Help! My Fourth Finger Feels Weak

Understanding Finger Independence

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Music Teachers National Association
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A Brief History

1700 to the present

Finger Strengthening Devices

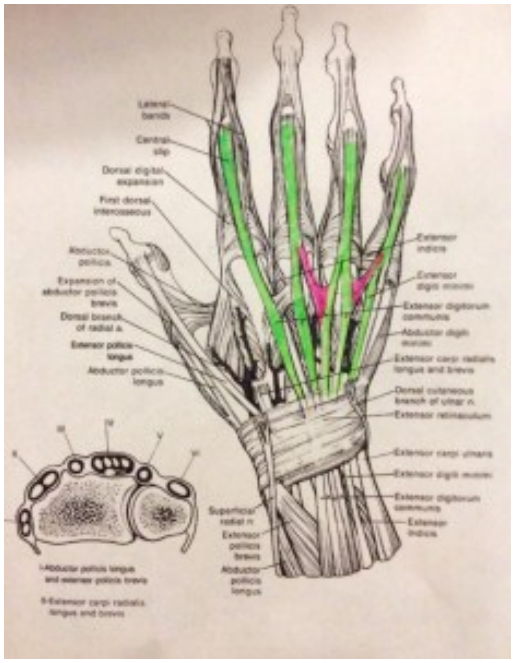
-Dactylion (1836) invented by Henri Herz
-Chirogymnast (1840) invented by Casimir Martin
-Guide-Mains (handguards) invented by F. W. M. Kalkbrenner
-Chiroplast invented by Johann Bernhard Logier
-L'Appareil Destine….. (1846) invented by M. F. d'Urcle
-Metromano- Piano (1897) invented by Luigi Pizzamiglio

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

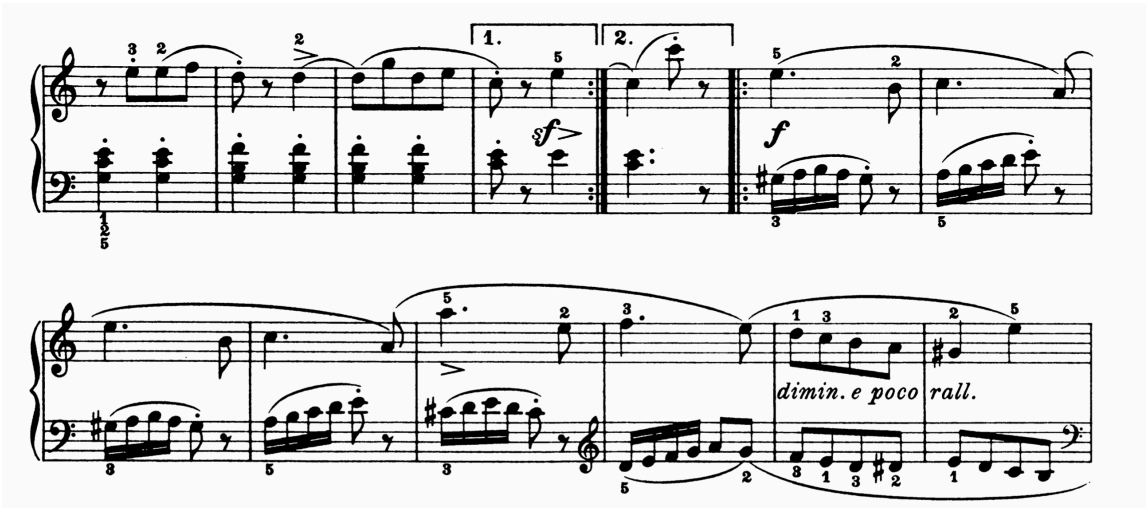
Tips for Coordinating the Body

Hommage à Dorothy Taubman and Teresa Dybvig

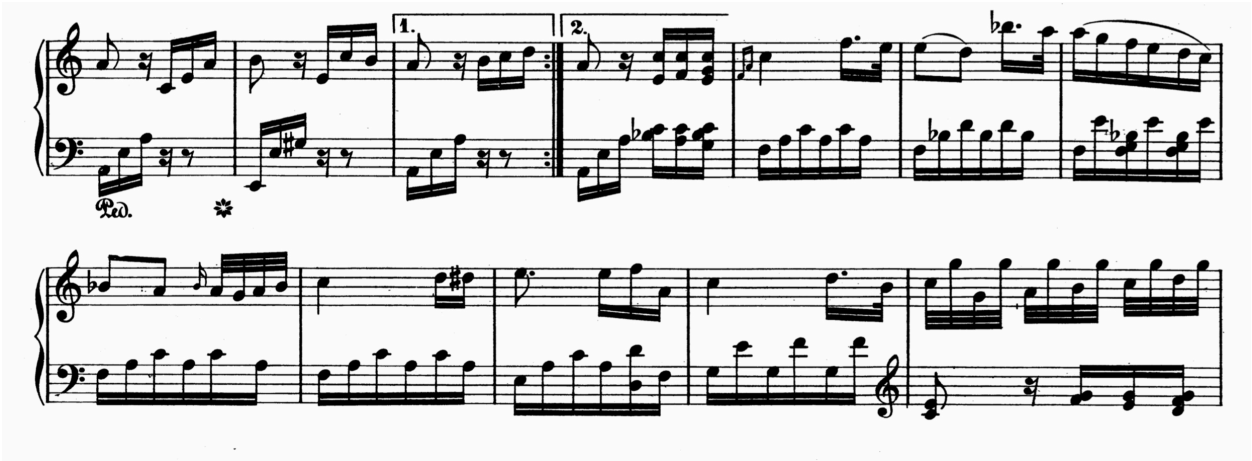
1. Embrace Unification, Avoid Isolation
2. Stay within the Mid-Range of Motion
3. Avoid Awkward Movements
4. Stay Within Your Natural Alignment
5. Keep The Hand Toned
6. Remain In Balance
7. Utilize the "Proximal To Distal Gradient"
8. Work With The Instrument
9. Minimal Effort for Maximum Effect
10.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

Musical Examples

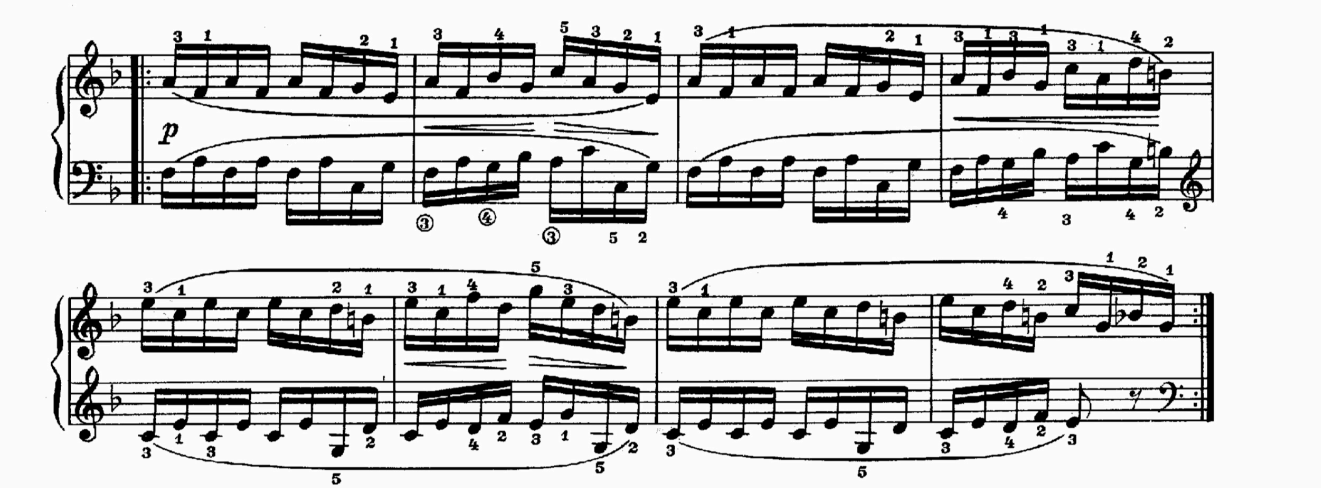
Burgmuller "L'Arabesque" Op. 100 n. 2



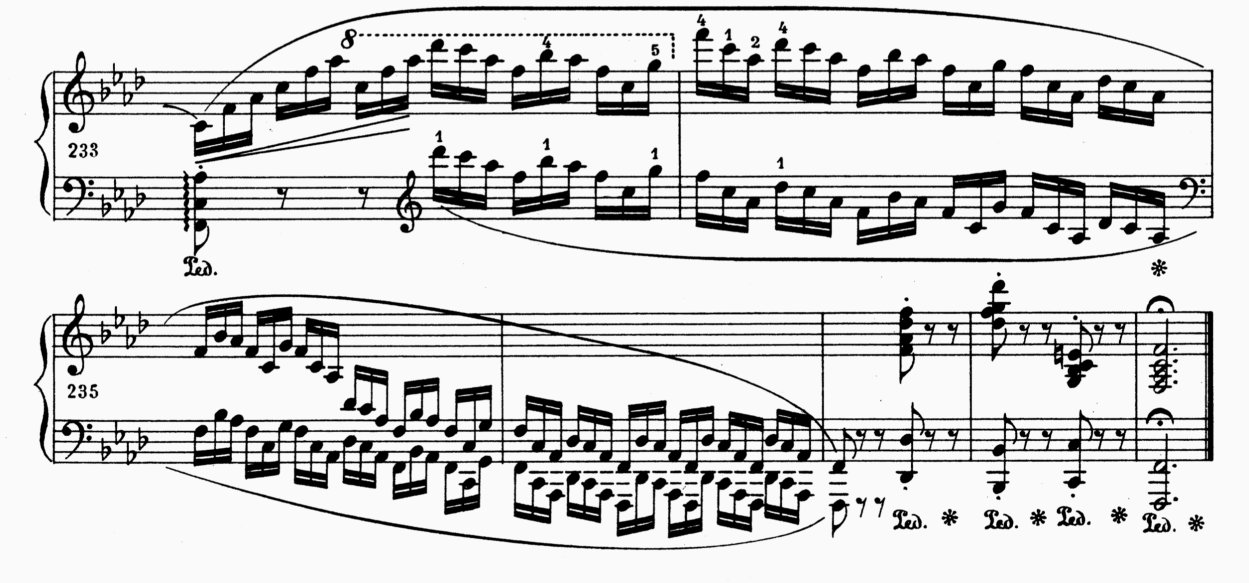
Beethoven "Fur Elise" WoO 59



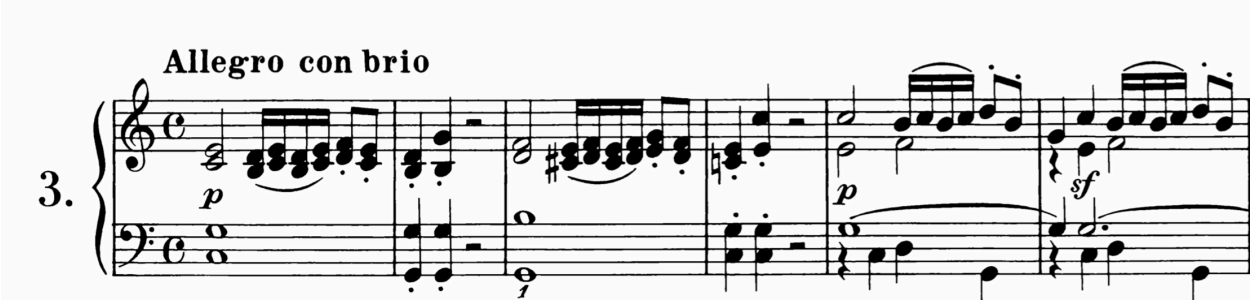
Schumann "Knecht Ruprecht Op. 68 n. 12



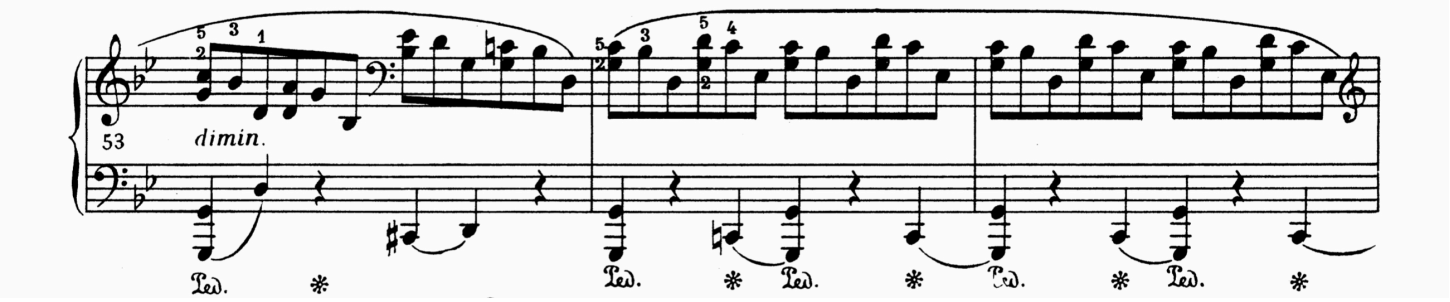
Chopin Ballade n. 4 Op. 52



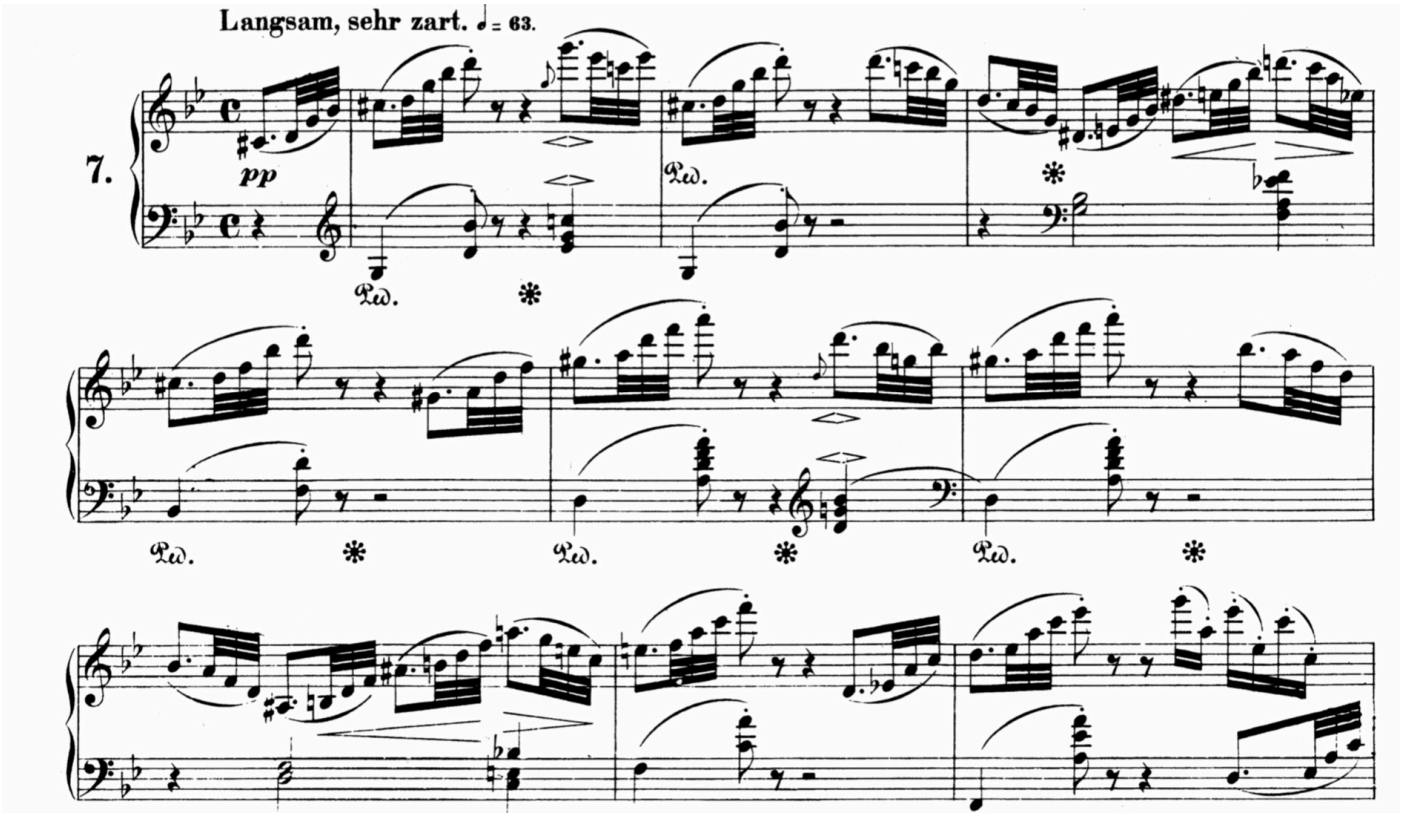
Beethoven Sonata Op. 2 n. 3



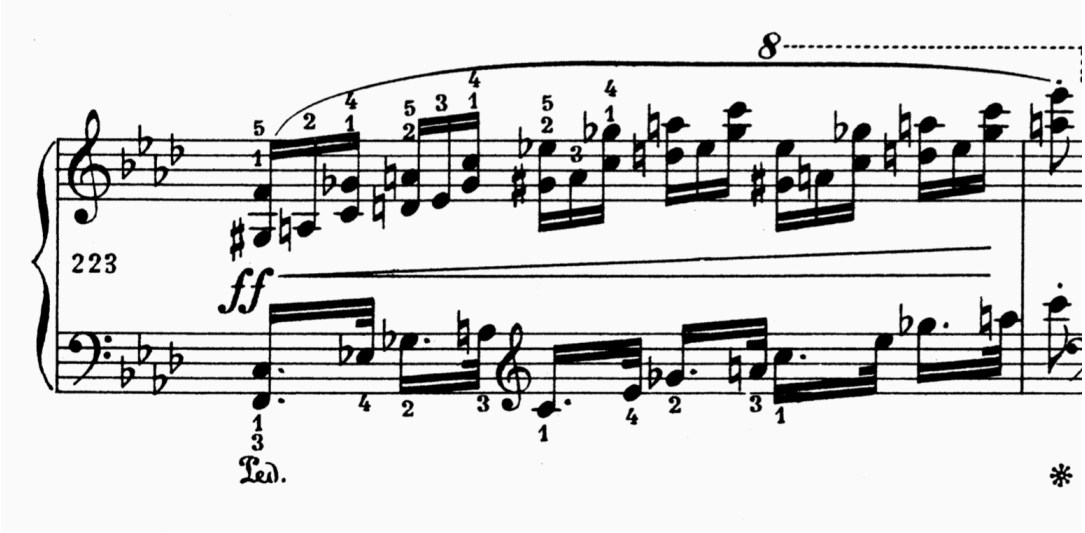
Chopin Ballade n. 1 Op. 23



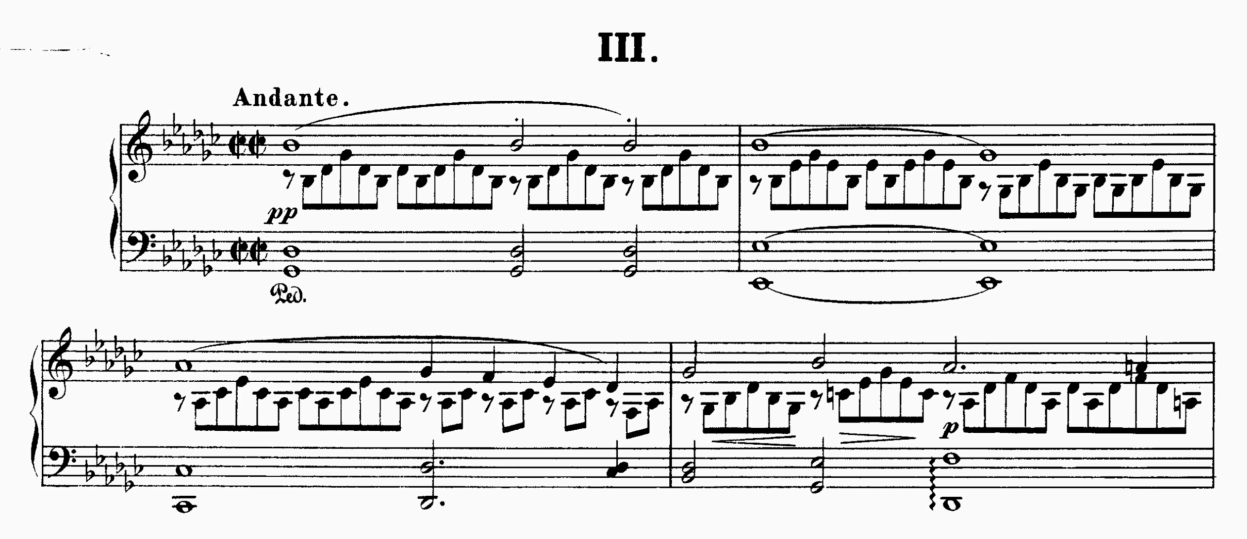
Schumann “Vogel Als Prophet” Op. 82 n. 7



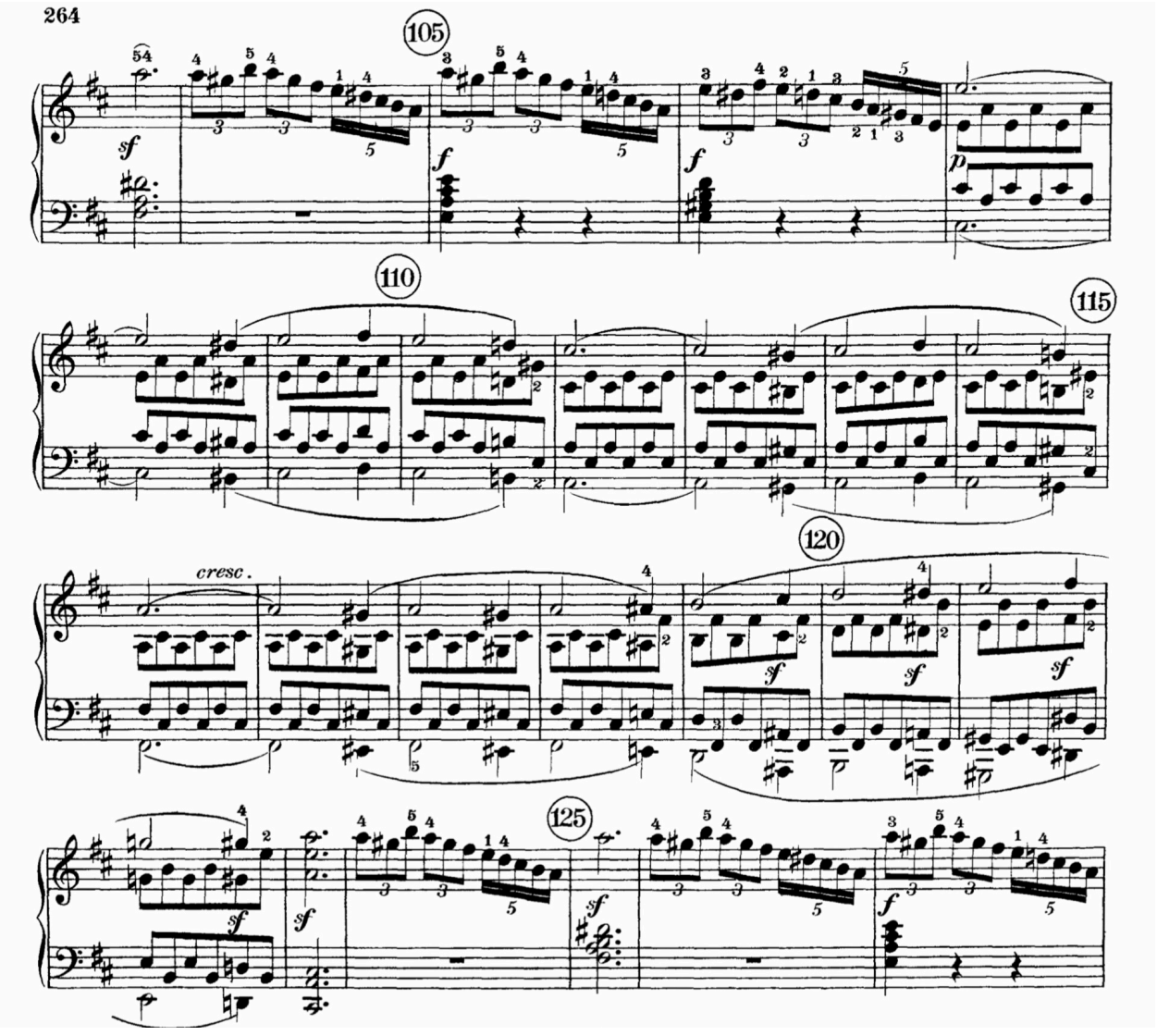
Chopin Ballade n. 4 Op. 52



Schubert Impromptu in G flat D. 899



Beethoven Sonata op. 28



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 You 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 - Taubman Approach and Body Work

www.anatbanielmethod.com - Feldenkrais and Anat Baniel Method

www.feldenkrais.com - Feldenkrais Method

www.golandskyinstitute.org - Taubman Approach

www.sheilapaige.com - Taubman Approach and Body Work

www.alexandertechnique.com - Alexander Technique

www.alexanderworkshops.com - Alexander Technique and Body Mapping