

Educative Approach To The Functions Of The Thumb In Piano Playing

Ozgur Mert Esen

Anadolu University, Turkey

0282

The Asian Conference on Cultural Studies 2013

Official Conference Proceedings 2013



iafor

iafor
The International Academic Forum
www.iafor.org

INTRODUCTION

The professional pianists and the academics that have expertise on piano and piano education agreed that the fluent piano technique is essential for virtuosity and interpretation in piano playing. Undoubtedly, in the endless quest of the musical expression, a pianist has to develop and maintain a smooth technique in order to be free and to feel free to express his imagination musically. Throughout the history of piano education, wide range of researches has been made on the modality aspects of piano technique, concerning proper finger, hand, wrist, elbow, arm positions, and executing proper finger stroke based on those positions in scales, arpeggios, octaves and general piano playing. Although all those surveys searched for the answers to the same questions, investigated the same aspects and endeavored to predefine decisive positions and proper finger stroke for the evenness and the facility of the piano technique, they all brought out different conclusions and disagreed about many aspects on the subject. Obviously, ignoring the variety of the hand shapes and the uniqueness of their biomechanical structures was the main factor that caused the emergence of the multifarious conclusions of the researches. Because Most of those enquiries based on personal playing experience of the pianists and the piano teachers gained by long years of improving piano technique, and the specific hand shape of a pianist or a hand profile. However in spite of all the disagreed conclusions on the subject, most of the researches share a common opinion about the pivotal importance of the thumb in piano playing.

The thumb differs in function from the other digits. Its bones differ from the bones of the other digits in size and in the relation of the proximal phalanx to the carpus. It has two phalanges, eight muscles and represents fifty percent of the use and strength of the hand. It is important to understand that the conspicuous strength and the wide-angle motion ability of the thumb are only practical in our daily life. Because of its horizontal position on the keyboard and the touching part of the finger where it contacts to the key, it loses most of its strength and functions in piano playing. In other words, because of its demanded motion directions on the keyboard, thumb is the weakest finger of the hand in piano playing.

Richard McClanahan and Julien Musafia stated that thumb is the weakest finger in piano playing, because it must work on its side.¹ Ambrose Coviello and Sidney Harrison stated that the movement of the thumb in piano playing is uncomfortable. Caviello said that the movement of the thumb in piano playing, unlike the movement of the other fingers, is unnatural.² Mervyn Bruxner stated that the thumb is not much like a finger when playing the piano, since it is played in a different position.³ Jozef Gat suggested that the thumb is clumsy and slow, because its joint is less suited to velocity than those of the other fingers.⁴

¹ Richard McClanahan, "A Musical Approach to Piano Technic" April-May 1968, pp.31-32
Julien Musafia, "The Art of Fingering in Piano Playing" New York, MCA music, 1971 p.1

² Ambrose Coviello, "Foundations of Pianoforte Technique" London Oxford University Press 1934, p.69

Sidney Harrison, "Piano Technique" London Sir Isaac Pitman & Sons Ltd. 1953, p.6

³ Mervyn Bruxner, "Mastering the Piano" New York, St. Martin's Press, 1972, p.36

⁴ Jozef Gat, "The Technique of Piano Playing" London Collet's 1968, p.192

However there are also pianists who have stated that the thumb is the strongest finger in piano playing. Guy Maier called the thumb “stubby, strong, and proud.”⁵ Mary Wood Chase stated that the thumb is the most powerful finger and it needs less practice for the endurance than the other fingers.⁶

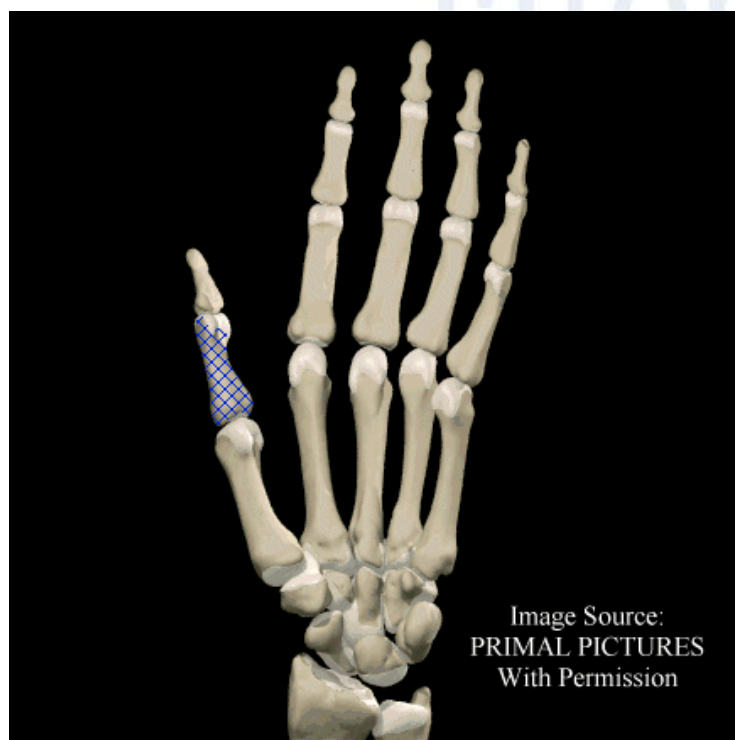
However MacClanahan solved the confusion about the strength of the thumb in piano playing. He stated that some people consider the thumb to be the strongest finger, because they use the thumb by their arm force. Julien Musfia stated that the thumb becomes the strongest finger when it is used as an extension of the forearm with the wrist. Joan Last said that the thumb is not strong by itself in piano playing. She stated that thumb joint nearest to the arm is almost a continuation of the wrist and can do little on its own. It has limited downward power. That is why it uses too much assistance from the forearm that makes it slow and heavy on the keyboard.⁷

In spite of all the disadvantages and difficulties of its utilization in piano playing, the thumb undertakes the most momentous responsibilities of the accurate playing in all the aspects of piano technique.

Biomechanical structure of the thumb and its natural functions

Thumb bones, joints, muscles and its functions differ from the other digits of the hand. It has two phalanges, rather than three. The two phalanges of the thumb are called “proximal and distal.”

Figure 1. “Proximal Phalanx” Primal Pictures 3D Human Anatomy Software



⁵ Guy Maier, “Adventures of a Piano Teacher” The Etude, 1952, p.58

⁶ Mary Wood Chase, “Natural Laws in Piano Technic” Boston, Oliver Ditson Co. 1910, p.16

⁷ Joan Last, “The Young Pianist” London, Oxford University Press, 1972, p.22

Figure 2. “*Distal Phalanx*” Primal Pictures 3D Human Anatomy Software



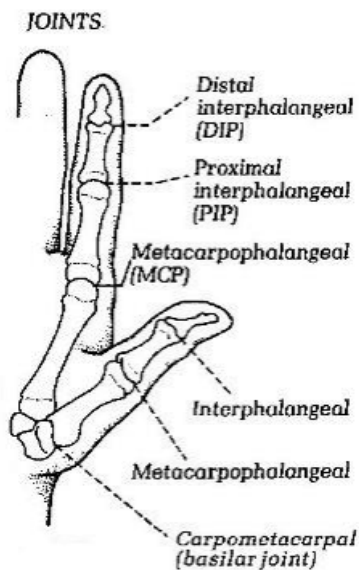
The metacarpal of the thumb is unique. It is the shortest metacarpal and has a broader shaft than the other metacarpals.

Figure 3. “*Metacarpal*” Primal Pictures 3D Human Anatomy Software



Joints

Figure 4. “Joints of the thumb” ASSH American Society for Surgery of the Hand



The carpometacarpal or basal joint of the thumb is located between the trapezium and the metacarpal. It is responsible for most of the rotation of the thumb. And in piano playing, it undertakes the most primary action of the thumb on the keyboard. This joint makes the thumb possible to move up and downward in natural hand position on the keyboard.

The metacarpophalangeal joint of the thumb is located between the metacarpal and the proximal phalanges. This joint has less mobility in flexion and extension than the same joint in the other fingers. Its main purpose is to stabilize the thumb in power grip. The metacarpophalangeal joint of the thumb, owing to horizontal position of the thumb on the keyboard, gives an exceptional privilege to the hand on the keyboard that none of the other fingers of the hand can provide. It mobilizes the hand to reach long distances on the keyboard.

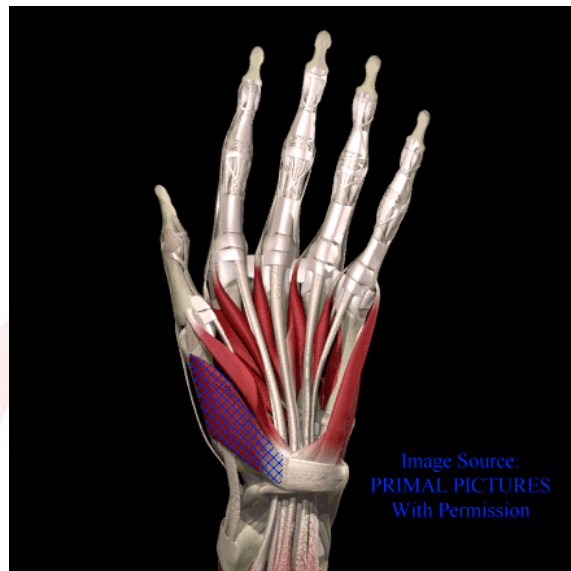
The interphalangeal joint of the thumb is located between the proximal and the distal phalanges. It is the least important of the three joints of the thumb and enhances the movement of the metacarpophalangeal joint. The only contribution of this joint to the thumb in piano technique is to help metacarpophalangeal joint to extend its movement to reach further keys during the thumb passing under the hand which I'm going to talk about the disadvantages and the drawbacks of its tilting in positioning and thumb passing under the hand.

Muscles

The thumb has eight muscles.

The Intrinsic Muscles are the opponens pollicis,

Figure 5. “*Oppenens Pollicis*” Primal Pictures 3D Human Anatomy Software



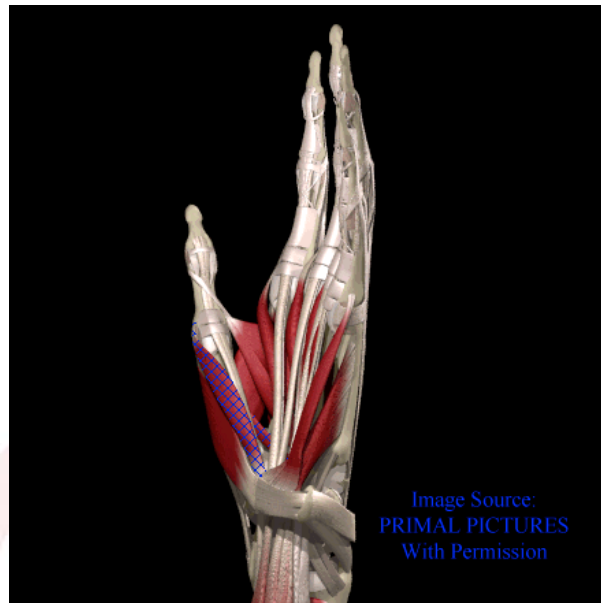
abductor pollicis brevis,

Figure 6. “*Abductor Pollicis Brevis*” Primal Pictures 3D Human Anatomy Software



flexor pollicis brevis

Figure 7. “*Flexor Pollicis Brevis*” Primal Pictures 3D Human Anatomy Software



and adductor pollicis.

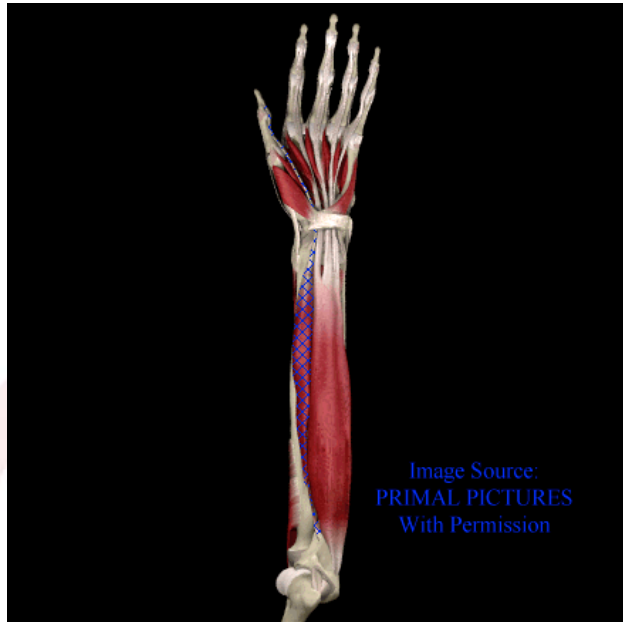
Figure 8. “*Adductor Pollicis*” Primal Pictures 3D Human Anatomy Software



These intrinsic muscles are substantially larger than those of the other fingers and have their origins in the wrist or hand.

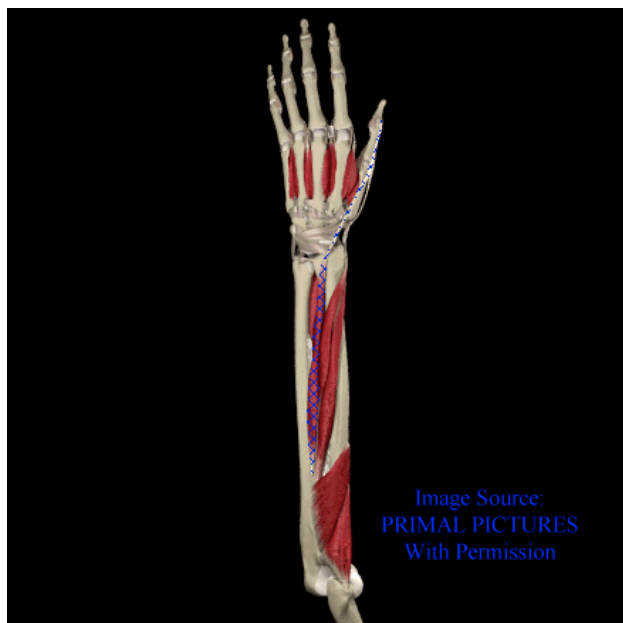
The Extrinsic Muscles of the thumb are the flexor pollicis longus,

Figure 9. “*Flexor Pollicis Longus*” Primal Pictures 3D Human Anatomy Software



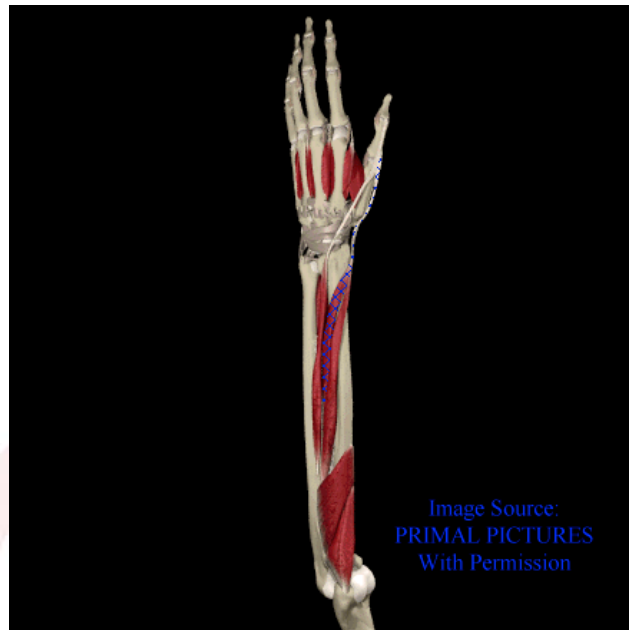
extensor pollicis longus,

Figure 10. “*Extensor Pollicis Longus*” Primal Pictures 3D Human Anatomy Software



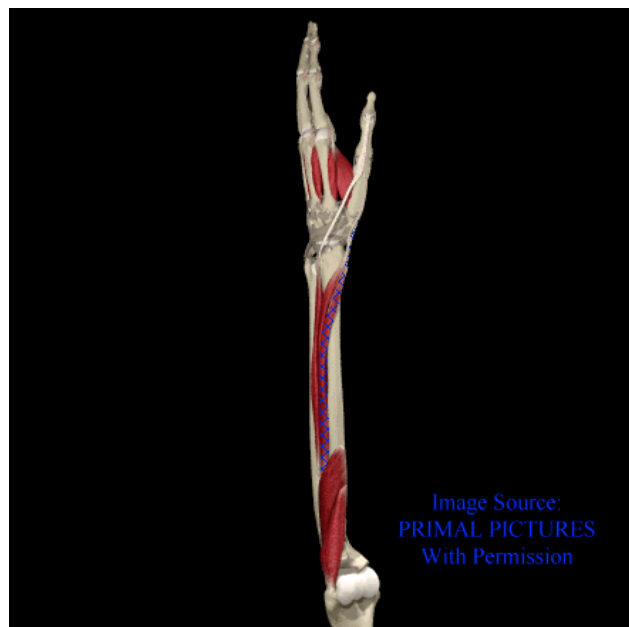
extensor pollicis brevis

Figure 11. “*Extensor Pollicis Brevis*” Primal Pictures 3D Human Anatomy Software



and the abductor pollicis longus.

Figure 12. “*Abductor Pollicis Longus*” Primal Pictures 3D Human Anatomy Software



The muscles of the thumb have some unique features. All of these muscles act only in groups and never as individual muscles. Also the intrinsic muscles have more force than the extrinsic muscles.

Thumb functions in piano playing.

Horizontal position of the thumb provides mobility to whole hand on the keyboard. But this position also causes many technical difficulties in general hand-position on the keyboard. Its up and downward motion is unnatural and weak. This movement may easily disturb the position of the whole hand also cause unwanted accents in the musical phrase. It is crucial to understand that the proper use of the thumb in piano playing depends on its up and downward movement to be executed as an independent movement, free from the arm weight and the forearm force. In other words, in piano playing, the thumb is expected to simulate the movements of the other digits of the hand, regardless of its horizontal position on the keyboard.

Figure 13. “*Proper vertical motion of the thumb*”

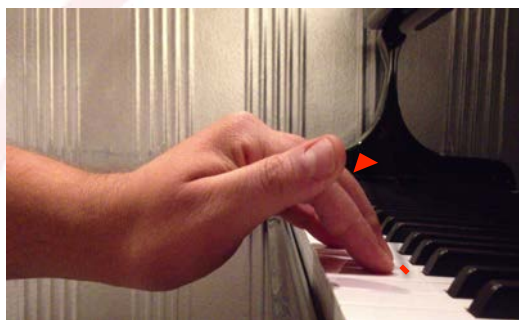
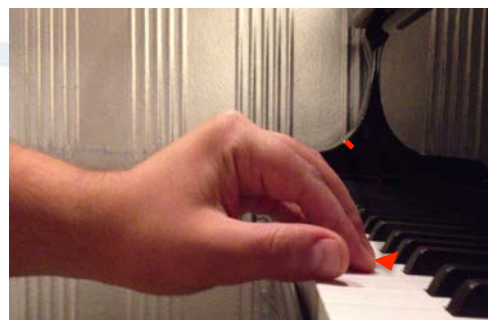


Figure 14. “*Proper vertical motion of the thumb*”



In order to develop this main function of the thumb in piano playing, the fundamental structure, and length of the thumb must be considered in specification of its position, stroke and attitude of the digit.

Proper position of the thumb based on its length,

The most stringent problem about the positioning of the thumb is the flexion movement of the interphalangeal joint. This wrong positioning causes unnecessary tension in the thumb, and blocks its vertical movement. Other four fingers of the hand need to flex in order to use their functions naturally in the technical mechanism of the general piano technique. This flexion of the other fingers is essential for proper positioning of the hand on the keyboard. However, when the other fingers of the hand flex, the thumb also wants to flex reflexively. But this flexure of the thumb is not useful in piano playing. In piano playing the thumb acts in an opposite way muscularly to the other fingers. Flexion from the interphalangeal joint stretches the flexor pollicis longus and obstructs the upward movement of the thumb. Stretching the flexor pollicis longus loosens the flexor pollicis brevis and causes too much loss of control in the downward movement of the thumb. This reflexive flexion of the interphalangeal joint of the thumb is also the most common and indiscriminable mistake that hinders most of the movements of the thumb in piano playing.

Figure 15. *“Proper position of the thumb”*

CORRECT

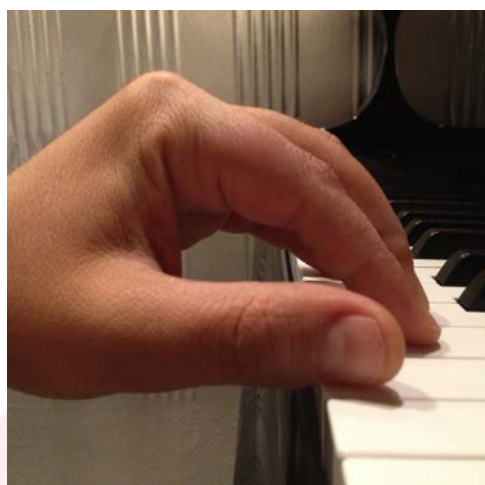


Figure 16. *“Improper position of the thumb”*

INCORRECT



The thumb must touch to the key with its tip and must be in a straight horizontal line with the fifth finger without bending its interphalangeal joint on the keyboard. This horizontal line and the touching part of the thumb may need some millimetric adjustments according to the length of the thumb.

Figure 17. *“Proper touch of the thumb to the keyboard”*

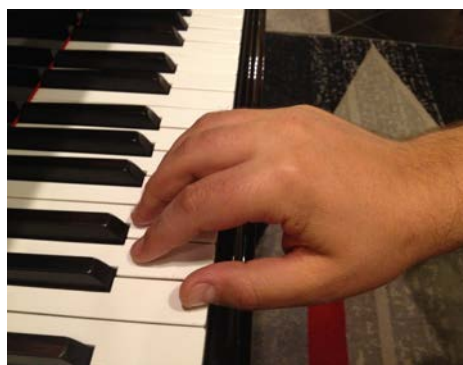


Figure 18. *“Horizontal line of the thumb with the fifth finger”*



These millimetric adjustments must be made by slightly twisting the hand position to the direction of the thumb if the thumb is long or by slightly twisting the hand position to the direction of the fifth finger if the thumb is short.

It is crucial to be aware of that the adjustments must never be provided by flexing the interphalangeal joint of the thumb during its positioning.

Proper movement attitude of the thumb

Because of its horizontal position on the keyboard the thumb is slow and heavy. In order to use it as lissome as the other fingers of the hand, it must leisurely and meticulously be trained to act like the other fingers of the hand. It must be freed from the arm and the wrist in order to learn acting as an independent finger.

The thumb should be trained to raise to the level of the other playing fingers, especially in the exercises. This motion would develop the involved muscles of the thumb to act independently as the other fingers. However lifting the thumb from the keyboard should be according to the demanded velocity of the thumb in the musical passage, and must never be lifted while it is not in use.

The thumb should always be relaxed and flexible, it should never feel strain and struggle in its functions on the keyboard. Inward curving of the interphalangeal joint of the thumb and over lifting from the keyboard, cause excessive tension in the thumb. This tension is the most trouble-making fact of the thumb in piano playing. It blocks the entire functions of the thumb and leads the arm and wrist-force to originate its movements. Most importantly, tension in the thumb and its downward motion provided by the arm and wrist force ruins the entire hand position and the natural movements of the other digits.

The movement of the thumb passing under the finger and the hand passing over the thumb, its ability to move inward to the hand and away from the hand is the most distinctive movements of the thumb in piano playing. But they are also the most critical and challenging movements of the thumb.

The unnatural and difficult downward motion of the thumb on the keyboard becomes even more difficult when it passes under the hand. Even though the movement starts with the natural flexing direction of the metacarpophalangeal joint, it has to end with the vertical downward motion of the thumb. Flexion movement from the metacarpophalangeal joint, that causes the contraction and congestion of the abductor pollicis, adductor pollicis and the flexor brevis, substantially blocks the downward movement of the thumb. Unfortunately, consequences of this movement are unavoidable because the facts are based on the fundamental biomechanics of the thumb.

Obviously the best solution of the problem would be to find a way to release and relax the contracted and congested muscles as fast as possible. In other words thumb should be trained to develop a relaxing attitude in all of its use in piano playing. The relaxation attitude can be developed easily if the wrist and forearm carry the weight of the hand during the thumb passing under the hand. Also the preparation timing and the velocity of the thumb based on its length can provide this relaxing attitude during the thumb passing under the hand.

Another reason that causes the tension in the thumb is to compel the thumb to carry the weight of the whole hand after the thumb passing under the hand. And it is pivotal to remember that the thumb carrying the hand weight right after the thumb passing and during the hand crossing over the thumb causes even more tension in the thumb. The thumb must never be considered as a leg of the hand as if it's responsible to carry the weight of the whole hand. Because, this misconfigured behavior of the thumb would render the all kind of relaxation attempts impossible.

New methodology for velocity and preparation timing of the thumb based on its length

Long thumb needs less velocity to prepare its next key, because it has shorter distance to travel under the hand. But short thumb needs more velocity to prepare its next key, because it has longer distance to travel under the hand, and the long distances lead the thumb to enforce its flexion movement even more when it is under the hand. Most of the pianists and the piano teachers deal with this problem by bending the interphalangeal joint of the thumb in order to shorten the distance of the passing way. But this causes even more tension in the thumb and blocks the entire movement of the digit. Instead of bending the last joint of the thumb, tilting the hand slightly to the fifth finger can shorten the distance and save the short thumbs from the over tension.

The best preparation timing of the thumb during the thumb passing under the hand starts right after pushing its first key then lifting it. Then it must proceed slowly under the second finger, right after the second finger stroke, before the third finger stroke, the tip of the thumb must reach to level where it's parallel to the third finger, and the most vital moment of the thumb passing under the hand occurs right here, during the third finger stroke. The third finger stroke and the thumb preparation on its next key must occur simultaneously. The tip of the thumb must be ready on its next key, at the same time with the third finger stroke. Velocity of this proper thumb passing movement should always be implemented and adjusted according to the swiftness of the scale, arpeggio, or the musical passage.

Clarified new methodology and the conclusion of the research.

The thumb undertakes the most vital responsibilities of the piano technique in spite of all its disadvantages in piano playing. That is why it needs special attention. In order to develop proper movement attitude for the thumb, following recommendations should be taken into consideration.

Because of its horizontal position on the keyboard,

- The thumb uses only one joint to accomplish its vertical motion that renders its primary movement possible. Non of the other joints of the thumb can help the carpometacarpal joint during this action, while the other fingers have two more joints to support their vertical motion. That is why the thumb is weaker than the other digits of the hand in piano playing.
- The thumb must be trained to move as agilely and swiftly as the other digits of the hand.
- The thumb must never be operated by the force of the wrist and arm in its actions on the keyboard. This behavior blocks all the functions of the thumb by deactivating the carpometacarpal joint, and ruins the entire hand position of the hand by shifting the motion angle of the other digits.
- Thumb can move vertically (upward-downward) and horizontally (inward-outward) on the keyboard, while the other fingers can move only vertically. But the vertical (primary) motion of the thumb is difficult and uncomfortable, because it causes tension in the thumb. And the horizontal (inward-outward) movements of the thumb increase the tension when the vertical motion and horizontal motion occur simultaneously. That is why relaxation attitude must be developed sensibly and thumb

must be trained to release the involved muscles rapidly. Unreasoned preparation timing and unrestrained velocity would make its relaxing attempt problematic.

-The thumb should never carry the weight of the hand during the thumb passing under the hand. This action would cause extensive tension in the thumb plus ruin the entire mechanism of piano technique.

In order to avoid incorrect utilizations and to develop proper use of the thumb in piano playing, following instructions must be implemented respectively and attentively.

-The thumb must touch to the key with its tip and must be in a straight horizontal line with the fifth finger on the keyboard. This horizontal line adjustments must never be provided by flexing the interphalangeal joint of the thumb during its positioning.

-The thumb must be operated from its carpometacarpal joint by the involved muscles. And it should be trained to raise to the level of the other playing fingers, especially in the exercises, in order to develop the involved muscles in its vertical movement. The arm and the wrist force must never operate the vertical movement of the thumb.

-The thumb must be light and relaxed in its movements. The wrist and the arm should carry the weight of the hand. The thumb should never carry the weight of the hand.

-Thumb stroke must be executed based on its length. Short thumb needs slight tilting, and more velocity in its preparation during the thumb passing under the hand. The interphalangeal joint of the thumb must never be bended during the thumb passing under the hand.

It is also important to remember that the proper use of the thumb is not fully enough to build a fluent piano technique. But the efficient and proper use of the thumb would certainly provide a strong contribution to the whole mechanism of a fluent piano technique. As Carl W. Grimm said “ The proper use of the thumb is the foundation of all good playing”⁸

And I strongly believe that the attentive implementing of the proposed methodology would develop the functions of the thumb in piano playing.

⁸ Grimm, Carl W. “Slighted Finger” The etude, March 1934, p.156

REFERENCES

- Bruxner, Mervyn. **“Mastering the Piano”** New York, St. Martin’s Press, 1972.
- Chase, Mary Wood. **“Natural Laws in Piano Technic”** Boston, Oliver Ditson Co., 1910.
- Coviello, Ambrose. **“Foundations of Pianoforte Technique”** London Oxford University Press 1934.
- Gat, Josef. **“The Technique of Piano Playing”** London Collet’s, 1968.
- Grimm, Carl W. **“Slighted Finger”** The etude, March 1934.
- Harrison, Sidney. **“Piano Technique”** London Sir Isaac Pitman & Sons Ltd. 1953.
- Last, Joan **“The Young Pianist”** London, Oxford University Press, 1972.
- Lee, SH. **“Hand biomechanics in skilled pianists playing a scale in thirds.”** University of South Florida, December 2010.
- McClanahan, Richard. **“A Musical Approach to Piano Technic”** April-May 1968.
- McRoberts, Terry Allan **“The Use of the Thumb in Piano Playing”** Ball State University, June, 1984.
- Musafia, Julien. **“The Art of Fingering in Piano Playing”** New York, MCA music, 1971.
- Maier, Guy. **“Adventures of a Piano Teacher”** The Etude, 1952.
- Şen, Seba Baştuğ. **“Piyano Tekniğinin Biyomekanik Temeli”** 3. Basım, Istanbul, 2009.

