

## Expressive piano technic: basics of healthy movement, technic and interpretation

Scott McBride Smith\*

\*Corresponding Author, Scott McBride Smith, Affiliation Cordelia Brown Murphy Professor of Piano Pedagogy, University of Kansas, US, e-Mail smcbsmith@ku.edu, <https://orcid.org/0000-0002-7077-7646>

DOI 10.12975/rastmd.2021923 Submitted August 12, 2021 Accepted Sept 25, 2021

### Abstract

In the 19th century, leading piano pedagogues stressed the importance of accuracy and speed in piano playing. “Nothing is worse than wrong notes,” wrote Czerny, only to be chastised by Beethoven asking for more musical teaching. 20th and 21st-century research has shown that this technic-interpretation divide is a false dichotomy: even early-level students are able to discern emotional expression and musical form while simultaneously building their piano technic. A knowledge-based approach to piano teaching will incorporate insights derived from current research into aural perception and motor learning. These include audiation: the ability to sing inwardly, think in sound and understand every detail of music making without the physical presence of sound. Building a student’s sense of interoception, the awareness of sensations inside the body; and proprioception, the consciousness of limb position and movement outside the body, will facilitate technical development. Helping a student integrate all of this into their executive control, the ability to switch rapidly from task to task and quickly focus attention in different parameters, has been proven to improve brain function. “Technic comes from the mind (Geist), not the fingers,” said Liszt. In light of the growing interest in neurologically informed teaching, current research is summarized and cited, and practical, step-by-step applications are provided for immediate use in the teaching studio, demonstrating a new integrated schema for building a strong technical foundation in all piano students.

### Keywords

*audiation, delayed continuity practice, executive control, interoception, kinesthetic learners, proprioception, visual learners*

Defining the basic elements of piano technic helps make our learning faster and our performances more expressive and reliable. Fewer hours of work, too!

What makes a good piano technic? Viewed in the simplest way, it’s the ability to:

- Project differing degrees of loudness and tone quality for single notes and those within a chord
- Perform accurately and expressively at any tempo

- Play and release notes, one at a time or simultaneously with other notes, at a desired point in time

Technic fundamentals are, not surprisingly, focused on the mechanics of playing. Every pianist has to spend significant time working on these. But too much focus on pure mechanics can result in an interpretation that

is dry, even sterile. So the key word is “expressively.” Technic must be linked to musical expression. “You have to be motivated toward communication,” the legendary Juilliard teacher Adele Marcus once told me during a lesson. “If not, why bother with everything else?” But her views are not universal.

Many teachers describe piano technic as the ability to play scale and arpeggio passages with clarity at great speed. Performance of repertoire is often viewed through a similar lens: accuracy and evenness are valued above originality and communication. This narrow definition of technic is not new; it has persisted since the first half of the nineteenth century. Learning then was often based on what some historians call a “mechanistic model.”<sup>1</sup> Many piano-teaching authorities believed that students first needed to painstakingly assemble fundamental skills (a useful idea if not taken to extremes); creative thinking was not permitted until the basics were learned, but deemphasized even then. Some recommended practicing drills for a full year before commencing music study. Even after the student began work on repertoire, authors advised that a full 75% of total practice time should be devoted to pure technic. Do your arms hurt? Keep going! More than one expert advocated continuing to practice past the pain threshold. Accuracy and control were everything. “In music, nothing is worse than playing wrong notes,” wrote Czerny.<sup>2</sup>

Beethoven disagreed. He wrote to Czerny, who was the teacher of Beethoven’s nephew Karl, asking him to focus more on interpretation. “Don’t stop him because of trifling mistakes but point them out after he has finished the piece...I have always followed this method, it soon makes musicians which, at least, is one of the first purposes of art...”<sup>3</sup> Similar dialogues took place between Mendelssohn and Moscheles, Clara Schumann and Brahms. They asked each other: is mechanical control the only important aspect of piano technic? Can elementary-level students think musically?

Contemporary research provides a simple answer: yes.<sup>4</sup> Young students intuitively understand musical motives and phrases. They can readily discern simple structural function and feelings of closure. Students don’t have to wait to develop a perfect technic in order to enjoy music making. Our 21st-century definition of piano technic must encompass interpretation, not delay it.

Piano technic is the ability to express in motion any and every musical idea—including, but not limited to, fast even scale playing. Technic should be linked to interpretation in each moment of practice. A good practice session is a chance to explore the interpretive content of your repertoire more deeply as well as building motor control. What about the technic of pedaling? Of creating beautiful tone? Of playing softly with projection? Each requires its own inventive technic.

1 Lia Lior, “In Music Nothing is Worse than Playing with Wrong Notes,” *Journal of Historical Research in Music Education* 38 no.1 (October, 2016): 5-24.

2 Carl Czerny, *Letters to a Young Lady on the Arts of Playing the Pianoforte*, trans. by J.A. Hamilton, (New York: Hewitt & Jacques, 1837-1841, reprint Da Capo Press, 1982), 5.

3 Alexander Thayer, *Life of Beethoven*, rev. and ed. by Elliott Forbes (Princeton University Press, 1991), 679.

4 Jeanne Bamberger, “Learning from the Children We Teach,” *Bulletin of the Council for Research in Music Education* 142 (Fall, 1999): 48-74.

## Application—Making Scales and Arpeggios Expressive

Identify a piece you have performed that features, at least in part, scale or arpeggio playing. Describe three possible ways to play the scales and arpeggios musically and creatively.

Questions to consider:

- What is the mood of the section featuring scales?
- What role do the scales play in your interpretation?
  - Melodic
  - Accompanimental
  - Virtuoso
- Other features to think about
  - Articulation
  - Dynamics
  - Accents

## Preconditions of a Good Technic

### Audiation

Reading music is treated by most teachers as fundamental to learning to play the piano in the 21st century, sometimes to the detriment of other musical skills. This was not always the norm. In the 18th and 19th centuries, pianists were expected to be able to improvise. Clementi and Mozart both improvised at their famous contest before Austrian Emperor Joseph II in 1781.<sup>5</sup> Hummel, Czerny and Kalkbrenner, among other legendary pianists of the day, wrote piano methods providing guidance on improvising preludes.<sup>6</sup> Everyone did it, perhaps not always with success: a Mr. Kellner of

London prefaced his own composition in D major with an “inappropriate introduction” in D-flat major, according to one contemporary source.<sup>7</sup>

The ability to think in sound, rather than responding solely to marks on a printed page, is key to improvising well. It is also a prerequisite to good technic and interpretation, perhaps the most important one. The legendary 19th-century piano teacher Theodor Leschetizky (1830-1915) would work on all the interpretive details of a performance—phrasing, tempo, balance, pedaling—on long walks, telling his assistant Ethel Newcomb “listening to the inward singing of a phrase was of far more value than playing it a dozen times.”<sup>8</sup> The famous American folk singer Pete Seeger wrote “music teachers sometimes overemphasize the importance of learning to read music early. Would you teach a baby to read before it could talk? Should a teenager study dance notation before learning to dance? Musicians need in the beginning, to train their ears, their vocal chords, or their hands, and to develop the sense of music that tells them when to sing [or play] what.”<sup>9</sup> I tell students: If you can’t hear it or sing it--you can’t play it.

Piano playing should always be prefaced by audiation, a term coined by Dr. Edwin Gordon in 1975. Audiation “takes place when one hears and comprehends music for which the sound is no longer or may never have been physically present.”<sup>10</sup> For a performer, it’s the ability to shape

5 Katalin Komlós, “Mozart and Clementi: A Piano Competition and Its Interpretation,” *Historical Performance* 2 no.1 (Spring, 1989): 3-9.

6 Valerie Woodring Goertzen, “By Way of Introduction: Preluding in 18th- and Early 19th-Century Pianists,” *The Journal of Musicology* 14 no.2 (Summer, 1996): 300.

7 Goertzen, 299-337.

8 Ethel Newcomb, *Leschetizky As I Knew Him* (New York: Da Cap Press, 1967), 18-19.

9 Pete Seeger, *Henscratches and Flyspecks* (New York, NY: Berkley Medallion Books, 1973), 9.

10 Edwin E. Gordon, *Learning Sequences in Music* (Chicago: G.I.A. Publications, 1980), 3.

sound in your mind before you play; to develop a clear mental picture of what sounds you want to hear in advance instead of responding to—and fixing--the sometimes-haphazard results of unguided fingers. Audiation means thinking in sound instead of with musical notation or pedagogical words. It's the crucial first step to developing an outstanding piano technic.

### **Application—Practice Audiation Using Delayed Continuity**

Frank Merrick (1886-1981) was a Leschetizky student who later taught at the Royal College of Music in London. He capped his distinguished teaching career in 1958 by publishing a book called *Practising the Piano* (London: Barrie & Rockcliff), one of the best sources of practice advice ever written.

In *Practising the Piano* Mr. Merrick devotes a chapter to something he calls “delayed continuity,” a practice device that develops audiation, although he did not use that word.

1. Choose one of the pieces you are currently studying.
2. Mark the beginning and ending of each phrase with a bracket
3. Divide each phrase into motivic units, marked with a caret and a fermata
4. Play the first motivic unit. When you get to the spot that you marked with a caret and fermata, stop and hold that note or rest. While holding that note or rest, sing the melody of the next motivic unit in time.

As you sing, alternate mental focus on different performance skill areas, one at a time. For each skill area, sing out

loud until you are completely satisfied; then repeat, singing silently (audiating).

- Melodic shaping and timing
- Fingering
- Technic
- Pedal
- Memory
- Any other area you think needs work.

But being able to completely realize your musical sound plan through the physicality of piano technic is not so easy. Your ideas in sound have to be expressed through a complex set of physical motions and coordinations at the keyboard. Each small movement has to be balanced and correct; sequenced in patterns with other motions; and be performed properly with no chance of an on-stage do-over. These are part a category of learning broadly called motor skills, abilities related to muscular activity, ranging all the way from what are called fine motor skills in the hands and wrists to the gross motor skills using the larger muscles in our torso, arms and legs. The principles of skilled motor learning apply to all movement: it is “a product of four different elements: force, velocity [speed], accuracy, and purposefulness. In a skillful performance, all four elements must be performed at the same time in exactly the right combination and amount.”<sup>11</sup> Coordinating these four components at the piano takes practice, a lot of it. But organizing your practice appropriately and concentrating on essential tasks in the correct order can speed up the process.

A famous pioneer in piano technic rese-

<sup>11</sup> Michael Kent, *The Oxford Dictionary of Sports Science and Medicine* (Oxford: Oxford University Press, 2006), 356.

arch, Otto Ortmann, wrote “piano playing is movement, not position.”<sup>12</sup> This is especially true in the early stages of piano study. Swimmers, figure skaters, dancers--all learn fundamental movements one at a time in the early stages of study. It should be the same in learning the piano. Once each discrete motion has been mastered to a reasonable degree and can be performed without much conscious thought (scientists call this “automaticity,”<sup>13</sup>) then the movements can be linked in sequence to create musical expression. I borrow a term from the world of dance to describe this series of motions: choreography.

For many years, piano teachers believed that the ability to perform technical choreography was innate, a musical talent that a few people have somehow been gifted, but which most do not possess. Research over the last 30 years has clearly demonstrated that many of these skills can be learned. It’s worth the effort. Students have higher levels of fine motor skills in kindergarten have higher rates of achievement for years afterward<sup>14</sup>, not just in sports and recreational activities but in intellectual

and academic pursuits, too.<sup>15</sup>

### Interoception

The first step to developing your own expressive choreography is to achieve mindfulness about yourself. Some students think: I know myself better than anyone. I know what I like, I know what I don’t like, and I know what I can do. Research does not entirely support this. Starting in 1999 social psychologist David Dunning and colleagues have been studying the reasons people overestimate their own abilities.<sup>16</sup> People often exaggerate their talents and ignore their deficiencies; they don’t receive accurate feedback from themselves and others. The phenomenon is so common and crosses so many fields of endeavor that has a name, the Dunning-Kruger Effect. It’s not limited to North Americans. Other scientists have found evidence of similar trends in Asia and Europe.<sup>17</sup> You will never reach your technical goals without self-awareness, self-regulation and the ability to self-correct.

Interoception is inner consciousness, “the perception of sensations from inside the body and includes the perception of physical sensation related to internal

12 Tao Wu, Piu Chan, and Mark Hallert, “Movement Automaticity Shows Less Activation, but More Connectivity: A Model for Brain Efficiency,” *Physiology News* 73 (Winter, 2009), <https://www.physoc.org/magazine-articles/movement-automaticity-shows-less-activation-but-more-connectivity-a-model-for-brain-efficiency/>, accessed July 30, 2021.

13 Tao Wu, Piu Chan, and Mark Hallert, “Movement Automaticity Shows Less Activation, but More Connectivity: A Model for Brain Efficiency,” *Physiology News* 73 (Winter, 2009), <https://www.physoc.org/magazine-articles/movement-automaticity-shows-less-activation-but-more-connectivity-a-model-for-brain-efficiency/>, accessed July 30, 2021.

14 Meghann Lloyd, Travis J. Saunders, Emily Bremer, et al. “Long-Term Importance of Fundamental Motor Skills: A 20-Year Follow-Up Study,” *Adapted Physical Activity Quarterly* 31 (2014): 67-78.

15 Claire. E. Cameron, Laura L. Brock, William M. Murrah, et al., “Fine Motor Skills and Executive Function Both Contribute to Kindergarten Achievement,” *Child Development* 83 no. 4 (July-August, 2011): 1229.

16 David Dunning and Justin Kruger, “Unskilled and Unaware of it: How Difficulties in Recognition of One’s Own Incompetence Lead to Inflated Self-Assessments,” *Journal of Personality and Social Psychology* 77 no.6 (December, 1999): 1121-1134.

17 Michael Muthkrishna, Joseph Heinrich, Waturu Tokokawa, et al., “Overconfidence is Universal? Elicitation of Genuine Overconfidence (EGO) Procedure Reveals Systematic Differences across Domain, Task Knowledge, and Incentives in Four Populations”, *PLoS One* 13 no.8 (2018), <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0202288>, accessed August 1, 2021.



organ function such as heart beat, respiration, satiety, as well as autonomic nervous activity related to emotions.”<sup>18</sup> Interoception helps you integrate your physical sensations with thinking and feeling. This pertains to the choreography of technic as you practice as well as coping with emotional stress when you perform. Students often lack awareness of internal bodily sensations that need to be brought into consciousness; they may not even know how to perceive them or cannot maintain attention for more than a few moments.

Interoception can be improved in three steps:<sup>19</sup>

- Building the vocabulary of body literacy through improved consciousness of body use and sensation
- Developing somatic (bodily) awareness during practice and performance
- Fostering the capacity to sustain and assess interoception over time

### **Application--Interoception**

Focus on your feet while seated at the piano: foot position is an important part of body alignment necessary for good technic.

- Your toes should be pointing forward
- Your weight should be focused on the inside of each foot

Improve your interoception of foot position and its affect on your body:

<sup>18</sup> Cynthia J. Price and Carole Hooven, “Interoceptive Awareness Skills for Emotion Regulation: Theory and Approach of Mindful Awareness in Body-Oriented Therapy (MABT),” *Frontiers in Psychology* 9 (May 2018), <https://www.frontiersin.org/articles/10.3389/fpsyg.2018.00798/full>, accessed June 19, 2021.

<sup>19</sup> Cynthia J. Price, Elaine A. Thompson, Sheila A. Crowell, et al., “Immediate Effects of Interoceptive Awareness Training through Mindful Awareness in Body-oriented Therapy (MABT) for Women in Substance Use Disorder Treatment,” *Substance Abuse* 40 no.1 (2019): 5.

1. Mindfully experience foot position
  - a. How would you describe the feeling of sitting with your feet in the proper “toes forward-weight on the inside of the foot” position?
  - b. How would you describe the feeling of sitting with your feet placed incorrectly, with toes pointing out and weight on the outside of the foot?
  - c. Walk around briefly using both foot positions and describe the sensation.
2. Choose a section of one of the works you are practicing. Play through it at a medium-slow tempo, without using any of the pedals, focusing continually on your feet.
  - a. Were you able to keep your attention on your feet for the performance of the whole section?
    - i. If not, where were the spots your attention lapsed?
    - ii. Can you identify the reason your attention strayed from your feet?
  - b. Repeat until you can maintain focus on your feet for the whole performance
    - i. Repeat again, adding use of the pedal(s) as appropriate while still focusing on foot position
3. Gradually increase the length of the performance section maintaining focus on your feet.

Expand your focus to other bodily parts and to the emotions you experience while practicing and performing, following the same steps.

### **Proprioception**

Proprioception refers to a person’s sense of motion in space outside of the body:

“of relative position and movement...”<sup>20</sup> It’s your perception of yourself moving in the outside world. Proprioceptive training has been proven to change brain function and even alter the brain’s physical qualities<sup>21</sup> as well as improving motor skills. Thinking about proprioception has been going on at least since the time of Aristotle but there is still much to be learned.

Most proprioceptive functions take place below the level of conscious awareness: they are routine parts of daily life. But the high degree of precision necessary for skilled pianism requires pianists to bring proprioceptive movements into conscious awareness, mindfully adjusting even the smallest position change in light of knowledge, experience and ongoing sensory input. New movements require much deliberation in the early stages of learning; once mastered, too much conscious thought actually inhibits performance.<sup>22</sup>

### Application--Proprioception

A technical difficulty that can seem unsolvable can sometimes be traced back

20 Jessica M. Holst-Wolf, I-Ling Yeh, and Jürgen Konzak, “Development of Proprioceptive Acuity in Typically Developing Children: Normative Data on Forearm Position Sense,” *Frontiers in Neuroscience* 10 (2016), <https://www.frontiersin.org/articles/10.3389/fnhum.2016.00436/full>, accessed July 28, 2021.

21 Assal Habibi, Beatriz Ilari, Katrina Heine, et al., “Changes in Auditory Thickness Following Music Training in Children: Converging Longitudinal and Cross-Sectional Results,” *Brain Structure and Function* 225 (2020): 2463-2474.

22 Kazuhiro Yasuda, Yuki Sato, Naoyuki Iiumra, et al., “Allocation of Attentional Resources Toward a Secondary Cognitive Task Leads to Compromised Ankle Proprioceptive Performance in Healthy Young Adults,” *Rehabilitation Research and Practice* (2014), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3910264/?tool=pmcentrez&report=abstract>, accessed August 5, 2021.

to a problem in your sensory processing. These types of problems are difficulties of perception, not due to lack of talent.

If you think this may be your situation, try these steps:

**1. Simplify** Remove distractions. Make your environment as calm as possible. Begin your work away from the keyboard:

a. Check your spinal organization, rocking your body in a gentle rhythm forwards, backwards and sideways until you feel centered. Feet should be facing forward.

**2. Amplify** Select a technical problem-spot to work on. Analyze the required movement and joint position. Break down each motion to its smallest components.

a. Begin by practicing away from the keyboard, on the fallboard or any flat surface.

i. First practice out of rhythm. Start with slow motions, speeding up as you feel comfortable.  
ii. As you gradually feel calm and organized, start to play it in the correct rhythm, still away from the keyboard.

**3. Apply** Practice the problem spot at the keyboard in rhythm, beginning at a slow tempo and gradually speeding up.

**4. Repeat** Lots of drill enables you to accomplish complex motor tasks with less conscious thought.

### Executive Control

Interoception (your sense of what is going on inside you) and proprioception

(your awareness of your movement and positioning in the world outside your body) are functions of something scientists call executive control. Your sense of executive control helps you make fine adjustments to the effort, force and weight of your external proprioceptive movements and the kinesthetic sensations of interoception. This enables you to focus attention where needed, inside to out, switching your focus from inner sensations to outer movements of the fingers, arms and torso. Can you inhibit distractions and move from task to task quickly and accurately? Musically trained adults and children have been proven to have higher levels in these areas compared to non-musicians, even after only six months of musical study.<sup>23</sup>

Anything that improves brain function improves piano technic. “Technique comes from the mind (Geist), not the fingers” wrote Liszt in the 19th century, well before sophisticated brain research was possible; to Busoni, “the greatest technique has its seat in the brain.”<sup>24</sup> There are two different types of imagery that influence motor learning.

- Visual learners can imagine movements mentally, sensing dimensions of space without necessarily having to move. This can be from their own performer’s perspective, or as if imagining themselves in the third person, as an audience member might see them.

23 Jennifer Zuk, Christopher Benjamin, Arnold Kenyon et al., “Behavioral and Neural Correlates of Executive Functioning in Musicians and Non-Musicians,” *PLOS ONE* 13 no.1 (2014, corrected 2015 and 2018), <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0099868>, accessed July 29, 2021.

24 Kenneth Hamilton, *After the Golden Age: Romantic Pianism and Modern Performance* (Oxford: Oxford University Press, 2008), 160.

- Kinesthetic learners often need to feel the energy of the bodily movement and positioning non-visually.

Students internalize motor learning in their own way. This can influence becoming a skilled technician. Students that score highly in both visual and kinesthetic learning develop technic faster; visualizing oneself as if seen by another person also speeds technical learning.

### **Application—Executive Control**

“Spoon-feeding in the long run teaches us nothing but the shape of the spoon.”

E.M. Forster, “Sayings of the Week,”  
The Observer, October 7, 1951.

Every person is unique. Your goal is to learn from every experience--but to completely develop your sense of executive control, you have to contribute to your own process. Create your own knowledge!

Choose section of a work you have been playing for awhile.

1. Change your practice circumstances.
  - a. If you used to practicing in the evening, practice first thing in the morning instead. Practice on a different piano: even a lesser-quality instrument can help you hear freshly.
2. Mindfully experiment with different interpretive contexts. Focus on the experience, not the words.
  - a. **Auditory** this relegates to the imaginative sound of what you play. Make up stories about the piece and



then deliberately change them

i. Develop a bold interpretation

ii. Play the same section again, playing gently and with subtlety.

b. **Visual** write down a chart of your piece including interpretive points. Diagram how one event leads to another.

c. **Kinesthetic** focus on how you feel when you play, interoceptively and proprioceptively, Adjust your physicality as necessary.

your practice skills are good, you won't have to work so hard. In one study, when highly skilled pianists were assigned a tapping task, they improved their motor skill activation rapidly while non-musicians did not. You might say that pianists who were expert at practice were able to largely skip the slow improvement phase of task-learning, accomplishing in minutes tasks that took others weeks.<sup>26</sup>

## Conclusion

Students who try to develop their piano technic by repeating the hardest piece they can find at top speed will not succeed. A better course is to choose to become excellent at practice, focusing on inner sensation and outer movement guided by thought. Planning the key facets of your sound should precede physical movement "Think ten times, [before] playing once," Leschetizky advised his students.<sup>25</sup> The goal is the projection of imagination and communication through technical mastery.

Remember that piano playing is motion rather than location. The more effectively your executive control manages your interoception and proprioception the more precise your fine and gross motor motions will become. Practice the four elements of motor learning, force, velocity, accuracy and purposefulness, in small chunks with many mindful repetitions.

Does so much focus on motor execution and planning seem too time-consuming? It isn't. These skills will make your practice more effective. Paradoxically, when

<sup>25</sup> Frank Merrick, *Practising the Piano* (London: Barrie and Rockliff, 1958), 1.

<sup>26</sup> Margret Hund-Georgiadis and D. Yves von Cramon, "Motor-Learning Related Changes in Piano Players and Non-Musicians Revealed by Functional Magnetic-Resonance Signals," *Experimental Brain Research* 125 (1999): 417-425.

## Biodata of Authors



**Scott McBride Smith** is a recognized leader in worldwide music education. As the Cordelia Brown Murphy Professor of Piano Pedagogy at the University of Kansas since 2010, he focuses on national issues of teacher training and piano pedagogy. As President and CEO of the International Institute for Young Musicians, he leads a summer program offering specialized training for gifted young performers from around the world. And as co-author of the groundbreaking new series *American Popular Piano*, he has helped create a course of study for today's student - providing tools that inspire the necessary hard work while playing music they love.

Scott McBride Smith is President of the Music Teachers National Association of the United States. He is Visiting Professor at the Shanghai Conservatory in China, as well as the Sichuan Conservatory and Shanghai Normal University. He is President of the U.S. Music Certification Exams.

Interest in his philosophical and cognitive approach to music teaching has resulted in appearances across the US, Canada, Europe, Asia, Australia, and South America, including workshops and showcases at every Music Teachers National Association Conference since 1999. But he has never lost the ability to see humor in the profession and laugh.

A long-time teacher of prize-winning students in Irvine, California, Dr. Smith's students were the California State Champions for many years between 1988-2009. Former students have been First Prize winners in the Naftsgger Competition, Tchaikovsky Competition, the Bachauer Competition (Juilliard) and in MTNA competitions. A chamber music coach as well as piano teacher, Scott McBride Smith coached the Wakarusa Trio to the 2013 First Place in the MTNA Chamber Music (Strings) national competition. The group went on to win the Coleman-Barstow Prize at the 2014 Coleman Chamber Music Competition. Another Smith-coached group, Trio Soave, won Third Place in the 2016 MTNA Chamber Music (Strings) national competition. Private piano students were MTNA National Finalists in 2017 and 2018.

Dr. Smith is co-author of the college text *The Well-Tempered Keyboard Teacher* and associate editor of the magazine *Clavier Companion*. He is co-author of *Christopher Norton's Guide to Microjazz*.

Dr. Smith has served as Visiting Professor at the Shanghai Conservatory and the Sichuan Conservatory in China; the Béla Bartók Conservatory in Lima, Peru; at the Hong Kong Academy of Performing Arts; and in Taiwan, sponsored by the International Piano Teaching Foundation.

Scott McBride Smith received his doctorate from the University of Southern California, where he was co-winner of the Outstanding Graduate in Piano award.

**Affiliation:** Cordelia Brown Murphy Professor of Piano Pedagogy, University of Kansas, US  
**Email:** [smcbsmith@ku.edu](mailto:smcbsmith@ku.edu) **Orcid:** <https://orcid.org/0000-0002-7077-7646> **Web site:** <http://www.scottmcbridesmith.org/>

## References

- Bamberger, Jeanne. "Learning from the Children We Teach." *Bulletin of the Council for Research in Music Education* 142 (Fall, 1999): 48-74.
- Cameron, Claire E., Laura L. Brock, William M. Murrah, et al. "Fine Motor Skills and Executive Function Both Contribute to Kindergarten Achievement." *Child Development* 83 no. 4 (July-August, 2021): 1229-1244.
- Czerny, Carl. *Letters to a Young Lady on the Arts of Playing the Pianoforte*. Translated by J.A. Hamilton. New York: Hewitt & Jacques, 1837-1841. Reprint Da Capo Press, 1982.
- Dunning, David and Justin Kruger. "Unskilled and Unaware of it: How Difficulties in Recognition of One's Own Incompetence Lead to Inflated Self-Assessments." *Journal of Personality and Social Psychology* 77 no.6 (December, 1999): 1121-1134.
- Goertzen, Valerie Woodring. "By Way of Introduction: Preluding in 18th- and Early 19th-Century Pianists." *The Journal of Musicology* 14 no.2 (Summer, 1996): 299-337.
- Gordon, Edwin E. *Learning Sequences in Music*. Chicago: G.I.A. Publications, 1980.
- Habibi, Assal, Beatriz Ilari, Katrina Heine, et al. "Changes in Auditory Thickness Following Music Training in Children: Converging Longitudinal and Cross-Sectional Results." *Brain Structure and Function* 225 (2020): 2463-2474.
- Hamilton, Kenneth. *After the Golden Age: Romantic Pianism and Modern Performance*. Oxford: Oxford University Press, 2008.
- Holst-Wolf, Jessica M, I-Ling Yeh, and Jürgen Konzak. "Development of Proprioceptive Acuity in Typically Developing Children: Normative Data on Forearm Position Sense." *Frontiers in Neuroscience* 10 (2016). Accessed July 28, 2021. <https://www.frontiersin.org/articles/10.3389/fnhum.2016.00436/full>.
- Hund-Georgiadis, Margret and D. Yves von Cramon. "Motor-Learning Related Changes in Piano Players and Non-Musicians Revealed by Functional Magnetic-Resonance Signals." *Experimental Brain Research* 125 (1999): 417-425.
- Kent, Michael. *The Oxford Dictionary of Sports Science and Medicine*. Oxford: Oxford University Press, 2006.
- Komlós, Katalin. "Mozart and Clementi: A Piano Competition and Its Interpretation." *Historical Performance* 2 no.1 (Spring, 1989): 3-9.
- Lior, Lia. "In Music Nothing is Worse than Playing with Wrong Notes." *Journal of Historical Research in Music Education* 38 no.1 (October, 2016): 5-24.
- Lloyd, Meghann, Travis J. Saunders, Emily Bremer, et al. "Long-Term Importance of Fundamental Motor Skills: A 20-Year Follow-Up Study." *Adapted Physical Activity Quarterly* 31 (2014): 67-78.
- Merrick, Frank. *Practising the Piano*. London: Barrie and Rockliff, 1958.

- Muthkrishna, Michael, Joseph Heinrich, Waturu Tokokawa, et al. "Overconfidence is Universal? Elicitation of Genuine Overconfidence (EGO) Procedure Reveals Systematic Differences across Domain, Task Knowledge, and Incentives in Four Populations", *PLoS One* 13 no.8 (2018). Accessed August 1, 2021. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0202288>.
- Newcomb, Ethel. *Leschetizky As I Knew Him*. New York: Da Capo Press, 1967.
- Ortmann, Otto. *The Physiological Mechanics of Piano Technique*. New York: E.P. Dutton, 1929, Da Capo Press reprint, 1981.
- Price, Cynthia J. and Carole Hooven. "Interoceptive Awareness Skills for Emotion Regulation: Theory and Approach of Mindful Awareness in Body-Oriented Therapy (MABT)." *Frontiers in Psychology* 9 (May 2018). Accessed June 19, 2021. <https://www.frontiersin.org/articles/10.3389/fpsyg.2018.00798/full>.
- Price, Cynthia J., Elaine A. Thompson, Sheila A. Crowell, et al. "Immediate Effects of Interoceptive Awareness Training through Mindful Awareness in Body-oriented Therapy (MABT) for Women in Substance Use Disorder Treatment." *Substance Abuse* 40 no.1 (2019): 102-115.
- Seeger, Pete. *Henscratches and Flyspecks*. New York, NY: Berkley Medallion Books, 1973.
- Thayer, Alexander. *Life of Beethoven*. Revised and edited by Elliott Forbes. Princeton University Press, 1991.
- Wu, Tao, Piu Chan, and Mark Hallert. "Movement Automaticity Shows Less Activation, but More Connectivity: A Model for Brain Efficiency." *Physiology News* 73 (Winter, 2009). Accessed July 30, 2021. <https://www.physoc.org/magazine-articles/movement-automaticity-shows-less-activation-but-more-connectivity-a-model-for-brain-efficiency/>.
- Yasuda, Kazuhiro, Yuki Sato, Naoyuki Iiumra, et al. "Allocation of Attentional Resources Toward a Secondary Cognitive Task Leads to Compromised Ankle Proprioceptive Performance in Healthy Young Adults." *Rehabilitation Research and Practice* (2014). Accessed August 5, 2021. <https://www.ncbi.nlm.nih.gov/www2.lib.ku.edu/pmc/articles/PMC3910264/?tool=pmcentrez&report=abstract>.
- Zuk, Jennifer, Christopher Benjamin, Arnold Kenyon et al. "Behavioral and Neural Correlates of Executive Functioning in Musicians and Non-Musicians." *PLOS ONE* 13 no.1 (2014, corrected 2015 and 2018). Accessed July 29, 2021. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0099868>.