

# Help! My Fourth Finger Feels Weak

## Understanding Finger Independence



Benjamin Steinhardt, presenter  
[www.BenjaminSteinhardt.com](http://www.BenjaminSteinhardt.com)

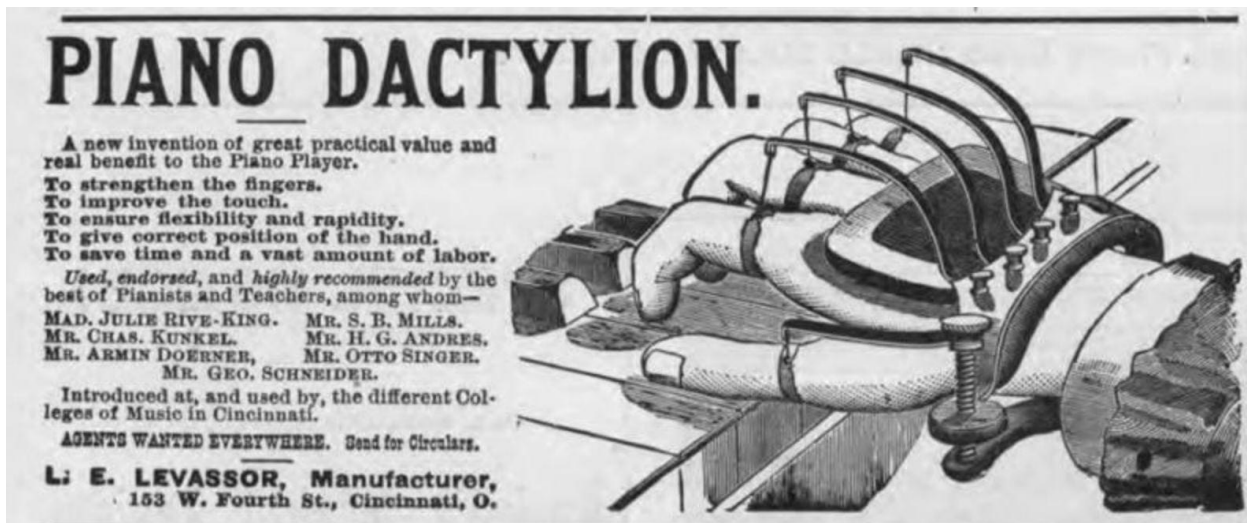
Music Teachers National Association  
Monthly Webinar  
Friday, July 17th 2020

# A Brief History

*1700 to the present*

## Finger Strengthening Devices

- Dactylion (1836) invented by Henri Herz
- Chirogymnast (1840) invented by Casimir Martin
- Guide-Mains (handguards) invented by F. W. M. Kalkbrenner
- Chiroplast invented by Johann Bernhard Logier
- L'Appareil Destine..... (1846) invented by M. F. d'Urcle
- Metromano- Piano (1897) invented by Luigi Pizzamiglio

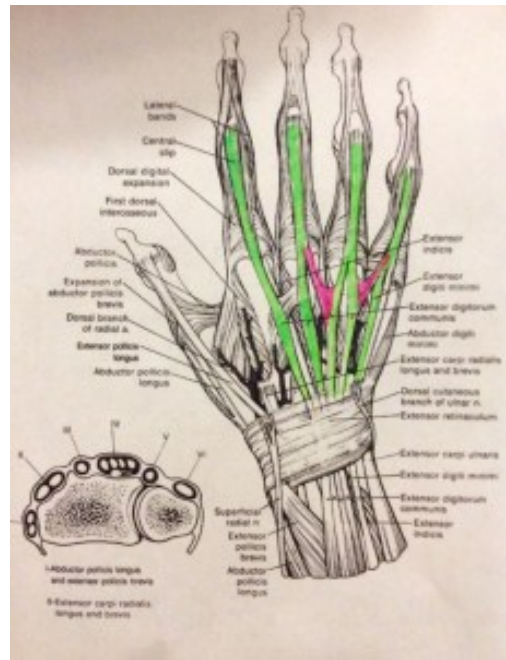


## Etudes and Exercises

- Etudes:** Carl Czerny (1791-1857), Johann Baptist Cramer (1771-1858), Johann Nepomuk Hummel (1778-1858), Ignaz Moscheles (1794-1858)
- Exercises:** Charles-Louis Hanon (1819-1900) Friedrich Wieck (1832-1916) Carl Schröder (1848-1935), Edmund Neupert (1842-1888), Bruno Zwintscher (1838-1905) Alberto Jonás (1868-1943), Oscar Beringer (1844-1922)
- “Finger Independence” Exercises:** Isidor Philipp (1863-1958) Ernst von Dohnányi (1877-1960), Franz Liszt (1811-1886), Jean Roger-Ducasse (1873-1954), Josef Pišna (1826-1896)

# Anatomy and Biomechanics

*A hopefully painless guide*



## Glossary:

**Agonist and Antagonist Muscle Pairs-** as one muscle contracts the other muscle relaxes or lengthens. The muscle that is contracting is called the **agonist** and the muscle that is relaxing or lengthening is called the **antagonist**.

**Tendon-** a tough band of fibrous connective tissue that connects muscle to bone and is capable of withstanding tension.

**Flexor digitorum profundus-** a muscle in the forearm that flexes the fingers. It is considered an extrinsic hand muscle because it acts on the hand while its muscle belly is located in the forearm.

**Extensor digitorum-** is a muscle of the posterior forearms. It extends the medial four digits of the hand.

**Extensor digiti minimi**- a long, thin muscle found in the posterior forearm. It extends from the distal humerus to the fifth finger

**Lumbricals**- intrinsic muscles of the hand that flex the metacarpophalangeal joints and extend the interphalangeal joints.



## “Finger Strength”

**Grip strength**- the force applied by the hand to pull on or suspend from objects

### **Mountain Climbing:**

High Force - up to 80 pounds per square inch

Slow Movement- holds for up to 40 seconds

### **Piano Playing:**

Low force- 55-75 grams for a single key

Fast Movement- up to 20 keystrokes per second

### **Power Grip:**

holding posture using the palm as a buttress

### **Precision Grip:**

any combination of thumb in opposition to fingers

# The Brain

## *Maps and Architecture*



Benefits of musical training:

- a. Anatomically enhanced motor pathways
- b. Increased volume and grey matter in the cerebellum
- c. Greater emotional intelligence
- d. Better performance on cognitive tasks
- e. Greater openness to experiences
- f. Larger cortical representations of the fingers

-Playing a musical instrument is a complex sensorimotor activity that simultaneously engages multiple brain regions

-The age of training is important. Musicians who begin training early have significantly larger corpus callosums and “early optimized networks”

-the association of motor actions with specific sound and musical notation strengthens connections between auditory and motor regions of the brain

# Tips for Building the Musical Brain

*Hommage à Anat Baniel*

1. Make Comparatives (Same vs. Different)
2. Develop Attention and Awareness
3. Use Gentle Touch
4. Go Slow
5. Create Variations
6. Apply Subtlety Rather Than Force
7. Maintain flexible goals
8. Combine movement with Sound
9. Combine Sound with Emotions
10. Sing and Move

# Tips for Coordinating the Body

*Hommage à Dorothy Taubman and Teresa Dybvig*

1. Embrace Unification, Avoid Isolation
2. Stay within the Mid-Range of Motion
3. Avoid Awkward Movements
4. Stay Within Your Natural Alignment
5. Keep The Hand Toned
6. Remain In Balance
7. Utilize the “Proximal To Distal Gradient”
8. Work With The Instrument
9. Minimal Effort for Maximum Effect
10. Minimize Motion Through Cooperation

# Musical Examples

## Burgmuller "L'Arabesque" Op. 100 n. 2

Musical score for Burgmuller's "L'Arabesque" Op. 100 n. 2. The score is in G major and 3/4 time. It features a first ending with a first ending repeat sign and a second ending. The first ending is marked with a first ending repeat sign and a first ending bracket. The second ending is marked with a second ending repeat sign and a second ending bracket. The score includes dynamic markings such as *sf* and *f*, and a performance instruction *dimin. e poco rall.* in the second system. The piece is characterized by its intricate fingerings and flowing melodic lines.

## Beethoven "Für Elise" WoO 59

Musical score for Beethoven's "Für Elise" WoO 59. The score is in C minor and 3/4 time. It features a first ending with a first ending repeat sign and a second ending. The first ending is marked with a first ending repeat sign and a first ending bracket. The second ending is marked with a second ending repeat sign and a second ending bracket. The score includes dynamic markings such as *pp* and *p*, and a performance instruction *pp* at the beginning. The piece is characterized by its simple yet expressive melody and rhythmic accompaniment.

## Schumann "Knecht Ruprecht Op. 68 n. 12

Musical score for Schumann's "Knecht Ruprecht" Op. 68 n. 12. The score is in G major and 3/4 time. It features a first ending with a first ending repeat sign and a second ending. The first ending is marked with a first ending repeat sign and a first ending bracket. The second ending is marked with a second ending repeat sign and a second ending bracket. The score includes dynamic markings such as *p* and *f*, and a performance instruction *p* at the beginning. The piece is characterized by its rhythmic complexity and intricate fingerings.



### Chopin Ballade n. 4 Op. 52

Musical score for Chopin Ballade n. 4 Op. 52, measures 233-235. The score is in B-flat major and 3/4 time. It features a complex melodic line in the right hand with many slurs and fingerings (e.g., 8, 4, 5, 4, 1, 2, 4). The left hand has a steady accompaniment with slurs and fingerings (e.g., 1, 1, 1, 1). Pedal markings (Ped.) and asterisks (\*) are present throughout the passage.

### Beethoven Sonata Op. 2 n. 3

Musical score for Beethoven Sonata Op. 2 n. 3, measures 3-9. The tempo is marked "Allegro con brio". The score is in C major and 3/4 time. It features a rhythmic accompaniment in the left hand and a melodic line in the right hand. Dynamics include piano (*p*) and fortissimo (*sf*). Pedal markings (Ped.) and asterisks (\*) are present.

### Chopin Ballade n. 1 Op. 23

Musical score for Chopin Ballade n. 1 Op. 23, measures 53-60. The score is in B-flat major and 3/4 time. It features a melodic line in the right hand with slurs and fingerings (e.g., 5, 2, 3, 1, 5, 3, 5, 4). The left hand has a steady accompaniment with slurs and fingerings (e.g., 5, 3, 2, 2). The dynamic is marked "dimin.". Pedal markings (Ped.) and asterisks (\*) are present throughout the passage.

# Schumann "Vogel Als Prophet" Op. 82 n. 7

Langsam, sehr zart. ♩ = 63.

7. *pp*

*Ped.* \*

*Ped.* \*

*Ped.* \*

# Chopin Ballade n. 4 Op. 52

223 *ff*

*Ped.* \*

# Schubert Impromptu in G flat D. 899

## III.

Andante.

pp

p

# Beethoven Sonata op. 28

264

105

110

115

120

125

f

p

cresc.

# Reading and Resources

## **The Body:**

- “The Hand: How Its Use Shapes the Brain, Language, and Human Culture”  
Frank R. Wilson
- “Hands” John Napier

## **The Brain:**

- “Music, Neurology, and Neuroscience” Altenmuller, Boller, & Finger
- “Music, Motor Control, and the Brain” Altenmüller, Kesselring, & Wiesendanger
- “This Is Your Brain On Music” Daniel J. Levitin
- “Musicophilia: Tales of Music and the Brain” Oliver Sacks

## **Learning:**

“Make It Stick: The Science of Successful Learning” Brown, Roediger III, McDaniel”

## **Technique:**

“Virtuosity in a Box” DVD Taubman & Golandsky  
“Freeing the Caged Bird” DVD Barbara Lister-Sink  
“What Every Pianist Needs to Know About the Body” Thomas Mark  
“Adaptive Strategies for Small-handed Pianists” Deahl and Wristen

## **Websites:**

[www.wellbalancedpianist.com](http://www.wellbalancedpianist.com) - Taubman Approach and Body Work

[www.anatbanielmethod.com](http://www.anatbanielmethod.com) - Feldenkrais and Anat Baniel Method

[www.feldenkrais.com](http://www.feldenkrais.com) - Feldenkrais Method

[www.golandskyinstitute.org](http://www.golandskyinstitute.org) - Taubman Approach

[www.sheilapaige.com](http://www.sheilapaige.com) - Taubman Approach and Body Work

[www.alexandertechnique.com](http://www.alexandertechnique.com) - Alexander Technique

[www.alexanderworkshops.com](http://www.alexanderworkshops.com) - Alexander Technique and Body Mapping