

# Dmitri Shostakovich: a work of virtuosity or a profitable misfortune?

Dmitri Shostakovich: ¿virtuosismo o infortunio provechoso?

Germán José MEDINA-RINCÓN<sup>1,2</sup>, Sofía MARTÍNEZ-GIL<sup>1,2</sup>, Luis Octavio TIERRADENTRO-GARCÍA<sup>1,2,3</sup>, Eduardo Esteban ORREGO-GONZÁLEZ<sup>1,2</sup>, Juan Sebastián BOTERO-MENESES<sup>1,2</sup>

## ABSTRACT

Dmitri Shostakovich was one of the greatest composers of 20th century, famous for his piano and violin compositions. One of the compositions, the 5th symphony, is arguably his greatest work, which brought him back to the grace of the Soviet authorities in a moment of a political crisis in Russia. Among the experts, there is a theory which supports that Shostakovich's talent was due to a traumatic brain injury involving a shrapnel. Moreover, he might have suffered from a neurodegenerative process throughout his life. In this paper, we intend to discuss these viewpoints.

**Keywords:** Neurology; Neurosurgery; Hallucinations; Brain Injuries, Traumatic; History; Music.

## RESUMEN

Dmitri Shostakovich fue uno de los más renombrados compositores del siglo XX, famoso por sus obras para violín y piano. Su Quinta Sinfonía, es para muchos su obra más importante. Esta pieza le trajo gran simpatía con las autoridades militares en un momento de crisis en la Unión Soviética. Entre opiniones de expertos, existe una teoría que postula que el talento de Shostakovich es secundario a un trauma craneoencefálico producido por herida de metralla. También se cree que pudo haber sufrido de un proceso neurodegenerativo. Nuestra intención en el presente artículo es discutir estos puntos de vista.

**Palabras clave:** Neurología; Neurocirugía; Alucinaciones; Lesiones Traumáticas del Encéfalo; Historia; Música.

## AN EMERGING RUSSIAN TALENT

Born in Saint Petersburg in 1906, Dmitri Shostakovich was a renowned Soviet composer. From an early age he was exposed to a musically nurturing environment, mostly due to the influence of his pianist mother. His remarkable talent and instrumental ability granted him entry into the local conservatory at the age 13; under the tutelage of Glazunov and Steinberg, Shostakovich built a musical and personal character that would soon become his signature<sup>1</sup>. His First Symphony, which premiered shortly after the completion of his musical training, granted him the reputation of a bold and

inventive musician. Shostakovich became an icon among other rising Russian musicians<sup>1</sup>.

Dmitri Shostakovich was a revolutionary for his time: early on he departed from his fellow musicians and created a style of his own. His innovative compositions, markedly different from the ones of his chronological peers, represented the synthesis of elements from different musical periods, including influences from both Romantic and Impressionist periods as well as the traditional Russian school<sup>2</sup>.

It is important to consider Shostakovich's social and political context, and its influence on his work. In 1936 Shostakovich premiered his opera "Lady Macbeth of

<sup>1</sup>Universidad del Rosario, Escuela de Medicina y Ciencias de la Salud, Neuroscience Research Group, Bogotá D.C., Colombia.

<sup>2</sup>Universidad del Rosario, Escuela de Medicina y Ciencias de la Salud, Centro de Neurociencia Neurovitae-Universidad del Rosario, Bogotá D.C., Colombia.

<sup>3</sup>Children's Hospital of Philadelphia, Department of Radiology, Philadelphia PA, United States of America.

GJMR  <https://orcid.org/0000-0003-2874-3669>; SMG  <https://orcid.org/0000-0002-6911-8264>; LOTG  <https://orcid.org/0000-0003-1164-4656>; EEOG  <https://orcid.org/0000-0002-8406-4153>; JSBM  <https://orcid.org/0000-0003-1849-8751>

**Correspondence:** Juan Sebastián Botero-Meneses; Email: juans.botero@urosario.edu.co.

**Conflict of interest:** There is no conflict of interest to declare.

**Authors' contributions:** All the authors equally contributed and fully participated in the preparation of this paper. They have contributed substantially with the conception, and design of the work; drafted and critically revised the work for important intellectual content; approved the final version to be published; and agreed upon accountability for all aspects of the work, ensuring questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Received on January 12, 2021; Received in its final form on March 23, 2021; Accepted on April 07, 2021.

Mzensk” in Moscow. Joseph Stalin was in the theater on the opening night. After only a few bars of music, Stalin furiously stormed out. He condemned the opera in an article published in *Pravda*, an official journal; and released an outline of requirements for public entertainment. After that, Shostakovich composed restricted by fear of censorship or imprisonment. All of these transgressions and the opposition against Stalin’s politics rendered him to be known as a “watered-down Prokofiev”<sup>3</sup>.

## A TRAUMATIC EXPLANATION FOR HIS BRILLIANCE

It could be accepted that Shostakovich’s musical brilliance is explained in part by his full commitment to studying and composing. However, curiosity spiked in the minds of some researchers and historians since some pieces of evidence pointed out to an incident that may have impacted Shostakovich’s performance in music.

In 1941, Shostakovich was volunteering in Leningrad’s fire brigades. Apparently, during this time he experienced a head injury. An x-ray showed that Dmitri had a metallic fragment lodged near the temporal horn of the left lateral ventricle. He refused to have it surgically removed alleging that it “filled his head with melodies”. Some authors believe that this may have caused auditory and synesthetic hallucinations, epilepsy, and cognitive impairment; although this last affliction has been proposed as a consequence of his depression, mainly caused by the Soviet regime’s oppression, as the composer was mainly described as “sluggish” or “lethargic” while his wit and judgment never declined<sup>1</sup>. In his book entitled *“The Man Who Mistook His Wife for a Hat”*, the neurologist and writer Oliver Sacks presented Shostakovich’s case and suggested that he might have had musical hallucinations due to focal seizures provoked by gliosis. He presented several other cases of auditory hallucinations and explained how organic lesions could be the cause of unusual, behavioral, and cognitive symptoms<sup>4</sup>.

In 1983, Dr. Dajue Wang, a Chinese neurosurgeon, published an article in *The Musical Times*, a renowned British music journal. Dr. Wang described how, when shadowing an important Soviet neurosurgeon throughout his training, he encountered the case of Shostakovich himself. The composer presented to his consult, expressing concern on the fact that after an incident with a shell explosion in a street close to his residence, he sustained a head injury and a piece of shrapnel ended up lodged within his skull. Shostakovich claimed that after a particular tilting of his head, he would start to hear melodies that later on he would transform into compositions<sup>5</sup>. In addition, Dr. Wang reports that the lead physician-in-charge of Shostakovich’s case, found the object in a head X-ray performed upon his arrival, and even witnessed — through fluoroscopic imaging — the foreign body moving in the composer’s temporal horn of his left lateral ventricle<sup>5</sup>.

An article regarding Shostakovich’s case, written by Donal Henahan and published in *The New York Times* in 1983, further supports the thesis stated by Dr. Wang<sup>6</sup>.

Shostakovich may have had other physical conditions in addition to the ones allegedly caused by the shrapnel. Some doctors reported that Dmitri might have had a motor neuropathy, or even amyotrophic lateral sclerosis (ALS). For over 15 years, the composer had several neurological symptoms, including weakness of the limbs, numbness and paresthesias<sup>7</sup>. Several letters written by Shostakovich, addressed to his sister Nina and some close friends, account for his deteriorating medical condition, as can be read below:

*“My right hand became very weak. I often have pins and needles. I cannot lift heavy things. I find it difficult to brush my teeth...”; “...When I write my hand gets tired. I can only play slowly and pianissimo”<sup>8</sup>.*

## DISCUSSION

Musical hallucinations are the perception of melodies, harmonies, and rhythms in the absence of any actual sound. Frequent causes include psychiatric disorders, dementia, brain tumors, neurosyphilis, substance abuse, and epilepsy<sup>9</sup>. Moreover, auditory hallucinations are a sign of contralateral hemispheric damage<sup>10,11</sup>. Penfield and Perot, for instance, electrically stimulated the right temporal cortex of patients, inducing contralateral musical hallucinations<sup>12</sup>.

Paradoxical functional facilitation (PFF) is the development of a particular skill following neurological injury. There are two types of PFF. The first one, in which the subject has an abnormal functional level for a specific task, and after the injury, that functional status returns to normal or near-normal performance. The second form, in which damage to a neural circuit grants the subject a superior performance in specific tasks compared to healthy subjects<sup>13</sup>. PFF has been described in language functioning, attention-related tasks, memory processes, and sensory and perceptual functions<sup>13</sup>.

Following brain injury, new connections appear in the unaffected areas of the brain<sup>13</sup>. This adaptive response provides rewiring and cortical reorganization in the areas closest to the lesion<sup>14</sup>. Mapping studies in non-human primates, done through functional MRI (fMRI) and direct visualization using marking agents, have shown that originally injured cortical areas, particularly in somatosensory and motor regions, undergo neuroplastic processes that encompass regain of function and even PFF<sup>15</sup>. Since the shrapnel that Shostakovich apparently had was located near the temporal horn of his left lateral ventricle, the primary auditory cortex (Brodmann areas 41 and 42) might have developed new brain connections and undergone cortical reorganization through neural plasticity mechanisms.

In addition, Shostakovich's case is not the first one to present a foreign body embedded adjacent to the ventricular system. In fact, more than six cases had been published prior to the composer's incident, all of which presented with a variety of symptoms, ranging from focal neurological deficits, cognitive impairment, and psychiatric disturbances. Furlow et al, for instance, presented a case with metabolic alterations in which the foreign body was in close relation to the *sella turcica*<sup>16,17,18,19,20,21</sup>.

Shostakovich had his accident when he was 35 years old; nonetheless, he started to compose in 1925, at the age 19. It is possible that he changed his way to compose after his brain injury, which can be explained by the physiological reasons mentioned above. On the other hand, Shostakovich may also have suffered from a neurodegenerative disease, such as ALS. However, patients with this condition have rapid and disabling progress, as opposed to Shostakovich, who

complained of symptoms for decades. In any case, we do not believe that this could have influenced Shostakovich's career as ALS symptoms usually do not include cognitive impairment<sup>22</sup>. Could Shostakovich's talent have been even greater, had he not suffered from this ailment?

Throughout his life, Shostakovich experienced several medical, social, and political circumstances that may have had an impact in his work. Perhaps he had musical hallucinations due to a shrapnel injury close to his primary auditory cortex. Also, he could have even drawn inspiration from his struggles with censorship. Nevertheless, Shostakovich remains as one of the greatest composers of the 20th century. His original and enigmatic style for composing, as well as his role in the post-revolution Russian music make him well known in the conservatoires around the world and among non-musicians. His Waltz No. 2, for instance, has been widely used in many TV shows and films.

## References

- Fay LE. Shostakovich: a life. New York: Oxford University Press; 2000.
- Ivashkin A, Kirkman A. Contemplating Shostakovich: life, music and film. Farnham: Routledge; 2012.
- Schonberg HC. The lives of the great composers. rev. ed. New York, NY: Norton & Company; 1981.
- Sacks O. The man who mistook his wife for a hat and other clinical tales. New York, NY: Touchstone; 1998.
- Wang D. Shostakovich: music on the brain? The musical times. 1983 Jun;124(1684):347. <https://doi.org/10.2307/964059>
- Henahan D. Did Shostakovich have a secret? The New York Times. 1983 Jul 10, Sect. 2;21 [accessed on Mar 27, 2021]. Available at: <https://www.nytimes.com/1983/07/10/arts/music-view-did-shostakovich-have-a-secret.html>
- Kalapatapu VR, Gilkey AP, Pascuzzi RM. Shostakovich and ALS. In: Neurological Disorders in Famous Artists - Part 3. Basel: KARGER; 2010. p. 92-100 [accessed on Mar 27, 2021]. Available at: <https://www.karger.com/Article/FullText/311194>
- Princeton EW. Shostakovich: a life remembered. New Jersey: Princeton University Press; 1994.
- Blom JD, Sommer IEC. Hallucinations. In: Blom JD, Sommer IEC, editors. Hallucinations: research and practice. New York, NY: Springer New York; 2012 [accessed on Mar 27, 2021]. Available at: <http://link.springer.com/10.1007/978-1-4614-0959-5>
- Paquier P, van Vugt P, Bal P, Cras P, Parizel PM, van Haesendonck J, et al. Transient musical hallucinosis of central origin: a review and clinical study. J Neurol Neurosurg Psychiatry. 1992 Nov;55(11):1069-73. <https://doi.org/10.1136/jnnp.55.11.1069>
- Silva MCB, Brucki SMD. Multiple hallucinations due to brainstem injury: A case report. Dement Neuropsychol. 2010 Oct-Dec;4(4):353-5. <https://doi.org/10.1590/S1980-57642010DN40400016>
- Penfield W, Perot P. The brain's record of auditory and visual experience. a final summary and discussion. Brain. 1963 Dec;86:595-6. <https://doi.org/10.1093/brain/86.4.595>
- Kapur N. Paradoxical functional facilitation in brain-behaviour research. A critical review. Brain. 1996 Oct;119(Pt 5):1775-90. <https://doi.org/10.1093/brain/119.5.1775>
- Rainbow Rehabilitation Centers. Neuroplasticity after acquired brain injury. 2013 [accessed on Mar 31, 2019]. Available at: <https://www.rainbowrehab.com/neuroplasticity-acquired-brain-injury/>
- Sophie Su Y, Veeravagu A, Grant G. Neuroplasticity after traumatic brain injury. In: Laskowitz D, Grant G, editors. Translational Research in Traumatic Brain Injury. Boca Raton (FL): CRC Press/Taylor and Francis Group; 2016. [accessed on Mar 31, 2019]. Available at: <http://www.ncbi.nlm.nih.gov/books/NBK326735>
- Campbell E, Howard WP, Weary WB. Gunshot wounds of the brain. Report of two unusual complications; bifrontal pneumocephalus and loose bullet in the lateral ventricle. Arch Surg. 1942 May;44(5):789-98. <https://doi.org/10.1001/archsurg.1942.01210230013002>
- Dandy WE. The brain. In: Lewis DD. Lewis' practice of surgery. Hagerstown: Md: W.F. Prior Co. Inc.; 1951. p. 193-2,12; Chap. 1, 79-r.
- Jefferson G. Removal of a rifle bullet from the right lobe of the cerebellum; illustrating the spontaneous movement of a bullet in the brain. Br J Surg. 1918;5(19):422-24. <https://doi.org/10.1002/bjs.1800051907>
- Small JM. Retained intraventricular foreign body. Br J Surg. 1945;32(127):414-8. <https://doi.org/10.1002/bjs.18003212715>
- Vilvandr  G, Morano JD. Movements of foreign bodies in the brain. Arch Radiol Electrother. 1916 Feb;21(1):7.
- Furlow LT, Bender MB, Teuber HL. Movable foreign body within the ventricle: a case report. J Neurosurg. 1947 Jul;4(4):380-6. <https://doi.org/10.3171/jns.1947.4.4.0380>
- Goutman SA. Diagnosis and clinical management of amyotrophic lateral sclerosis and other motor neuron disorders. Continuum (Minneapolis, Minn). 2017 Oct;23(5, Peripheral Nerve and Motor Neuron Disorders):1332-59. <https://doi.org/10.1212/CON.0000000000000535>