More importantly, we observe children of more than twenty different nationalities joyfully singing and dancing together: learning and communicating through their one common language, music.

Not long after opening the musical preschool at L'École Koenig, I also began immersing myself in the world of science — particularly neuroscience. What I found was thrilling and transformative. An exciting, and growing, body of research is illuminating the sci-

ence behind the effects our staff and I were seeing in our young students — underscoring the extraordinary benefits of musical practice in early childhood.

In 2014 I was invited to be a fellow at the Salzburg Global Seminar, and an entirely new chapter in my life began. Salzburg Global organizes conferences on matters of global importance — bringing together people from all over the world to reflect, learn from one another, and bring about change. This conference was titled "The Neuroscience of Art," and of the forty participants, half were artists and half were scientists. I like to say that at that time, I didn't know my hippocampus from my amygdala. But the resulting collaborations with neuroscientists from all over the world have allowed me to corroborate, deepen, and strengthen my understanding of the human mind and the vital place that music occupies in our human construction. I had the empirical evidence before; now I understood the supporting science as well.

Today we have more than thirty years of research into the musical practice and the brain, showing clearly that music helps us develop vital physical coordination, fine-tunes our speech and auditory systems, and reinforces memory. Most importantly, musical practice lifts us out of ourselves into an intuitive, cooperative, and deeply satisfying relationship with others.

One of the most beautiful illustrations of these qualities in vivo is the orchestra. The orchestra can serve as a model for collective creation, even when it doesn't involve musical instruments. Many of our hard-earned societal victories are in danger today, and trust in government is low the world over. We need an inspiring model like the orchestra more than ever because the systems that we rely upon are crumbling. The orchestral model is not about accumulating individual capital gains or securing power; the orchestra's raison d'être is the creation of beauty by combining our strengths and talent.

Meaningful life in the twenty-first century will involve working in groups to find creative solutions to global challenges — among them climate change and the massive population movements this will inevitably cause. The specter of species extinction calls for cool

and creative minds to study the facts and find sustainable solutions. This will demand innovation and an ability to boldly and creatively identify and connect what might strike others as random dots.

Musical practice builds the foundation for creative thinking, especially when it occurs in early childhood. Making the dots on a musical score come to life with your instrument engages your mind, body, and soul. Improvising is an equally complex process, and they both require countless physical, cognitive, and intuitive connections. Playing with absolute precision with others adds yet another layer of complexity — and pleasure.

Learning and working together as an orchestra can prepare us for many other endeavors. Life-changing innovations are rarely the work of one person. They involve sharing knowledge, increasingly from the far corners of the planet, arguing, comparing, fearlessly experimenting, and constantly remaining eager, open, and receptive to new ideas.

The orchestra is a vital concept and a model, and one that needn't be intimidating. Orchestral play can take place anywhere, with any subject, and — as you will see — the orchestra can be made up of very small people, not just classically trained adults. There is no need to wait for children to have the motor skills to play the violin before offering them an orchestral experience.

Most musical programs neglect the opportunity for pre-instrumental musical practice, which means we are missing the ideal moment to develop aural expertise. Musicking at an early age is not simply about developing one's natural musical ability; it is also about learning to coexist with other people at an age at which "me" generally prevails. Before even learning an instrument, our children can learn to work together as an orchestra does: listening carefully, making adjustments, working toward something much bigger than the sum of its parts.

This book will explain the profound effect music can have on children's developing minds and bodies, the more than thirty years of scientific research on this subject that has not yet trickled down into our homes and schools. My goal is to share this research with you alongside stories and examples of real children and their mu-

sical journeys. I also will guide you through music and movement games that you can enjoy with the child in your own life, beginning in infancy. None of these games require previous musical training; indeed, after one or two of them, you will see how easy it is to tap into your own natural musicality, even if you are convinced that you have none.

Since this is a book about music, you are probably going to want to hear the music described in these pages. This book is designed for you to be able to hear the music of each proposed activity instantly, via QR (Quick Response) codes. Each chapter has a QR code that you can scan with your phone.

There are multiple apps available for QR code scanning on smartphones, and many are free of charge. When you scan the QR image, you will be automatically directed to the website www.joankoenig.com where all the original music is available. You can of course just go directly to the website. If you are a musician, simple scores to the music mentioned are in the appendix.

Enjoy!

At its heart, the goal of this book is simple: to help you and your child embark on a fun-filled creative musical journey together and reap the benefits throughout both your lifetimes. In the process, you will be preparing yourselves to take your places in the Orchestra of Humankind.

THE MUSICAL CHILD

1 YEAR ONE

The First Duet

SCAN ME

IT'S A CRISP OCTOBER MORNING IN PARIS, AND AT L'École Koenig, excitement is in the air: the fourth Baby Musicking class of the school year is about to begin. Parents and teachers alike are eagerly anticipating another chance to experience the immediate and joyful reactions of these tiny infants, who range in age from three to twelve months.

Our school has three separate locations, all within a five-hundred-meter area of Paris's 15th arrondissement. The Baby Musicking room, which is located next door to our main conservatory and kindergarten campus, is a brightly colored living room–sized space, with thick blue carpeting for comfortable rolling around — for both the babies and the adults. There is one piano for our pianist, and one piano stripped of its decorative outer shell: a sort of naked version of the instrument, which we denuded by unhooking the

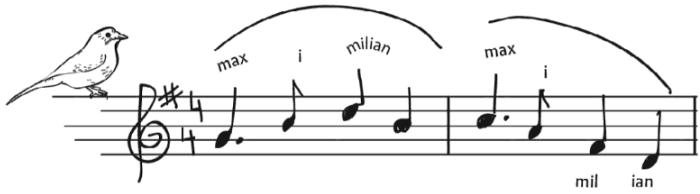
wooden cover above the keyboard that hid the piano hammers, and by removing the cover below the keyboard that hid the lowest and longest strings. This left the keys, strings, and hammers exposed for children to explore, which they do tirelessly. A big conga drum is lying on the floor for baby exploration, along with a small harp and several xylophones.

It takes a few minutes for everyone to exchange greetings, remove their shoes and coats. Soon, parents and caretakers are seated on the floor in a "magic circle," grinning and waiting for the music to begin. After only a few classes, we also sense the babies' eager anticipation; seated on the adults' laps, they become silent and still, clearly waiting. As soon as their teacher Marion counts down from five, and the music begins, the babies start waving their arms, swaying back and forth and vocalizing, which is to say, loudly and happily squawking.

After the "Bonjour/Good Morning" song, Marion launches into a game of rhythmic call-and-response that includes clapping and stomping. The youngest babies try their best to respond: we see them rocking, but their little hands and feet are not yet cooperating.

Next we begin our unique method of calling roll. Each baby has a musical name — a short fragment of music composed to reflect the child's personality and to match the number of syllables in their name. The parents and caretakers join in, greeting each child by singing their musical name, enthusiastically moving in time with the music. An air of unity and joy fills the room.

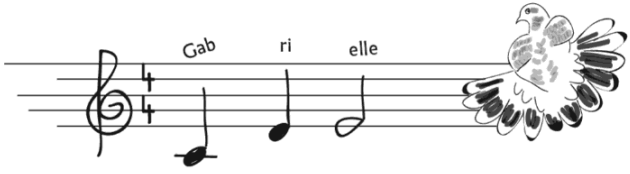
When eight-month-old Maximilian hears his musical name, a fragment of a salsa rhythm, he is initially silent and motionless, as if making sure that this is indeed *his* music. And then he's off, swaying with delight, waving his arms and loudly vocalizing. We sing his name several times as he revels in the group's attention.



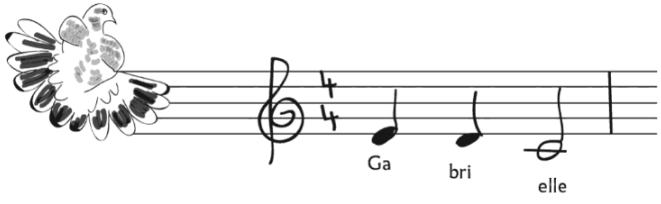
Baby's Musical Name

Would you like to make a melody out of your baby's name? I suggest that you try the following exercise. You might just be thrilled by the results.

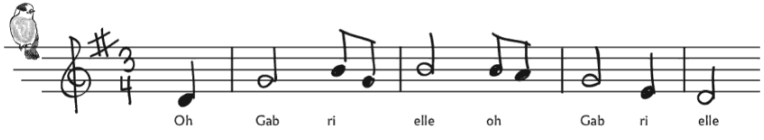
Take the number of syllables in baby's name and make a melody. Let's take the name Gabrielle. You can sing the three syllables moving up, just like Do-Re-Mi,



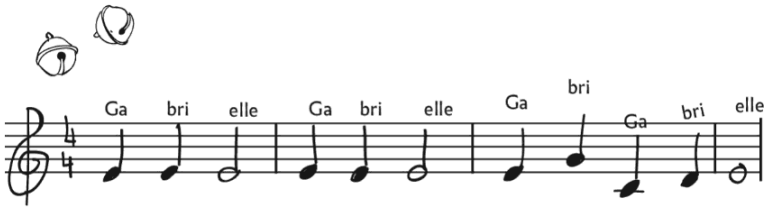
or descending, Mi-Re-Do.



You don't have to start on a specific pitch; just start somewhere that feels comfortable for your voice. No need to feel self-conscious about this. Think of your favorite folk, rock, or R&B songs: the singers don't just sing the notes, they inhabit them. You can also use the beginning of a song you know and just repeat her name to fit the melody. For example, "Amazing Grace" becomes:



Or "Jingle Bells," with its easy-to-retain short-short-long rhythm, is an easy fit for three-syllable names:



Take your baby in your arms and lift or bend according to the rising or falling melodic movement of your song. Now play around: speed up, slow down; use a high voice or a deep, throaty voice. If you have chosen "Jingle Bells," dance to the rhythm with corresponding movements: short-short-long, short-short-long.

Pay attention to which aspects your baby likes best — and stick with what works.

Within a few weeks, you will notice that this song — your baby's very own musical name — will bring on a smile, and also calm your baby when she is distressed. Why? Because this is *her* song. This is a little tiny masterpiece that you have created for her. She recognizes your loving intention, as well as the shape of the melody and the feel of the rhythm. The song is your personal duet: an act of love and connection that she will participate in long before she can actually sing along or move with you.

One morning, not much later in the school year, Max's mother placed the tambourine she had been using on the floor near Max's foot. As our pianist improvised an especially rock-and-roll piece of music, Max inadvertently hit the tambourine with his foot. Seeming both surprised and pleased to have made the sound, he did what every baby does when experiencing something new: he tried it again.

Then he grabbed the tambourine with both hands and began shaking it back and forth. When I moved closer to him with my drum and began to play along with him, Max grew still.

He was staring intently at me, and I could almost see the cogs turning in his little head. He tested me several times, shaking the tambourine once, twice, three times. I would answer with the same number of beats on my drum. Our pianist was following along closely, playing in time with both of us, adding a harmonic layer of resonant chords. Suddenly this spontaneous little exchange was beginning to sound like something more.

We can scarcely imagine what this might feel like to an eight-month-old child, to hear his tentative tambourine-tapping morph into a symphonic work that he appears to be conducting. Max had stopped smiling and now was concentrating his gaze on me, barely moving. Then he began vocalizing, oohing and aahing excitedly. I answered his vocalizations, but he was taking the lead, the conductor directing our nonverbal conversation.

Finally, Max put the small tambourine in his mouth, which was such classic eight-month-old behavior that everyone in the classroom had to laugh. Max signaled that our conversation was over by dropping the tambourine and reaching up to his mother, who proudly smothered him with kisses as the room erupted in applause.

The following week, as we sat down for class again, it was evident that Max not only remembered the game but also wanted to relive the experience. He smiled at me and began tapping his tambourine and vocalizing as soon as his mother settled onto the carpet with him. Once again, this time with certainty, Maximilian was showing us that he was ready to engage in what I call "the first duet."

LOOK WHO'S TALKING . . .

The musical child's journey begins in the first year of life. So much is happening in baby's brain and body during this first year, and research has shown that music is a powerful means of communi-

cation at this stage of life. Stimulating a child's innate musicality sets the stage for healthy cognitive, emotional, and physical development, and above all, self-confidence.

To be sure, there have been far too many claims made about music making your child smarter. Even if this could be proven, moreover, it isn't the primary reason to expose the youngest children to music. Your baby needs a music-infused exchange — the first duet — to reassure herself that she is not alone and, therefore, not in danger. Every sound, every gesture that elicits a response from you confirms in her mind that she exists, that she is safe, and that you are there for her. Even the most basic musical exchanges develop baby's sense of security — the cornerstone of self-confidence, which in turn sets the stage for learning and happiness.

Your baby's brain development mirrors the way the human brain evolved over the millennia — from the bottom up. At the base of the brain, sitting on top of the spinal cord, is a set of structures known collectively as the limbic system, home to our emotional, sensory, and memory centers. Inside the limbic system is the amygdala, one of the key centers for emotional processing Next to the amygdala is the hippocampus, one of our memory processing centers. These two have a veritable communication hotline in place. Both the hippocampus and the amygdala play a crucial role in processing emotional aspects of memories. Music processing strongly engages this highly emotional and reactive part of the brain.

At the front of the brain sits the prefrontal cortex, the seat of analysis, judgment, and executive function, the set of cognitive processes, from short-term memory to the sorting of information, that underlie self-awareness, emotional regulation, planning, and problem solving. The only difficulty for baby, and for you, is that this part of the brain is not even close to fully developed at birth. As an adult, you can manage fear or sadness or confusion with reason and through the benefit of experience. This is your executive function stepping in, lending a rational helping hand. Baby simply does not have this equipment; she is raw sensation and emotion. Her prefrontal cortex, where rationality lives, won't develop fully until late adolescence or early adulthood.

Research dating from as far back as 1980 determined that a fetus's sense of hearing is already functioning in the third trimester in utero. Newborns prefer their mother's voice at birth, clearly demonstrating that they recognize this voice from *before* birth. With fully functioning hearing and a ripe and ready limbic system, baby is biologically prepared to experience music from day one. The effect can be powerful, providing the comfort and reassurance that underlie her emotional stability and well-being. Music affects babies intensely because it engages proportionally more parts of their brain at this stage of their development. Every warm moment of connection is processed in the limbic system, and even if these experiences can't be recalled, they become a part of who we are. Think of the firm foundation of well-being that we can provide by singing and engaging with our babies.

Human beings are naturally sensitive and responsive to melody and rhythm. Almost without exception, babies — all humans, in fact — have a spontaneous physical and emotional reaction to music. You probably have a favorite song, and most likely find yourself tapping your toes in time or becoming emotional upon hearing a memorable piece of music from your past. This is clear and simple proof that you are sensitive to music, that you are musical, even if you never think of yourself that way. And that's all you need to engage with your baby in this elemental musical way.

What are your favorite pieces of music? Whatever the answer, now is the time to share them with your baby. I met a new father recently who had a child late in life. Daniel grew up during the musically prolific 1970s. He told me how he had been dutifully putting on special baby music for his daughter, and hating every minute of it. I asked him what music he loved, and he immediately started gushing about the Stones, the Beatles, ABBA, and Dolly Parton. I laughed and told him to throw away the baby albums, put on Dolly, pick up Patsy, and dance! This shared joy is like a superfood for the mind, the body, and the heart — and not just for baby!

You do not need professional training to make music with your child. Even if you think you sing off-key, or believe you have two left feet, your baby wants to sing and dance with you. This first duet

will bring your child happiness and contribute to her healthy development. I will suggest simple techniques, and the science underlying them, so that you can share musical experiences with your child from the moment she's born. The potential pleasures and benefits to both you and your child are boundless.

What can we learn from Maximilian's duet about an eight-month-old infant's need to communicate? When I joined in with Max, we were engaging in a musical conversation. For an eight-month-old baby, a conversation needs no words, but it does require your full attention. In this case, Max was initiating our interaction and taking the lead. This is an example of the moment when a baby realizes that he can provoke a response from another human being through his voice or actions. Max was learning that he could, in a sense, ask me a question and that I would respond.

Max and I were creating a narrative together. There were no words, but there was meaning. This is an important part of the first duet — the essential dialogue that every baby seeks. And it is enhanced by music. In fact, decades of research suggest that babies prefer music to speech.

Your First Duet

You may doubt your musical ability, but you cannot doubt your ability to speak. The first duet does not have to include musical instruments. All you need are your voice, your imagination, and your body. This simple exercise will get you started.

Sit down and place your baby face-up on your thighs, with her head on your knees, her feet touching your stomach. You can sing or whisper just about anything — even made-up nonsense words — as long as you are not afraid to modulate your voice. Take her feet or hands (or, ideally, one of each) and gently move them in sync to your words or your song. We know that babies prefer song to speech, so this is the moment to let go of any fear of singing. Keep constant eye contact with your

baby. Pretend you are a mime, and use every facial expression you can. Don't be afraid to be silly; open your mouth and stick out your tongue. Your baby will probably do the same!

You look so lovely in your beautiful blue pajamas!
Daddy loves his baby ohhhhhhh so much!
Let's make some pancakes, pancakes, pancakes . . .

Remember that repetition is necessary for baby because it develops her ability to predict what will come next — and when it does, she is happily reassured. This is one of the principal ways that babies learn. Listen very closely to your baby's tiny sounds and try to answer with something that keeps the conversation going. Repeat the sounds that baby makes, and perhaps add on, much like you might in an adult conversation: "Oh, really? I had no idea!"

Be sure to also pay attention to your baby's facial expressions and movements. You can imitate them, and then try

adding something new, like a raised eyebrow. Try moving your mouth in a funny way and accompanying the movement with a "pop" sound. Your baby will surely begin to imitate these facial expressions, which is a crucial part of her development. (Imitation is one of the first steps on baby's path to absorbing the codes of her culture. The youngest baby imitation on record was a newborn: she stuck out her little tongue in imitation forty-two minutes after birth.) Most importantly, if your baby smiles or gurgles, repeat whatever you are doing; she is telling you that she likes this and wants to hear it again.

As your baby grows, these conversations often become like comedy routines. You might ask a question during mealtime, only to have your child answer with a litany that sounds like a song in a foreign language. Observing the birth of language in a baby is extraordinary; no wonder scientists have been trying to understand the musicality of this uniquely human ability for decades.

When Max and I took turns banging on our drums and "oohing" and "aahing," we were having what linguists call a "proto-conversation." A proto-conversation consists of sounds, gestures, and meaning before the onset of language in a child. The musical conversation I shared with Max is a vibrant example of this duet. I am a professional musician, but when I had my first child, my classical music training was the furthest thing from my mind. Singing with my baby was instinctive. My own mother sang a great deal in my early childhood. She had no musical training, but if she had any insecurity about her musicality, she never let it get in the way. We are a musical species; musicking takes place all over the world, in most cases without professional training.

The first duet is a prelude to language and well-being, but how does this work exactly? The research on infant language acquisition and musicality began more than sixty years ago, long before neuroscience, fMRI (functional magnetic resonance imaging) scan-

ners, and our modern fascination with the mind-body connection. We are going to look at the extraordinary findings of a group of researchers at Harvard in the 1960s — findings that redefined our understanding of the critical developments during the first years of life. Babies are listening and learning even before they are born. They are learning to speak long before they delight us with their first words, and the key to all of this learning lies in human interaction, or the first duet.

THE BABY WHISPERERS

In 1967 the psychologists Jerome Bruner and George A. Miller set up the Harvard Center for Cognitive Studies. Psychological research was stagnating in 1956 when Miller, a professor at Harvard, delivered a paper titled "The Magical Number Seven, Plus or Minus Two." The paper set off an explosion of research into how memory works. Miller was the quintessential "out of the box" thinker. To create the protocol for his evaluation of short-term memory, he borrowed a model from the virtually unknown field of computer coding — in 1956! Miller revolutionized the world of psychology by demonstrating that although the mind is invisible, it can be tested.

Jerome Bruner was also a brilliant iconoclast who was constantly reinventing himself. During his seventy-year academic career he constantly moved from one field to another, bringing new and notable contributions in areas as diverse as music, education, physics, literature, and the law. In his own words, the basis of his work was the study of cognition, or what he called "the great question of how you know anything." Bruner and Miller are considered the instigators of what would become known as the cognitive revolution. Their team included some of the finest minds in the field at the time: Colwyn Trevarthen, T. Berry Brazelton, Edward Tronick, and Noam Chomsky.

Bruner wanted to investigate nothing less than the foundations of language — infant modes of communication beginning at birth.

His team began to film and study interactions between preverbal babies and their mothers. One of the team members, Colwyn Trevarthen, was using a filming technique that could film at sixty-four frames per second, almost three times the standard twenty-four fps. This new technique would provide high-quality slow-motion footage that allowed the team to detect and study the baby's slightest gestures and vocalizations.

Trevarthen's filming technique uncovered something incredible. Not only did the researchers find that babies were cognizant of their caretakers and interacting with them, but also they observed that babies were often taking the lead — *initiating* the proto-conversation.

The prevailing language theory at the time was the work of Noam Chomsky, who believed that children have an innate ability to learn language because they are born with a *language acquisition device* (LAD). Bruner disagreed and cheekily coined a term for his own theory: *language acquisition support system* (LASS). He concluded that children learn to speak not from innate hardwiring but rather through human interaction. Colwyn Trevarthen was in agreement, and further qualified infant language acquisition as a "turn-taking structure of conversation that develops through games and nonverbal communication long before the onset of actual words." The entire brilliant team agreed on the fact that babies seek communication, beginning at birth, and that this need must be met for healthy development.

Bruner did not just coin the memorable term for his new theory of language learning; he also was the first to give a name to the specific way adults speak to babies. He called it *child-directed speech.*

MOTHERESE

There is a specific form of child-directed speech that parents use with their children in all cultures and languages, usually referred to as Motherese or Parentese. The musical, vocal, and imitation el-

ements that constitute Motherese are all part of the first duet. They are inherently musical, and breathe life into the child's emotional, cognitive, and physical development.

We are all fluent in Motherese; certain unconscious behaviors appear to surface when we are in the company of an infant. We address the baby in a lilting musical manner, typically without even thinking about it. It might sound something like "Oohh my sweeeeet beauuuuuuutiful baaaaaby!" And what does baby do? She engages immediately, emotionally, vocally, and physically. Not only does she engage, but also she will prompt you if you are not keeping up your end of the conversation.

The term "Motherese" first appeared in a 1975 doctoral dissertation by Elissa Newport, a student at the University of Pennsylvania. The author was studying the speech women used with their daughters, but she also acknowledged the role of fathers and caretakers in infant language acquisition. In an article in the *New York Times Magazine* in 1994 (written under the pseudonym "Motherese"), she defended her choice of this gender-specific term. "Newer terms take into account that fathers and others influence the child's language," she wrote. "I've heard 'caretaker talk' and 'child-directed speech,' but no single word is as effective as Motherese."

There may be an evolutionary reason why adult humans speak to their infants in the particular way that Newport, and Bruner before her, described. Motherese allows mothers to attend to their very dependent infants in a manner that is emotionally satisfying and therefore pleasurable for both parties. This can actually be considered, in the Darwinian sense, necessary for the survival of the species, given that a newborn's survival is dependent entirely on her parents or caretakers, and that helpless babies are going to need a great deal of attention for a very long time. One researcher thinks that this win-win emotional duet is actually necessary for the survival of both child *and* parent.

How did Motherese develop? Why are human babies so very helpless when compared to other mammals? About 6 million years ago, when our ancestors began the slow process of moving from all

fours to an upright position, the body had to evolve. Some of the most significant changes involved the female body and concerned gestation and childbirth. The birth canal was becoming shorter and smaller at the same time that the human brain was becoming larger. Very gradually, over millennia, the gestation period decreased, resulting in a smaller, less mature baby — with a smaller head. The result of all of these extraordinary evolutionary events is that at birth, human babies are the most helpless newborn mammals on earth. To achieve the level of independence of a newborn chimpanzee, our babies would need a gestation period of twenty-one months and would weigh roughly twenty-five pounds at birth.

Therefore, from about 1.6 million years ago, the human baby was born essentially premature in terms of neurological development, and unable to survive on its own. These helpless babies required 24/7 care, yet their mothers also needed to take care of hearth and home. Among the difficulties faced by these early working mothers was that their babies, unlike other mammals, were not born with the ability to hold on to their mother's neck or waist while she worked. They could not even sit up on their own for the first six months or so. When a mother needed to prepare a meal, she had to set the baby down, and her attention would be divided between her chore and her baby. She could, however, sing and coo, thus engaging her baby with sound, and keeping the baby "with" her via their vocal exchange.

The universality of Motherese across cultures lends credibility to this theory. The fact that an infant's hearing is almost fully developed at birth means that even if she does not see her mother, she will hear her and respond, even at a distance, thus freeing her mother to carry on with other chores. The musical dialogue maintains the constant communication necessary to guarantee that baby is safe while allowing mom the freedom to take care of dinner, which, of course, contributes to everyone's survival. Motherese has become part of our instinctive behavior, one of our *sapiens*-specific practices.