

Evolution of One-Handed Piano Compositions

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Electronic searches were performed to investigate the evolution of one-handed piano compositions and one-handed music techniques, and to identify individuals responsible for the development of music meant for playing with one hand. Particularly, composers such as Liszt, Ravel, Scriabin, and Prokofiev established a new model in music by writing works to meet the demands of a variety of pianist-amputees that included Count Géza Zichy (1849–1924), Paul Wittgenstein (1887–1961), and Siegfried Rapp (b. 1915). Zichy was the first to amplify the scope of the repertoire to improve the variety of one-handed music; Wittgenstein developed and adapted specific and novel performance techniques to accommodate one-handedness; and Rapp sought to promote the stature of one-handed pianists among a musically sophisticated public able to appreciate the nuances of such maestros. (*J Hand Surg* 2008;33A:780–786. Copyright © 2008 by the American Society for Surgery of the Hand. All rights reserved.)

Key words Amputation, hand, history of surgery, music, piano.

MUCH HAS BEEN WRITTEN ABOUT the creativity of composers and the skills of musicians, and special emphases have been placed on the mind and the vagaries of neurosis and even madness in the process of composition. Little consideration has been given to physical defects and their influence on both music and its interpretation. In this article, we examine the evolution of music for one hand in response to amputation and injury sustained by musicians.

Unfortunate traumatic events such as hand amputations pose severe limitations on the scope, availability, or opportunity to play and interpret music. Under such circumstances, artistically inclined individuals may justifiably be considered to suffer from a medical condition that severely limits creative growth. In an attempt to evaluate this and explore those afflicted, we examined some examples of hand loss and its impact on musical creativity, music literature, performance techniques, dexterity, and artistic spirit. Specifically, we investigated the evolution of music for one hand.

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EVOLUTION OF THE PIANO: OF FINGERS AND KEYS

Pianists are graced with a rich and remarkable history of their instrument, which encompasses more than 850 years of development and evolution.¹ From the keyed monochord in 1157, to the clavichord (late Medieval), to the harpsichord (1440), musicians yearned for a rich and full sound that would fill the courts of European monarchs. Development of such an instrument emerged in the early 1700s in Padua, Italy, where Bartolomeo Cristofori (1655–1731) designed the first precursor of a modern piano.¹ Fitted with thin strings and seemingly quiet when compared with the modern version of a piano, Cristofori's instruments possessed a power and richness surpassing any clavichord of the era. With the advent of the Industrial Revolution, pianos grew in size, increased in tonal range from 5 to 7 octaves, and were modified with mechanical innovations such as the damper (also known as sustaining) pedal, soft pedal, and sostenuto pedal to extract sound of various colors and shades.¹ In particular, their popularity increased among the ranks of renowned composers such as J. S. Bach (1685–1750), who served as an agent in selling Silbermann's pianos. These instruments were unique products of the creative labors of Gottfried Silbermann (1683–1753) who pioneered the damper pedal, an advance that ensured the survival of music for the left hand by facilitating the masking of the "jumps" of the

TABLE 1. Selected Works for the Piano and Left Hand Alone

Composer	Work	Published
Czerny, Carl (1791–1857)	<i>Two Studies for the Left Hand Alone</i> , Op. 735	Vienna: Mechitt, 1846. Amsterdam: Heuwekemejer, c. 1969
Godowsky, Leopold (1870–1938)	<i>Elegy</i> . B minor; moderato	New York: G. Schirmer, 1931. 4 pp. Dedicated to Gottfried Galston and Emile R. Blanchet
Saint-Saens, Camille (1835–1921)	<i>Six etudes pour la main gauche seule</i> , Op. 135. 1. <i>Prelude</i> ; 2. <i>Alla Fuga</i> ; 3. <i>Moto Perpetuo</i> ; 4. <i>Bouree</i> ; 5. <i>Elegie</i> ; 6. <i>Gigue</i>	Paris: Durand & Cie., c. 1912
Scriabin, Alexander (1872–1915)	<i>Prelude</i> , Op. 9 no. 1, and <i>Nocturne</i> , Op. 9 no. 2	Leipzig: M. P. Belaieff, 1895. 2 pp.
Strauss, Richard (1864–1949)	<i>Panathenzug: Sinfonische Etuden in Form einer Passacaglia für Klavier (linke Hand) und Orchester</i> , Op. 74	London: Boosey & Hawkes, c. 1953. Score is 168 pp.
Wittgenstein, Paul (1887–1961)	<i>School for the Left Hand</i> (3 volumes)	Vienna and London: Universal Edition, 1957
Zichy, Count Vasony-Keo Geza (1849–1924)	<i>Sonate für Pianoforte für die linke Hand allein</i>	Hamburg: D. Rahter, c. 1887. 15 pp.

hand associated with a broad acoustical range of melodies. W. A. Mozart (1756–1791) made the piano an instrument of choice when composing concertos and sonatas, and L. van Beethoven (1770–1827) and F. J. Haydn (1732–1809), were the first to use *Broadwood* firm pianos (the oldest piano company in the world [1728]) with a range of more than 5 octaves for their works.²

Despite the concurrent evolution of string and wind instruments, the piano remained an instrument of choice among many of the European aristocracy who sought to associate their leisure time with the elegance of music. This display of popularity is largely attributed to accessibility and appeal, and indeed the piano has continued to hold its position as a versatile instrument among the populace. Unlike string instruments, the piano does not pose unassailable mechanical restrictions on musicians with disabilities, particularly those who have had amputation. Any musical composition can be written for one or more hands, too many or too few fingers, or any combination of the above. The only limitations are those placed by composers demanding unique techniques.

EVOLUTION OF MUSIC FOR THE ONE HAND

The piano was devised as a musical instrument for a two-handed player with special emphasis devoted to the right hand, which has always been regarded as the dominant or “correct” hand. Throughout history, right-handedness has been considered normal (the Latin

word *dexter* [“right”] is associated with skill, whereas *sinister* [“left”] is synonymous with wickedness). Given the propensity of the church and schools to insist that persons use the right hand, damage to it was more likely than the left. Thus in the 19th century, virtually everyone was right-handed, and those who at an early age manifested a tendency to left-hand usage were strenuously encouraged to conform.³ As a consequence of exposure, the right hand was thus more prone to injury through everyday usage, work-related accidents, or military trauma. In particular, the frequency and widespread carnage of warfare of the times, including the Napoleonic Wars (1803–1815), American Civil War (1861–1865), and World War I (1914–1918) contributed considerably to the likelihood of limb or digital depredations. Given the surgical recognition of the need for early amputation to save life (obviate damaged tissue and sepsis), loss of limbs and, in this instance, hands was a widespread phenomenon as an aftermath of military injury.⁴ Those with body cavity injuries almost all perished, but survivors of bullet-, cannon-, or sword-inflicted injuries were invariably amputees of one sort or another. Arm amputations were a ubiquitous phenomenon in the towns and cities of both Europe and America, and in the 19th century, trauma was the cause of one third of all major limb amputations with a mortality rate of approximately 22%.⁴ A study of amputations at the Royal Berkshire Hospital (Reading, England) noted that trauma was the leading cause of amputation (58%) and that 81% of arm amputations



FIGURE 1: An example of contrapuntal/homophonic music provided in an excerpt of the *Nocturne in D-flat Major*, Op. 9 No. 2, composed by Alexander Scriabin (1872–1915; inset). The piece is performed entirely by the left hand with jumps artfully masked by a slight damper pedal.

were a consequence of trauma, whereas 76% of leg amputations were for disease.⁵ Thus, to a large extent, piano music for one hand is a legacy of military and surgical practice during the 19th century, and the predominant pianistic dedication to the left hand (80%) reflects the long-standing social prejudice proclaiming usage of the right hand as a societal norm.⁶

Raymond Lewenthal's (1926–1988) anthology, *Piano Music for One Hand; a Collection of Studies, Exercises, and Pieces*,⁷ lists one of the earliest known examples of piano music for one hand: C. P. E. Bach's (1714–1788) *Klavierstück in A Major*, also called *Solfeggio*. The score was composed sometime before 1770, is brief in structure (only 32 measures in length), and can be played using either hand alone. Its versatility suggests that it was composed for exercise and demonstration. Piano music specifically written for the left hand first appeared in 1840, when Friedrich Kalkbrenner (1785–1849) composed the *Four-Voiced Fugue*.⁷ Thereafter, this novel approach attained some degree of "popularity," and one-handed literature began to develop and attract some of the mainstream composers of the 19th and early 20th centuries. Thus, late Romantic and early modern composers such as Carl Czerny (1791–1857), Franz Liszt (1811–1886), Camille Saint-Saens (1835–1921), Leopold Godowski (1870–1938), Alexander Scriabin (1872–1915), and Maurice Ravel (1875–1937) turned their attention to this area. Selected piano works for the left hand are listed in Table 1.

THE NATURE OF ONE-HANDED MUSIC

Musical literature for one hand can be subdivided into 2 major types: monophonic and contrapuntal/homophonic.⁶ The former pieces are dominated by single-note passages and bass is implied rather than highlighted,

whereas in contrapuntal/homophonic literature, music is written in a fashion to provide an illusion of both hands playing simultaneously. Thus in the contrapuntal style, one hand is occupied by playing bass accompaniment as well as the melody, and special emphasis is provided by use of a damper pedal to mask the gaps created by occasional jumps along the keyboard. In this scenario, the challenge of the pianist is to clearly separate every element dynamically, otherwise the melody becomes lost in a brutal accompaniment. On the contrary, in right-handed literature, such a goal is much easier to attain because fingers used to carry out a melody are much more prone to delicate playing (fourth and fifth fingers). A left-handed pianist must however exercise more substantial control of the thumb because, like its right counterpart, it exhibits a tendency to produce a rough and nonmelodic sound by transmitting 12 times more force from the end phalange to the carpometacarpal joint.⁸ This mechanical disadvantage can be downmodulated by rigorous repetitive exercises and training focused on producing a more aesthetically appealing sound quality. An excerpt from Scriabin's *Nocturne in D-flat Major*, Op. 9 No. 2, is a good example of a contrapuntal/homophonic piece (Fig. 1). The piece is performed entirely by the left hand with jumps artfully masked by a slight damper pedal. The relatively difficult arpeggios and stretches are achieved by a relaxed and flexible wrist angled in such a way as to give the fifth finger extra support and ensure extra reach and sensitivity of the left thumb.

Trauma or surgical amputation, though commonly associated with damage to the hand, was not the only cause of failure to be able to play with both hands. The earliest published work initiated by disability of the right hand was provided in 1820 by *Studies*, Op. 12,



FIGURE 2: Key players in the evolution of piano music for the left hand. **A** Count Géza Zichy (1849–1924), Hungarian pianist and composer, lost his right arm in a hunting accident. Zichy achieved the feat of becoming the first one-handed pianist-virtuoso through hard work and dedication. **B** Paul Wittgenstein (1887–1961), scion of the famous Viennese family, lost his right hand in World War I, and thereafter by dint of fortitude, talent, and influence was instrumental in the development of piano literature for the left hand. **C** Maurice Ravel (1875–1937), the French composer of the Impressionistic period. His *Piano Concerto in D Major for the Left Hand* is still regarded as among the finest examples of literature for left-hand piano. **D** Sergei Prokofiev (1891–1953), a Russian Muscovite widely considered as one of the finest exponents of composition of the 20th century. His *Piano Concerto No. 4*, originally written for Paul Wittgenstein, was unappreciated for decades until Siegfried Rapp's inspirational one-handed interpretation of the opus.

composed by Ludwig Berger (1777–1839)³ in an attempt to minimize the deleterious effects of an apoplectic stroke (cerebral infarct) that paralyzed his right hand. Berger, an accomplished piano instructor and member of the faculty of both the St. Petersburg and Berlin Conservatories, is considered to have been the inspiration behind the famed *Songs Without Words* of his pupil F. Mendelssohn (1809–1847).³ Scriabin provided the second example by overpracticing his right arm to the extent that he developed such severe tendonitis he became unable to play. Such was his obsession with the lesion that he continually stared at the offending hand and relentlessly tapped it on the table top during conversation. After 2 years of frustration, he composed the *Prelude and Nocturne*, Op. 9, in an effort to provide a score that compensated for his disability.³ Despite such examples, pianists with hand amputations provide the majority of instances that define the evolution of music for one hand. In particular, the examples of Count Géza Zichy (1849–1924), Paul Wittgenstein (1887–1961), and Siegfried Rapp (b. 1915) provide interesting insight into the methods by which such individuals and composers responded to their musical limitations.

MUSICIAN-AMPUTEES AND DEVELOPMENT OF MUSIC FOR ONE HAND

One of the first and best documented of the one-handed virtuoso group is the Hungarian pianist and composer Count Géza Zichy (Fig. 2A), born July 22, 1849.⁹ Zichy, at the age of 15, accidentally wounded his right arm in a hunting accident when a horse lunged while he attempted to pull out a rifle from a cart.³ The injury was treated by amputation of the entire right arm at the level of the shoulder. Unwilling to give up music, for which he had a considerable penchant, Zichy wrote his private tutor a dramatic letter instructing him to open it 1 year later, “if exactly one year from today I am unable to do with one hand what other people can with two, put a bullet through my head.”³ It is noteworthy that Zichy went on to become a renowned pianist and composer of his time with more than 200 works to his name, which include *Fantasie über Motive aus R. Wagner’s Tannhäuser* (1883), *Polonaise in A Major* (Transcription of Chopin’s Op. 40 No. 1), and *Piano Concerto in E flat Major* (1900).¹⁰ On a few occasions, he performed publicly with Liszt, playing an arrangement of the *Rakoczy March* for 3 hands. Eduard Hanslick (1825–1904), the much feared and renowned Vienna music critic, wrote of Zichy, “the most astounding thing we have heard in the way of piano playing in recent times has been accomplished by a one-armed man—Count Géza Zichy.”³ Zichy served as president of the

National Conservatory in Budapest from 1875 to 1918 and wrote operas, composed numerous piano arrangements for the left hand, sonatas, piano concerto, ballet, and cantata, and lived a musical life unimpaired by his disability.⁹ In May 1915, Zichy gave a remarkable performance in Berlin to an audience composed solely of men crippled during World War I. His vision was to uplift the spirits of those who had had limb amputations and to demonstrate that physical injury was no impediment to the flourishing of the creative soul.³ Zichy died on January 14, 1924, in Budapest, having provided both a musical legacy and a memorial to the indomitable power of the will.

A second and an even more dramatic example of a one-handed pianist is provided by Paul Wittgenstein (Fig. 2B). Born in Vienna on November 5, 1887, Wittgenstein, the scion of a highly cultured and very affluent family, was from early life exposed to the cognoscenti of artistic and musical Vienna.¹¹ His sisters, Helene, Margarethe, and Hermine, held soirees for Gustav Klimt (1862–1918) and his circle as well as literary gatherings, and his father, Karl Wittgenstein (1847–1913), was a respected patron of the arts and the host of musicians and composers including Gustav Mahler (1860–1911), Johannes Brahms (1833–1897), and Clara Schumann (1819–1896). Of interest is that his younger brother, Ludwig (1889–1951), although not a musician, possessed perfect pitch and was inclined to use musical metaphors in his acclaimed philosophical works (*Tractatus Logico-Philosophicus* [1921], *Philosophische Untersuchungen* [1953], and *Bemerkungen über die Grundlagen der Mathematik* [1956]).¹² Thus the texts of books embracing the philosophy of the mind, language, and mathematics are replete with musical annotations and indeed replicate the original contemplations on the subjects of Plato (428–348 BCE)¹³ and Aristotle (384–322 BCE).¹⁴ Paul Wittgenstein studied piano in Vienna with Malwine Bree, who prepared young Paul to be taught by the Polish teacher, pianist, and composer Theodor Leschetizky (1830–1915), the most respected piano teacher of the day,¹¹ and Josef Labor (1842–1924), the blind organ virtuoso who was responsible for his education in music theory. In 1913, at the age of 26, Paul made his solo piano debut in Vienna, and such was his prowess that during the next season, he became a concerto soloist with the Vienna Symphony.¹¹ This meteoric rise was arrested the following year by the advent of World War I and the Imperial edict obligating him to military service. In August 1914, while leading a patrol near Zamosc, Poland, a sniper’s bullet shattered his right arm, and his subsequent capture by the Russians was

followed by the ministrations of a field surgeon and amputation.¹⁵ Confined as a prisoner of war for 2 years in Omsk, Siberia, Wittgenstein relentlessly exercised his left hand, and in 1916, upon returning to Vienna, he performed his first one-handed recital.¹¹ Such was his brilliance (and family influence) that numerous composers including Sergei Prokofiev (1891–1953), Benjamin Britten (1913–1976), Erich Wolfgang Korngold (1897–1957), Paul Hindemith (1895–1963), Richard Strauss (1864–1949), and Maurice Ravel (1875–1937) (Fig. 2C) accepted commissions from him. Not inhibited by the need for gratitude, Wittgenstein overtly expressed dislike of much of the music penned at his behest, and he declined to publicly play the works provided for him by Prokofiev (*Piano Concerto No. 4*) and Hindemith. A further expression of his less than generous nature was his comment, “. . . since it is no particular attainment of mine I think I may honestly say that I am (perhaps) the pianist for whom the greatest number of special compositions have been written.”¹⁶ Of interest is that Ravel’s “Concerto for the Left Hand” was heavily influenced by the music of George Gershwin (1898–1937), whom he had met during his American tour. Ravel was intense in his desire to produce a magnificent piece and he told a friend, “the listener must never feel that more could have been accomplished with two hands. The piano part must be complete, beautiful and transparent.” Though in declining health, Ravel remained committed to the completion of this composition and often slept only 4 hours a night before finishing the work in summer 1930. The response of Wittgenstein was in character as he subsequently recounted the events of the evening. “Ravel took me to his work room and played the new concerto for me. He played the solo part with both hands, and he also played the orchestral score. He was not an outstanding pianist, and I wasn’t overwhelmed by the composition. I suppose Ravel was disappointed, and I was sorry, but I had never learned to pretend.” Only months later, after he had thoroughly studied the concerto, did Wittgenstein admit that he had failed to appreciate what a great work it was.

Indeed, Ravel’s *Piano Concerto in D Major for the Left Hand* is still regarded as among the best examples of literature for left-hand piano. On November 27, 1931, Wittgenstein gave a public performance of Ravel’s concerto (written to express the tragedy of wartime sacrifices) with the Vienna Symphony Orchestra that was considered nothing short of brilliant. However, when Wittgenstein played the work to Ravel at his home in Vienna, it was reported by Marguerite Long (1874–1966) (Ravel’s companion) that Ravel himself

disliked it! “Alas!” said Ravel, slowly advancing toward Wittgenstein, “But that’s not it at all!”³ Such was the animosity that Ravel subsequently opposed Wittgenstein’s tour to Paris, and 2 years would pass before the composition was performed (1933) in the city.

Many of the pieces that Wittgenstein commissioned are still frequently performed today by two-armed pianists. Some have also been played by other pianists who for one reason or another have lost the use of their right hands, such as Leon Fleisher (b. 1928) and João Carlos Martins (b. 1940). Based on his unique persona, special pianistic skill, and position in society, Wittgenstein became well-known and toured America in 1934. By 1938, with the Nazi *Anschluss* of Austria, Paul was no longer permitted to perform in public concerts and departed for the United States, finally settling in New York City. He spent most of his late years teaching privately in New York (1938–1960) at the Ralph Wolfe Conservatory in New Rochelle (1938–1943) and at the Manhattan College of the Sacred Heart (1940–1945). Wittgenstein enjoyed composing and developed special left-hand techniques and notations such as “4/3” indicating that third and fourth digits should play a note simultaneously and “o” to indicate that certain passages should be played with a fist.¹⁰ These were included in his unusual musical text, *School for the Left Hand* (Vienna and London: Universal Edition, 1957).

In World War II, a parallel to the experience of Wittgenstein in World War I was provided by the East Berlin pianist Siegfried Rapp, who lost his right arm to shrapnel on the Russian front. Inspired by the achievements of Zichy and Wittgenstein and using Ravel’s concerto as a starting point, he made considerable progress and identified Prokofiev’s as-yet unperformed (Fig. 2D) *Piano Concerto No. 4*. Although originally written for the conservative Wittgenstein, *Piano Concerto No. 4* had been rejected by pianists as too abstract to adequately interpret. In his note to Prokofiev, Wittgenstein wrote with his characteristic bluntness, “I thank you for your concerto, but I do not understand a single note and I shall not play it.” On September 5, 1956, Rapp performed Prokofiev’s *Piano Concerto No. 4* in the West Berlin Conservatory Concert Hall and received a mixed reception.¹⁷ Disappointed by this tepid response, Rapp reflected that audiences had changed their attitude toward one-handed pianists in general; “Right after the war, with so many disabled veterans around, I found genuine sympathy among audiences. Today it has become much more difficult for me. Today’s audiences are spoiled by technical perfection, and they look for force of expression in addition.

The two together are hard enough for a man with two arms.”¹⁷

The determination and artistry represented by the performances of Count Géza Zichy, Paul Wittgenstein, and Siegfried Rapp, aimed at amputated war veterans and the general public, inspired less accomplished musicians who had despaired of ever playing again. Their courage and conviction was to embrace the concept that both the hand of a surgeon and that of a pianist may yield a melody understood by all.

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ERRATUM

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