

Physical and Musical Techniques for the Expressive Marimbist

By
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Abstract

This is an examination of pedagogical techniques to be taught to marimba and percussion students in order to improve the technical aspects of quality sound production. Examined first is the interpretation of time and techniques used to improve performing precise metronomic time. Secondly, specific movements of the body are discussed in an effort to minimize the risk of pain or injury after prolonged practice. The second section also addresses the concept of controlling the breath while performing and how breathing techniques from other musical activities can be translated to the marimba and other percussion instruments. Lastly, the paper discusses controlling the stroke speed while playing, which can improve musical interpretation.

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Introduction

The goal of this paper is to discuss pedagogical approaches to the marimba that facilitate more flexible musicianship. I hope to provide a toolbox of physical techniques addressing rhythmic development, stroke speed, and physical demeanor that percussion teachers can use to broaden and deepen the awareness and musical flexibility of their students. While these techniques are inspired by my own experiences as a percussionist, my experiences as a teacher and performer have shown me that a discussion of these issues will be valuable to many percussion students and teachers.

My pedagogical methods are driven by my previous instruction personal experiences from injury. This paper will describe the type of training and musical education I received in Taiwan and the United States. After studying percussion for twelve years in Taiwan, I moved to the United States to pursue a Master of Music degree at New York University (NYU). I began studying at the University of Kansas (KU) in 2011 and encountered a serious problem with tendonitis. I will describe how these experiences shaped my own practice, and what methods I currently employ in order to be a more effective teacher for my percussion students.

The first section of this paper addresses timing. I will discuss the inadequacies of my initial training, briefly describe how I learned of my rhythmic deficiencies, and how I help my current students avoid such problems. Rhythmic timing was one of the first elements of my practice that I had to refine. During my first experiences with the chamber music ensemble at NYU it became clear that my prior training in rhythm and time was deficient. Prior to coming to the United States, many of my teachers did not emphasize the importance of playing with a metronome. Instead, I was taught to play rhythms without using the assistance of fixed time. Since I was playing as the instructors in Taiwan had coached me without emphasis on rhythmic

precision, there were inconsistencies in my performance that made it difficult to coordinate with other players in the ensemble. My music teachers taught me to play each different instrument with various interpretations of rhythmic precision and timing and as a result I was unprepared for the exactness of percussion ensemble performance at NYU.

The second section of this paper focuses on body control. I will discuss techniques I have adopted to control my posture and body movement, expand upon ideas concerning arm usage and stroke type discussed in the previous section, and describe how I explain the importance of these body orientations to my students. I focus on my body in practice sessions just as much as I focus on the sounds of the instrument. After struggling with tendonitis, controlling my body has evolved from basic striking techniques to a complete control of my breathing and stance. These techniques are easily applied to all of the percussion instruments whose repertoire demands repetitive physical motion. Breathing is another important aspect of body control. Thinking carefully about breathing is contrary to how my first marimba teacher trained me: he insisted that I was only interrupting the performance with my breath. However, after observing string instruments performers, I found that breath control was not just a function of the body, but a controlled movement that aided performance. Breath control will continue to be an important part of both my practice and my teaching.

The final section of my paper addresses the nuance of stroke speed. I will discuss how different methods of striking notes effect the tone and mood of a piece and provide observations of my own stroke speed techniques. To highlight how stroke speed can contribute to the tone of the piece, I will examine three contrasting works, Johann Sebastian Bach's Violin Sonata no .1 in G Minor BWV 1001, Chen Yi's *Jing Marimba* and John Psathas's *One Study One Summary*:

*Marimba, Junk Percussion and Digital Audio.*¹ Lastly, I will describe how I integrate activities concerning stroke speed into my students' lessons. Stroke speed is an aspect of my playing that went unnoticed until I began to observe the mood and the tone of particular pieces. During graduate work at KU, I realized how small nuances in stroke type affected the tone of my playing. One of the most important factors to creating a variety of tone colors is stroke speed. I discovered that the only way I could continue to play without pain while recovering from tendonitis was to vary my stroke speed and arm movements as I did playing the yangqin and the taiko.²

For my lecture recital I chose *One Study* by John Psathas, *Jing Marimba* by Chen Yi and *Adagio* from Violin Sonata No .1 in g minor, BWV 1001 by J.S. Bach. These particular pieces exemplify the musical, technical, and physical challenges examined in this paper.

¹ Many elements go into tone production on the marimba - type of mallets, where the bar is struck etc. This paper

² Yangqin is a Chinese hammer dulcimer and the Taiko is a Japanese drum. I studied both instruments in Taiwan between 2002-2009.

Time

Time is a critical element (microstructure) of expressive music, similar to dynamics and articulation.³ While musicians generally have a good understanding of time, most do not understand how it can be used in performance to add expression to the music.⁴ Inappropriate variations in time or the inability to play together with other members of an ensemble can ruin a performance. For the purposes of this paper, I will make a distinction between metronomic time (sometimes referred to as playing "in time") and "flowing time." Metronomic time means to play with a strict adherence to the tempo and meter and flowing time uses a more flexible interpretation of these elements.

Percussionists generally play rhythms metronomically and this is referred to as "playing in time." Pianists in contrast, use time quite differently from percussionists. Piano music from the Romantic Style Period tends to require a flexible, flowing time where the evenness of the rhythm is not as important as the mood and feeling of time. However, playing percussion instruments typically require performers to have exact, metronomic time. An understanding of the contrast between the two types of time and how to train for them are lacking in some percussionists today.

Petri Toiviainen and Joel Snyder discuss sensorimotor synchronization as a natural process of aligning motor systems with periodic stimuli.⁵ Synchronization to uniformly even stimuli, such as a metronome, trains a musician to play and perform in time. This is done in two

³ Grove Music Online, s.v. "Time," by Justin London, accessed October 25, 2017, <http://www.oxfordmusiconline.com.www2.lib.ku.edu/subscriber/article/grove/music/43935>.

⁴ Bruno H Repp, "Variations on a Theme by Chopin: Relations between Perception and Production of Timing in Music," *Journal of Experimental Psychology: Human Perception and Performance* 24, no. 3 (06, 1998): 791-811, <http://dx.doi.org.www2.lib.ku.edu/10.1037/0096-1523.24.3.791>. <https://search-proquest-com.www2.lib.ku.edu/docview/614328298?accountid=14556>.

⁵ Petri Toiviainen and Joel S. Snyder, "Tapping to Bach: Resonance-Based Modeling of Pulse," *Music Perception: An Interdisciplinary Journal* 21, no. 1, (Fall 2003): 45. <https://doi.org/10.1525/mp.2003.21.1.43>.

stages. Stage one is to perceive the external stimuli and stage two is to perform a motor function in sync with the perceived stimuli. If a student is taught to play without the assistance of the external stimuli they may not be playing in time even though they believe they are. The specifics of Toivainen and Snyder's methods used to measure a person's ability to detect time, or in this study the pulse, are beyond the scope of this paper; however, the conclusions insist that a listener's ability to hear and detect the stimuli greatly increases their ability to perform motor synchronization.

Synchronizing with external stimuli teaches performers to synchronize with other performers. When doing technical exercises, I have my students (and myself) play with pop music tracks from Spotify. It teaches them to both play with parts in unison with theirs and to listen more broadly to the overall sound of the ensemble.

The contrast between metronomic and flowing time creates rhythmic complications, especially when playing percussion chamber music. By "flowing time" I mean when a performer emphasizes certain notes or phrases with rhythmic placement, rather than varying the volume, tone color, or other musical parameters. Flowing time is an idea I use to consciously play not in metronomic time and is usually used on the strong beat. The sense of pulse, time, and rhythm are maintained without strict metronomic time. Rather than a disproportionate push and pull of tempo, flowing time is a more subtle emphasis. As the ability to command and understand time and rhythm increases, musicians grow to have greater flexibility and responsiveness.

Some examples of music that emphasize the importance of metronomic time are Nigel Westlake's *Omphalo Centric Lecture* (1984), Steve Reich's *Clapping Music* (1972), and Reich's *Mallet Quartet* (2009). Without a clear understanding of the concept of time, a student is unable

to understand the notes and the rhythm of the composition, and therefore unable to play precisely with the other performers.

In order to prevent these possible deficiencies, students should begin practicing alone with a metronome. This practice may seem tedious and time-consuming but it is essential to understand the importance of steady metronomic time. Unintentional changes of tempo or pulse indicate a poor sense of time. Regularly using the metronome in practice allows individuals to compare and correct their internal pulse and it is an essential practice for percussionists. Allowing the metronome to replace the sense of an internal pulse during practice is inefficient and disadvantageous so while regular metronome work is necessary, individuals should also strive to develop a strong internal counting practice.⁶

Internal Counting Practice

Internal counting practice is an effective way for a performer to strengthen their ability to play strictly in metronomic time. The key for internal counting practice is to subdivide with a metronome and then gradually taper to use less reference points. It requires performers to train their internal counting in between reference points in order to build relationship with a larger (and further apart) pulse.

Students should practice playing a one-octave C Major scale at a slow tempo (50 beats per minute) using quarter notes. Internally they will subdivide the large and slow pulses into smaller notes (e.g. sixteenth notes or triplets). When in exact alignment, the player should not hear the metronome's click. After playing quarter notes I ask the student to play eighth notes at the same tempo while still subdividing internally (shown in Figure 1). Lastly, the student plays

⁶ Jeremy Epp, "Strategies for Better Time and Rhythm," updated on May 12, 2017, https://www.jeremyeptimpani.com/single-post/2017/05/12/Strategies-for-better-time-and-rhythm?fb_comment_id=498565126933755_500018990121702.

triplets followed by sixteenth notes. This emphasis on internally hearing and feeling subdivision allows a percussionist to feel the time between notes rather than just guessing at their placement and to evaluate how accurate their own pulse is within the metronome's click.

Figure 1: Time Practice Exercise

Time Practice Exercise

The musical score is titled "Time Practice Exercise" and is set at a tempo of $\text{♩} = 50$. It consists of five systems of music, each with a Marimba (Mrm.) part and a Counting part. The Counting part is written on a bass clef staff with a 5/4 time signature. The Marimba part is written on a treble clef staff. The first system shows the Marimba playing a sequence of quarter notes: C4, D4, E4, F4, G4, A4, B4, C5. The Counting part plays a steady stream of sixteenth notes. The second system continues the Marimba sequence with quarter notes: C5, B4, A4, G4, F4, E4, D4, C4. The Counting part continues with sixteenth notes. The third system shows the Marimba playing eighth notes: C4, D4, E4, F4, G4, A4, B4, C5. The Counting part continues with sixteenth notes. The fourth system shows the Marimba playing a sequence of eighth notes: C4, D4, E4, F4, G4, A4, B4, C5, D5, E5, F5, G5, A5, B5, C6. The Counting part continues with sixteenth notes. The fifth system shows the Marimba playing a sequence of eighth notes: C6, B5, A5, G5, F5, E5, D5, C5, B4, A4, G4, F4, E4, D4, C4. The Counting part continues with sixteenth notes. The score includes various musical notations such as triplets, sixteenth notes, and rests.

Subtracting Beats

Subtracting beats is an exercise used to improve a performer's ability to play strictly in time. The goal is to begin with a metronomic marking and beat subdivision in the student's comfort zone and then to adjust the time and subdivision until the individual is able to perform the piece utilizing only their internal metronome.⁷

The first step of this procedure is for the performer to choose a piece of music and practice it metronomically without modifying any beats or rhythm. They will set the metronome to the smallest subdivision in the passage. As shown in Figure 2, rehearsal A, the performer should use the metronome to highlight the sixteenth notes in a sixteenth-note passage where that is the smallest note value. Next, the performer repeats the same piece and carefully observes whether or not they are firmly aligned with the metronome. They need to be conscious of any passages that force them out of time and these passages should be practiced until mastered. After mastery, the performer should reduce the number of subdivisions played by the metronome as shown in Figure 2, rehearsal B. This increases the time between reference points for the performer. Upon mastery of precise alignment with fewer references, the performer should continue decreasing the number of metronome reference points as shown in Figure 2, at rehearsal C, E, and G. After careful practice, the performer can once again reduce the number of metronome references based on their comfort and being able to maintain rhythmic steadiness.

In the final step of the process, the performer should reframe the metronome's beat as a note other than the downbeat as shown in Figure 2, rehearsal D and F. This will prevent the performer from playing disproportionately or unevenly between metronome reference points.

⁷ Epp, "Strategies for Better Time and Rhythm."

Periodically the player should increase the metronome references to verify that they are still playing strictly in time and not just on the fewer references that may occur later.

Figure 2: Subtracting Beats Practice

Subtracting Beats Practice

$\text{♩} = 80$

A

Marimba

Metronome Click

B **C**

Mrm.

D

Mrm.

E **F**

Mrm.

The musical score is written in 4/4 time with a tempo of 80 beats per minute. It consists of six sections, A through F, each with a Marimba part and a Metronome Click part. Section A is the first section, starting with a tempo marking of 80. Section B starts at measure 3, Section C at measure 4, Section D at measure 6, Section E at measure 9, and Section F at measure 10. The Marimba part consists of eighth-note patterns, and the Metronome Click part consists of quarter-note patterns. The score is divided into six sections (A-F) with corresponding measure numbers.

Mrm.

12

G

14

12

13

14

Practicing Rhythm

Accurate time does not equate to accurate rhythm. Rhythm refers to what happens within time, or pulse. For example, two eighth notes in the space of a quarter note is an example of rhythm and two uneven eighth notes in the space of a quarter note would be an example of a rhythmic problem.⁸ One way of alleviating this issue is to focus on the smallest subdivision within the pulse. Aligning the metronome's clicks with the smallest subdivision and setting a slower tempo allows an individual to place more attention on accuracy and maintaining rhythmic integrity. Players can practice reducing the metronome's subdivisions as the tempo increases. Once you reach the goal tempo, you can also practice the tempo above and below that goal to increase flexibility in performance. Percussionists are expected to play with a steady pulse, accurate rhythms, and even beats. Ensemble performance requires students to play precisely and accurately with others.

John Psathas, *One Study One Summary: Marimba, Junk Percussion and Digital Audio*

While it is important to be able to play with a steady, controlled pulse, percussion repertoire often demands extreme precision. John Psathas's composition *One Study One Summary: Marimba, Junk Percussion and Digital Audio* is performed with a fixed audio recording. Since the recording cannot adapt, the performer must play with a strict adherence to time. When preparing this piece, I begin with a metronome setting of sixty beats per minute, with

⁸ Epp, "Strategies for better time and rhythm."

a sixteenth-note subdivision. This tempo and subdivision allows me to focus on rhythmic integrity. I slowly increase the metronomic marking until the goal tempo of 126 beat per minute (bpm) is reached.

One Study includes cues for the fixed audio track as shown in in Figure 3 on the smaller staves.⁹ Performers have to know both parts and subtraction practice can be used to learn the piece. Often the pulse of the music is very subtle in the fixed audio track so a successful performance relies heavily on the player's internal metronome.

Figure 3: John Psathas, *One Study*, mm. 1-5

The image displays a musical score for three instruments: Marimba, Ultrabeat, and CR-78 (or CR.). The score is divided into two systems. The first system covers measures 1-5. The Marimba part begins with a treble clef and a key signature of one flat (B-flat). It features a dynamic marking of *f* (forte) followed by *p* (piano). A section labeled 'Technoir' is indicated above the Ultrabeat staff. The Ultrabeat part consists of a rhythmic pattern of eighth notes. The CR-78 part provides a steady accompaniment of eighth notes. The second system continues the music, with the Marimba part featuring a triplet of eighth notes marked with a '3' above the staff. The Ultrabeat and CR. parts continue their respective rhythmic patterns.

⁹ John Psathas, *One Study One Summary: Marimba, Junk Percussion and Digital Audio* (Wellington: Promethean Editions, 2008), 1.

Johann Sebastian Bach, Violin Sonata no. 1 in G Minor, BWV 1001

Rebecca Kite claims that the rhythms in Bach's music should not be played in metronomic time as a snare drummer would play.¹⁰ When playing snare drum, the clarity of rhythm and evenness between notes are more important elements than the mood and feeling of time. Nancy Zeltsman's shared idea for playing convincing and expressive rubato is to subdivide the rhythms into the smaller units and smoothly slow down or speed up the tempo.¹¹

As shown in Figure 4, the first measure of the *Adagio* from Bach's Violin Sonata no. 1 in G Minor, BWV 1001 is crucial because it serves to set the tempo and introduce the entire sonata.¹² Many players, both string and percussion alike, have wildly different interpretations of time in this measure, especially concerning the rhythmic range between quarter and sixty-fourth notes.

Figure 4: J.S. Bach, *Adagio* from Violin Sonata No .1 in G Minor, BWV 1001, mm. 1-2



While preparing this passage, I practice multiple subdivisions of the beat including quarter, eighth, sixteenth, and thirty-second notes. The thirty-second note subdivision feels the

¹⁰ Rebecca Kite, "From Bach to Blues: The Art of Musical Styles for the Marimba," *Percussive Notes*, 36/5 (October 1998): 40.

¹¹ Nancy Zeltzman, *Four- Mallet Marimba Playing: A Musical Approach for All Levels* (Milwaukee, WI: Hal Leonard, 2003), 10.

¹² Johann Sebastian Bach, *Three Sonatas and Three Partitas for Solo Violin*, (Kassel: Barenreiter, 1958): 1.

most stable, but it encourages a more rigid and less-expressive performance. When I practice subdividing the passage multiple ways, I have more freedom for pushing and pulling the time.

Chen Yi, *Jing Marimba*

Folk music often uses a more free and flexible sense of time. The opening of Chen Yi's *Jing Marimba*, shown in Figure 5, employs a typical fiddle pattern from Beijing Opera and serves as an example of flexible time.¹³

Figure 5: Chen Yi, *Jing Marimba*: mm. 1-4



Because Chen Yi writes that, “The characteristics of the musical image are lively, bright, and playful,”¹⁴ I practice with the metronome set on a bigger pulse (quarter note) and then an eighth-note subdivision to bring out a lively, light, and steady metronomic time. I use the fiddle’s technical aspects to inform my interpretation. On the fiddle, the interval of a seventh is large, and often requires time to prepare. If a marimbist plays the first eighth notes of this piece perfectly in time the fragment will lose the folk flavor. Thus, counting a smaller subdivision than the quarter note would not be suitable.

¹³ Yi Chen “Jing Marimba for Solo Marimba,” in *Intermediate Masterworks for Marimba*, ed. Nancy Zeltsman, vol. 2, (New York: C.F. Peter Corporation, 2009), 11. Chen is family name and Yi is personal name. In Chinese culture, the order of names starts with family name followed with personal name. Chen Yi can be referred to Dr. Chen but not Dr. Yi. For the purposes of this document, I will refer to her as Chen Yi.

¹⁴ *Ibid.*

Body Control

Roland Kushner writes, "The stage is a place to connect performances and audiences through experiences."¹⁵ Using physical gestures in performances of Western music as a tool for performers to connect with audiences is a highly debated topic.¹⁶ Researchers believe visual gestures during a performance increase how much expression the audience perceives, even though it is not part of the process of sound production.¹⁷ Ancillary gestures and movements that do not produce sound visually reflect mood and musical aspects. For example, string instruments offer a more visual performance than the clarinet.¹⁸ Chia-Jung Tsay's conducted experiments where both experts and novices were asked to indicate the highest quality performances. The subjects in the experiment were separately exposed to audio recordings only and audio and visual recordings of performances. When the audio and video were observed at the same time, the subjects utilized "sight over sound in the judgment of music performance."¹⁹ Because of her research, Tsay believes that the music should determine the visual movements employed by performers. Professionals must hone these skills in order to avoid overemphasizing the visual aspect of performance and reducing the quality of music.²⁰

While the link between sight and sound is well established in professional performance, our physical demeanor is important to marimba playing at a more basic level. By developing an awareness of body positioning and movement at the marimba, percussionists will be able to play in a more relaxed manner, prevent injury, and offer a visually high-quality performance.

¹⁵ Roland J. Kushner, "Understanding the Links between Performing Artists and Audiences," *The Journal of Arts Management, Law, and Society* 33, issue2 (Mar 2010): 114.

¹⁶ Tyson J. Voigt, "Hearing What You See: A Case for the Use of Ancillary Gesture in Individual Percussion Performance" (D.M.A. diss., University of Miami, 2016), 1.

¹⁷ Jane W. Davidson, "The Role of the Body in the Production and Perception of Solo Vocal Performance: A Case Study of Annie Lennox," *Musicae Scientiae* 5, no.2 (Fall 2001): 235.

¹⁸ Voigt, "Hearing What You See," 1.

¹⁹ Chia- Jung Tsay, "Sight Over Sound in the Judgment of Music Performance," *PNAS* 110, no.36 (July 2013): 14583.

²⁰ *Ibid.*, 14584.

Posture

Most percussionists stand centered at the marimba in a way that allows them to reach the highest and lowest bars of the instrument. This causes players to lean awkwardly over the keyboard in an attempt to reach certain notes. A centered position causes two things that players should strive to avoid. First, it changes the stroke distance and therefore the speed needed to strike the bars and play in tempo. For example, if a player is leaning towards the left, their right arm has an unbalanced stroke. Secondly, leaning from the center creates a great deal of back pain after prolonged periods. Research by Kellie C. Huxel Bilven and Barton E. Anderson suggests that an imbalanced amount of strain on unconditioned lower extremities can cause lower back pain and pain in the hip region.²¹ In order to avoid such issues, squatting and stepping should be used to create an even, pain-free body stance. Figures 6A and 6B illustrate a player leaning awkwardly towards each end of the marimba. Figures 6C and 6D depict a player with a slight bend in the knee in the direction of the notes that they're playing, which allows the player to extend and more easily reach the end of the marimba.

Figure 6: In 6A and 6B the player is leaning awkwardly and in 6C and 6D she is leaning with a slight bend in knee.



²¹ Kellie C. Huxel Bilven and Barton E. Anderson, "Core Stability Training for Injury Prevention," *Sports Health* 5.6 (Nov. 2013): 514–522.

Straddle

Rather than leaning awkwardly towards the high or low end of the marimba, I teach my students to “straddle” the keyboard. Straddling involves moving the feet from left to right one at a time without the feet crossing over each other. This ensures that the player is near the center of the bars that must be struck. Problems arise when students straddle from side to side quickly, which changes the player’s height. When the student’s legs are spread out, the distance from the top of the stroke to the bars becomes slightly less than when the student is standing directly over the center of the bars with their feet closer together. In order to better straddle the marimba players must learn to squat so that they keep their torso straight and aligned with their hips. Figure 7A shows the starting position while Figure 7B demonstrates the left foot moving to meet the right. Figure 7C shows the right leg moving away from the left leg, returning the performer to a shoulder-width stance. I employ use these same three steps in *One Study*, notated by the arrows in Figure 8.²²

Figure 7: Straddle Position



²² Psathas, *One Study One Summary*, 60.

Figure 8: Psathas, *One Study*, m. 60

Squatting

According to Nancy Zeltsman, bending one's knees can help the performer play more powerfully.²³ First, one must practice squatting in order to control the lower torso and to allow the upper torso to remain free while playing. In Chinese, this is called *mǎbù*, or horse-riding stance. Taiko master Meng Zhang writes that practicing relaxation is crucial to playing this instrument and the performer has to relax all of their muscle groups.²⁴ Figure 9A demonstrates a straight-legged posture, while Figure 9B shows a squat recommended by Zhang. The arrows in Figure 10 indicate an instance where I use the squatting technique in *One Study*.²⁵

²³ Zeltsman, *Four Mallet Marimba Playing*, 5-6.

²⁴ Meng Zhang, “再议鼓类打击乐器的演奏技巧” [Performance Technique of Membranophone Percussion Instruments], *China Academic Journal Electronic Publishing House*, 艺术研究：哈尔滨师范大学艺术学院学报 1 (2017): 115.

²⁵ Psathas, *One Study One Summary*, 9.

Figure 9: Squatting Position

Figure 10: Psathas, *One Study*, m. 9

Crab Stepping

Marching percussionists utilize a technique known as crab stepping.²⁶ It is a technique that involves maintaining a frontal orientation to the audience while moving sideways and requires the feet to cross over one another. The technique is useful when playing long, linear lines on the marimba, such as those that occur in *Jing Marimba*. The movement is different from the straddling technique that is used when the player changes positions quickly while playing. The crab step should make full use of the squat in order to keep the player's torso level and the

²⁶ Tyler Dempsey, "The Band Director's Guide to Fall Marching Percussion," (paper presented at Texas Bandmasters Association 2011 Convention/Clinic, San Antonio, Texas, July 2011), 9.

stroke distance consistent. Figures 11A-D outline the crab step. Figure 11A shows the starting position with the knees slightly bent, Figure 11B the placement of the legs when the feet are crossing, Figure 11C the shifting of the weight from the right to the left leg, and Figure 11D the uncrossing of the legs. The arrows in Figure 12 show how works in *Jing Marimba*.²⁷

Figure 11: Crab Stepping



Figure 12: Chen Yi, *Jing Marimba*, mm. 177-180

²⁷Yi Chen “Jing Marimba for Solo Marimba,” in *Intermediate Masterworks for Marimba*, ed. Nancy Zeltsman, vol. 2, (New York: C.F. Peter Corporation, 2009), 15.

Breathe Control

The most efficient way to trigger muscle relaxation is controlled breathing.

I have found that students typically breathe with tiny sips of air as they play and I recall doing the same when I first began playing. My first percussion professor at the University of Kansas, Ji Hye Jung coached me to practice while only thinking about my breathing. The breathing increased my focus while playing, triggered muscle relaxation, and encouraged me to take deeper, longer breaths.

Breathing is not just for oxygen intake. It is not only linked to brain function and behavior but brain activity also impacts emotions and memory.²⁸ A study conducted by Christina Zelano found that breathing affects how we cope with anxiety and fear.²⁹ When in an environment full of fearful stimuli, the data indicates that individuals respond more quickly by inhaling through the nose, rather than through the mouth. At the beginning of a performance, most musicians need the most focus to confront their anxiety.

By linking our inhaling and exhaling to tension and contraction in music, we can challenge the widely held practice of doling out breath slowly and evenly and bring a new expressive realm to bear on our marimba playing. Cellist Gerhard Mantel talks about how breathing is interrupted not only by body movements, but also to a much greater extent by psychological processes.³⁰ He writes that players should breath as they would when singing. Additionally, Mantel argues that the common practice of holding ones breath before and during difficult passages so as to avoid an audible bump when playing is not a solution.

²⁸ Northwestern University, “Rhythm of Breathing Affects Memory and Fear,” interview by Christina Zelano. *Neuroscience News*, December 7, 2016, video, <https://www.youtube.com/watch?v=1KNn0NYjMWg>.

²⁹ Christina Zelano, Heidi Jiang, Guangyu Zhou, Nikita Arora, Stephan Schuele, Joshua Rosenow and Jay A. Gottfried, “Nasal Respiration Entrain Human Limbic Oscillations and Modulates Cognitive Function” *Journal of Neuroscience*, December 7, 2016.

³⁰ Gerhard Mantel, *Cello Technique: Principles and Forms of Movement* (Bloomington & London: Indiana University Press, 1975), 49.

Using your breath to feel your entire body and your instrument as a whole is important. *Strad* magazine recommends that string players practice with controlled breathing and this process can easily be modified to suit the percussionist.³¹ They recommend that the musician first allow their arms to hang loosely by their sides. Taking a big deep breath the individual should inhale through the nose and exhale through the mouth.

As the percussionist breathes in, their body expands and as they breathe out, their body softens and relaxes. Rather than having the mind lead the breath, the percussionist should allow the breath to lead the mind. If a player listens to some music with which they are familiar, they can take a moment to feel the state of their body and root their body weight into the ground through their feet. They can practice floating up and out as the musical tension builds and releases while keeping their breath in mind.

The percussionist should then repeat the previous exercise but with their arms held in a playing position, resting their wrists and mallets on the marimba. Marimbists should touch the resonators of the marimba with their bellies and feel the bars on the marimba as if they were their own vocal cords. With both hands resting on the bars of the marimba, they should feel their weight rooted on the ground. Ignoring the impulse to begin playing, the percussionist should stay connected to their breath. They should listen to the melody one more time and play a quarter note on each bar, alternating hands and allowing the breathing and playing to become one with the slow pulse of the music.

Finally, the percussionist should play the melody. They will then be more aware of the feeling of their own body breathing. Breathing is important during high-stress performances. Inhaling and exhaling to eliminate tension in the body as well as connecting the breath to the

³¹ Ruth Phillips, "How to Breathe Freely When Playing a Stringed Instrument," *Strad Magazine*, June 8, 2014, <https://www.thestrads.com/how-to-breathe-freely-when-playing-a-stringed-instrument/2894.article>.

rhythm will ease the player's ability to perform. After consistent practice, breathing will become a natural technique for the performer.

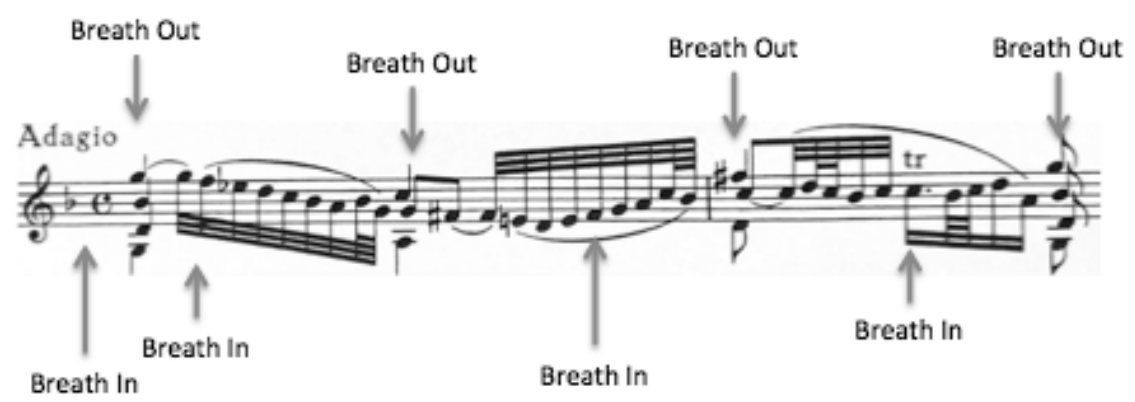
When training students for performances, I coach them to breath steadily with the mood and the tempo of the piece. If the tempo requires intense activity their breath should be triggered by specific notes (shown in Figure 13 and 14) and should be deep enough to fill their body with enough oxygen to continue playing. If the student is playing a slower or softer piece, the breathing should be slower and less forceful but still steady.

If a player imitates a singer they need to inhale in time before playing and exhale while the first note is played. When the performer breathes in, they prepare the oxygen and energy needed to play. Therefore, I suggest inhaling when the music builds in tension and breath out when musical tension is released.

When playing the passage shown in Figure 13, a performer should inhale before playing the first note and exhale while playing the downbeat.³² In beat 2 and 4 of measure 1, a performer should inhale while giving the music direction that leads to the chords on beat 3 and downbeat of measure 2. When a performer is playing the chords, I recommend exhaling to avoid the overemphasis of the chords with a louder dynamic as four mallets strike the marimba at the same time. When tension is released on beat 4 on the second measure, a performer should exhale for the same reason.

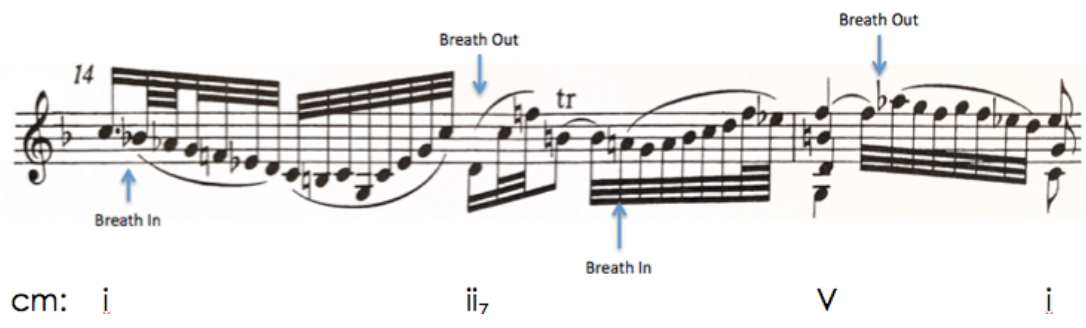
³² Bach, *Three Sonatas*, 1.

Figure 13: Bach, *Adagio*, mm.1-2



The passage shown in Figure 14 is building in tension with the ii chord of c minor in beats 3 and 4 of measure 14.³³ A performer should inhale during this section to prepare their body for a louder dynamic, requiring more oxygen. The V chord that occurs on the downbeat of measure 15 is the most intensive moment before the resolution. A performer should inhale after the trill and exhale when the descending phrase begins on the second beat of measure 15. The music arrives on the tonic of c minor on beat 3 and completes a perfect authentic cadence.

Figure 14: Bach, *Adagio*, mm.14-15

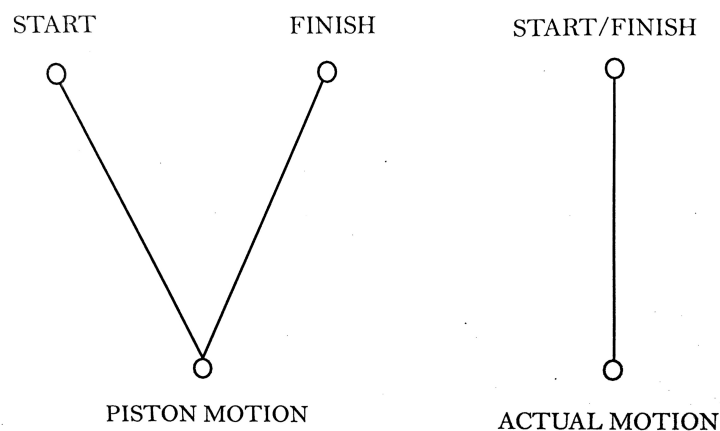


³³ Bach, *Three Sonatas*, 1.

Stroke Speed

Students often first learn to play from teachers who emphasize just hitting the instrument without further consideration but percussionists play more musically by controlling their stroke speed. In *The Book of Percussion Pedagogy: A Step-By-Step Approach for Teacher and Performers*, Cort McClaren recommends a piston stroke for all percussion performance.³⁴ The piston stroke shown in Figure 15 is an efficient stroke where the mallet begins at one height, moves to strike the instrument, and then immediately returns to the starting point. There is no wasted motion.³⁵ However, McClaren does not specify stroke speed.

Figure 15: Piston Stroke



Without developing an awareness of speed and acceleration, percussionists sound monotonous. In his book *Wrist Twisters*, Buster Bailey discusses how expressivity on percussion instruments should not proceed as a flat line (see Figure 16), but should rather be a constantly inflected pattern as shown in Figures 16 and 17.³⁶ This type of expressivity does not seem

³⁴ Cort McClaren, *The Book of Percussion Pedagogy: A Step-By-Step Approach for Teacher and Performers*, 2nd ed. (Greensboro: C. Alan Publications, 2006), 1.

³⁵ *Ibid.*, 5.

³⁶ Elden C. “Buster” Bailey, *Wrist Twisters* (New York: Marimba Publications, 1999), 16.

possible by using only a piston stroke. If stroke speed allows percussionists to play with a varied tone, then our pedagogical practice should include developing control of stroke speed. However, most of the extant literature on marimba strokes emphasizes different techniques independently rather than discussing their impact on expressive musicianship.

Figure 16: Monotous Stroke Speed

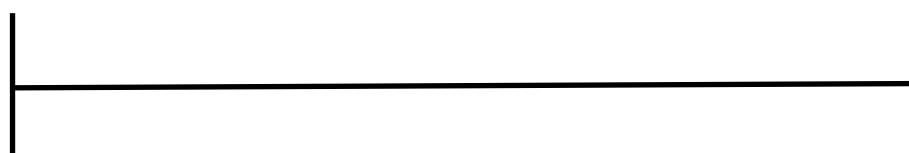


Figure 17: Constantly Inflected Pattern



Michael Haldeman describes how research has measured how stroke speed influences the overall sound of the notes played in his essay “Stroke Velocity in Two-Mallet Marimba Performance.”³⁷ Haldeman advises that playing notes as fast as possible is poor practice for two reasons. First, we want students to be able to play with correct timing in an ensemble. Secondly,

³⁷ Michael E. Haldeman, “Stroke Velocity In Two- Mallet Marimba Performance,” (D.M.A. diss., University of North Carolina, 2008), 7.

the lower register on the marimba requires less speed than the higher register due to the difference in the size of the bars.³⁸

Zeltsman's method book outlines five additional parameters contributing to tone production: 1. How tightly or loosely the mallet is held; 2. The height from which the bar is struck; 3. How you come off the bar after making contact; 4. The speed of the downstroke; and 5. The speed of the upstroke.³⁹ Two of the five factors concern stroke speed. She argues that to produce a full stroke one should move the mallets slowly and stop the mallets a half inch above the surface of the bar after hitting. Zeltsman's discourages the use of mallet height as the sole controller of volume as it will lead to a thin and inconsistent sound.⁴⁰

While Zeltsman and Halderman present valid descriptions of how percussionists can adjust their sound on the marimba, they fail to discuss how to apply these concepts to performing expressively, using character as a determiner for stroke speed. Pius Cheung's ideas on marimba strokes may provide answers.

Controlling the Marimba Stroke

In his book *Colors*, Cheung describes a variety of stroke types, each of which combines notions of stroke speed, stick height, muscle use, and expressive intent. The "Slow Motion Stroke" is a deliberately slow stroke used to connect horizontal motion and the vertical motion of striking the marimba.⁴¹ He also describes a "Relaxed Stroke," a low energy attack that uses the least amount of energy to raise and lower the mallet to the bar being played.⁴² The "Normal Stroke" should be used to create a "clear but not pointed" tone and the "Assertive Stroke" should

³⁸ Michael E. Halderman, "Stroke Velocity In Two- Mallet Marimba Performance," 49.

³⁹ Zeltsman, *Four- Mallet Marimba Playing*, 10.

⁴⁰ Ibid.

⁴¹ Pius Cheung, *Colors – Intermediate Etudes for Marimba* (Richmond: Pius Cheung, 2011), 7.

⁴² Cheung, *Colors*, 7.

be used to create an accent.⁴³ The “Plosive Stroke Speed,” also called the “Military Stroke,” is an aggressive stroke, which produces a highly percussive tone.⁴⁴

Cheung’s descriptions are both musical and technical. That said, in my own playing and teaching I have found that specificity regarding muscle group can enhance these techniques. The parts of the body needed to make a convincing marimba stroke begin at the mid-section of the torso and end where the fingers grip the mallets. Controlling different parts of the body helps to control the speed of the stroke. For example, controlling only the fingers can create a small, fast stroke. If a slightly heavier sound with fast stroke speed is required, the performer should use a stroke controlled only by the wrists. The “Forearm-Stroke” is the next largest stroke and a bigger muscle group than the wrist or the finger stroke, so this stroke uses more energy than the previous two strokes. The last stroke type is the “Full-Arm-Stroke,” controlled by the entire arm as the name suggests. It should be used as an extremely heavy stroke and only employed when musically appropriate.⁴⁵

Slow Motion Stroke

I suggest expanding Cheung’s strokes to include a more specific description of the muscle group used. In the case of the Slow Motion Stroke, we have an initial forearm stroke with minimal wrist use. Usually this stroke is used at softer volumes so that performers do not need to use different stroke heights to aid with volume production. It should proceed with a slower speed in a circular motion without any tension in the arms or wrists.

⁴³ Cheung, *Colors*, 7.

⁴⁴ *Ibid.*, 8.

⁴⁵ These strokes should not be conflated with the musculature needed to move around the keyboard, which is typically done by the arms moving horizontally. The arm motion mentioned here are mostly more vertical.

In the *Adagio* from Bach's Violin Sonata no. 1, the performer should raise their arm and relax their wrist, allowing the mallet to flow with the fingers in order to create a softer and slower stroke. Shown in Figure 18, this linear and connected sound reminds me of how string performers articulated phrases.⁴⁶ With slow, legato music such as the *Adagio*, a lifted wrist should be used while maintaining the full range of arm motion (the slow motion stroke). Tension in the music occurs as a result of a perfect authentic cadence in G Minor in measures 20-21. Using little wrist motion with an initial forearm stroke creates a soft dynamic level and warm tone.

Figure 18: Bach, *Adagio* mm. 21-22



Relaxed Stroke

The relaxed stroke is used to put more arm motion in the stroke, initializing the movement with the forearm. The dynamic level for this stroke is louder than the slow motion stroke with a more open sound. The relaxed stroke can create a singing timbre that puts more energy through the resonators. Figure 19 shows an instance where the tonal center is still uncertain and the music is in the initial stage to build tension.⁴⁷ Even with a soft beginning, the relaxed stroke allows for a greater crescendo than the slow motion stroke.

⁴⁶ Bach, *Three Sonatas*, 1.

⁴⁷ *Ibid.*, 1.

Figure 19: Bach, *Adagio*, m. 11

Normal Stroke

Normal stroke initializes in the wrist motion and uses less movement of the forearm. It creates a blended and clear tone with moderate speed. This stroke is typically used as a default and is good for sight-reading. Figure 20 shows a passage from *Jing Marimba* that requires a clear and blended tone.⁴⁸ In the instance, I suggest using a normal stroke with moderate speed and less motion of forearm.

Figure 20: Chen Yi, *Jing Marimba*, mm. 44-45

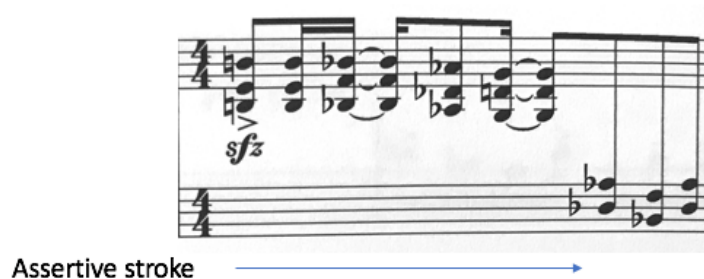
Assertive Stroke

The Assertive stroke is initialized in the wrist and uses the fingers rather than the arms to control the sound. It is played with faster a stroke speed than normal stroke. The assertive stroke can be used on music notes that are accented or have a louder dynamic marking and is

⁴⁸ Chen, "Jing Marimba for Solo Marimba," 12.

reminiscent of the throwing motion suggested by Bailey in *Wrist Twisters*.⁴⁹ Figure 21 shows a passage where a performer can use the assertive stroke to enforce the *sforzando*.⁵⁰ This facilitates a louder dynamic and faster stroke speed of the passage.

Figure 21: Psathas, *One Study*, m. 86



Plosive Stroke

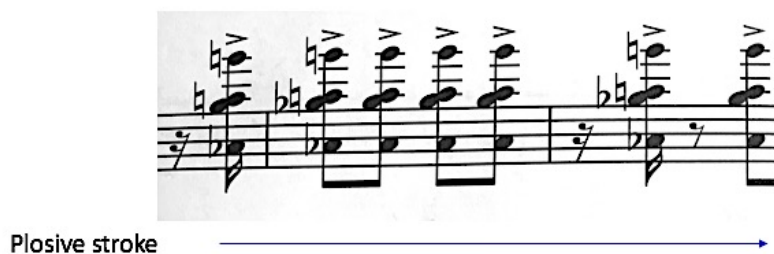
The Plosive stroke is often used in Eastern Asian marimba repertoire and involves gripping the fingers and moving the wrist quickly to create a percussive tone. Adjusting the mallet height can help to increase the volume and accelerating the stroke speed allows performers to create a sharp, bright tone. This sound, however, can be stiff and not at all flexible. In Figure 22, the music is extremely loud and in a high register where marimba bars are thicker and less responsive to volume.⁵¹ Therefore, it is suitable to use extremely loud and fast stroke speed to create a sharp and metallic sound.⁵² While practicing, it is important that the student maintains a low hand position so that all motions are coming directly from the wrist with biggest contact surface between mallets and marimba bars.

⁴⁹ Elden C. “Buster” Bailey, *Wrist Twisters*, 16.

⁵⁰ Psathas, *One Study One Summary*, 6.

⁵¹ Chen, “Jing Marimba for Solo Marimba,” 14.

⁵² This passage is intended to imitate the sound of metal percussion as heard in Peking opera.

Figure 22: Chen Yi, *Jing Marimba*, mm. 44-45

At the same time, musical tension seems to have some bearing on stroke speed. Like Haldeman, I believe that stroke velocity should increase in direct proportion to musical tension and players should attempt to use these stroke types in service of a significant musical end.⁵³

By practicing the strokes individually, however, an astute marimbist can easily recall the appropriate stroke to suit any situation. To aid stroke development, I recommend concentrating on what is between the notes even more than the notes themselves; this is what Steven refers to as “thinking space.”⁵⁴ Slow practice provides wider thinking space for a player to work on microscopic details like motion, interval change, and most importantly, proportionally slowing the velocity of strokes themselves.

We can take inspiration from how other instruments use stroke speed to control tone. The yangqin, a Chinese hammered dulcimer, requires a movement with strength in the arm, shoulder, elbow, and fingers to control tone. Both the yangqin and the taiko require different types of strokes to control their tone.⁵⁵ The static with fast speed sound that is created on the marimba will not translate to these two unique instruments.

⁵³ Haldeman, “Stoke Velocity,” 59.

⁵⁴ Leigh Howard Stevens, *Method of movement for Marimba with 590 exercises* (New York: Marimba productions, 1979), 4.

⁵⁵ Yuhong Xie, “如何弹奏出良好的扬琴音色 (上)” [Producing Fine Tones in Yangqin Performance Part 1], *China Academic Journal Electronic Publishing House*, 乐器 12 (2003), 33.

These strokes outlined have immediate musical applications in the *Adagio* from Bach's Violin Sonata no .1 in G Minor BWV 1001, Chen Yi's *Jing Marimba* and Psathas's *One Study*. These works require completely different tone qualities that can be aided by purposeful stroke selection.

Conclusion

This paper is not intended to provide an all-inclusive technical primer for the marimba. I attempt to give a detailed analysis of what I perceive to be the most important topics facing student and professional marimbists that are not adequately addressed in the standard percussion curriculum. While my own personal experiences have shaped these pedagogical developments, I hope that they are useful to a wide spectrum of percussionists. It is also my hope that other musicians utilize the techniques outlined in this paper and that this discussion inspires additional research into how teachers and performers of other instruments address body control and time during practice, rehearsal, and performance. The concept of monitoring individual posture and developing an awareness of how musculature controls sound is applicable to almost every instrument. For percussionists, the application of these techniques to a variety of instruments creates well-rounded and flexible playing.

Appendix

John Psathas - *One Study One Summary: Marimba, Junk Percussion and Digital Audio*

John Psathas is an active composer from New Zealand. His early success in 1991 with *Matre's Dance*, an energetic duet for percussion and piano, brought Psathas international recognition.⁵⁶ *One Study* is the first movement from *One Study One Summary: Marimba, Junk Percussion and Digital Audio*. The composition was commissioned by Pedro Carneiro and includes parts for fix digital audio, where the cues for the fixed media are provided on the smaller staves in the score. This piece can be performed with live marimba and junk percussion with audio or live marimba only with audio.⁵⁷

Chen Yi - *Jing Marimba*

Chen Yi's musical life started as a violinist and pianist when she was young and her musical style is strongly influenced by Chinese music she encountered while working as the principle violinist for the Guangzhou Chinese Opera troupe. As a composer, she received the Charles Ives Living Award from the American Academy of Arts and Letters in 2001 and was elected to the American Academy of Arts & Sciences in 2005. Chen Yi is currently a professor at the Conservatory of Music and Dance at the University of Missouri-Kansas City.⁵⁸ The idea for *Jing Marimba* was taken from traditional Chinese fiddle melodies. She used the melody

⁵⁶ John Psathas, "John Pasthas," program notes for *One Study One Summary: Marimba, Junk Percussion and Digital Audio*, (New Zealand: Promethean Editions, 2005.), ii.

⁵⁷ *Ibid.*, v.

⁵⁸ "Chen Yi's biography," University of Missouri-Kansas City, accessed Jan 24, 2018, <http://conservatory.umkc.edu/faculty.cfm?r=%22%2624%20%0A>.

throughout much of the piece and utilizes the interval of a seventh to interpret the sliding tone characteristic of a Chinese fiddle.⁵⁹

⁵⁹ Yi Chen “Jing Marimba for Solo Marimba,” program note, in *Intermediate Masterworks for Marimba*, ed. Nancy Zeltsman, vol. 2, (New York: C.F. Peter Corporation, 2009), 10.

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