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Robert Schumann's Focal Dystonia

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Abstract

Robert Schumann is one of the most prominent composers of the early romantic period. He was born in Zwickau, Saxony, in 1810. Early in his adolescence, he displayed extraordinary skills in piano playing and attempted to become a concert pianist. After an initial success, increasing technical difficulties hampered pianistic progress in the years 1831 and 1832. Finally, he developed a task-specific loss of voluntary control of the middle finger in his right hand. By means of a finger-stretching device, Schumann tried to improve the situation. In parallel, he composed the Toccata, Op. 7, a piano work which allowed high level virtuoso performance without the use of the middle finger of the right hand. However, from 1833, he almost completely gave up playing piano literature, but continued to improvise. Robert Schumann was suffering from a focal, task specific dystonia of the right hand, also referred to as pianist's cramp. This disorder is characterized by a painless loss of skilled motor control in a task specific context. The neurobiological origin is seen in maladaptive plasticity of neuronal networks with blurring of afferent and efferent receptive fields of adjacent finger representations in the cerebral cortex and the basal ganglia. The general basis of such a blurring may consist in a deficient lateral inhibition of synaptic pathways. Risk factors for developing musician's dystonia are male gender, extensive cumulative practice time, extreme motor workload concerning the temporal and spatial quality of the affected movements and personality traits such as proneness to anxiety and perfectionism. All these factors can be demonstrated in Robert Schumann's early life.

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Introduction and Biographical Sketch

Robert Schumann is known to us as one of the most creative and fruitful composers of the romantic period in the first half of the 19th century. However, in his younger years, Robert Schumann had the ambition to become a concert pianist excelling the most prominent virtuosos of his time, 'playing warmer

than Moscheles and greater than Hummel', as announced by his piano teacher Friedrich Wieck in a letter to Robert Schumann's mother. His piano playing career was short. Which circumstances led to the termination of his career as a pianist? This biographic study concentrates on the years 1829–1833 and on the development of his neurological disorder, a loss of fine motor control in his right hand that took place during this time. It is based on a thorough review of his medical history using predominantly contemporary sources, especially Robert Schumann's diaries and letters. The psychological crises of that time and his later developing psychiatric disorder will not be included into this case report. They have been reviewed in the past by several biographers [Ostwald, 1985; Lederman, 1999; Steinberg, 1999].

Robert Schumann was born on June 6, 1810 in Zwickau as the fifth child of the bookseller, author, and publisher, Friedrich Schumann. At the age of 7, Robert received his first piano lessons and father Schumann purchased a highly valuable grand piano and allowed his son to play for him daily after lunch. After only a few years, his first piano teacher, Baccalaureate Kuntsch declared himself incapable of giving Robert further lessons, so that Schumann, with regard to his pianistic education, was left to his own means as of 1825. In 1826, his father died and Schumann agreed to his mother's strong recommendation to pursue a career as a law student in Leipzig, despite his preference for piano playing. The great pianistic skill and excellent sight-reading alongside considerable technical shortcomings were noticed by the prominent piano teacher Friedrich Wieck, who, beginning on August 1, 1828, gave lessons to the fledgling law student.

In 1829, Schumann transferred to the University of Heidelberg to continue his studies of jurisprudence with the highly regarded expert Anton Justus Thibaut, who also happened to be an enthusiastic amateur musician. Schumann used the many occasions of performing in private salons and increased his piano practice up to 7 hours daily, neglecting his law courses. Undeniably, the progress desired at the time was not always attainable: '*2 hours finger exercises – Toccata 10 times – finger exercises 6 times – variations 20 times myself – and it still didn't work with the Alexander Variations in the evening – frustration over this – extreme frustration (January 4, 1830)*' [The texts written in italics are diary entrees. They are quoted according to Robert Schumann, Tagebücher, in Eismann, R, Stroemfeld/RoterStern Verlag 1971, Band 1–5]. However, three weeks later, Schumann did play the same Alexander Variations, – an extremely difficult virtuoso piece of Ignaz Moscheles, – with considerable effect. This was his first and only public appearance on the piano. In a famous letter to his mother, dated July 1830 he finally stated his intention to pursue a pianist's career and urged his mother to write to Friedrich Wieck, asking him to accept Schumann as a piano student.

The Return to Leipzig

He returned to Leipzig for a second time in order to continue his studies and from the very beginning, he encountered many more problems. Robert was under enormous pressure to succeed. In order to pacify his mother, he had agreed to a six month trial period, after which Wieck would decide whether or not Robert was suited to a career as a pianist. Financial worries forced him to write ever more desperate letters of request to his home. He finally moved into a small apartment in the house of his piano teacher Friedrich Wieck. The spatial closeness to this personality likely caused a change in the perception of his teacher. Schumann discovered, much to his disappointment, that Wieck was less interested in his training than that of his daughter Clara. It remains unclear, whether or not Wieck, as early as the end of 1830, had noticed the physical limitations and especially the diminution of Robert Schumann's fine motor skills, and due to this, changed his prognosis.

In the diary entries, beginning in the spring of 1831, there are a noticeably frequent number of entries concerning playing technique, hand position and relaxation. It is a mix of frustration mingled with the occasional, ever diminishing experiences of success at the piano. The month of May 1831 seems to be a key month in this regard, in which the technical playing difficulties are revealed:

May 12th: *Much piano played, Field's Rondeau, Moscheles' third etude, my middle movement – very relaxed in the etudes.*

May 13th: *Got up early – My soberness is rewarded; played very well – soft, pearl-like tune and fantasy.*

May 14th: *Piano playing yesterday was quite satisfactory and made progress. Should Wieck be right about my studies?*

May 25th: *– Piano bad – the Moscheles Etude timid and unsure – Where does that come from? Been playing on it for fourteen days, attentively and persistently studied.*

July 5th: *The Chopin is going excellently; today is the fifth day on which I have studied four hours each day. If only there will be no relapses! Protect me, my genius and never disappoint me!*

July 9th: *My dear Robert, don't lose your courage if it is not flowing and going so well, like in the last eight days; practice patience, lift your fingers quietly, hold your hand still and play slowly: and everything must come back together.*

July 13th: *The piano didn't want to work yesterday; it was as if someone was holding me by the arm.*

July 21st: *It has been sincerely miserable on the piano the past several days; I cried yesterday with rage.*

August 14th: *Now I want to proceed in such a manner with my quiet art: since I know where it is, it must also be reachable; if only I had no fingers and could play with my heart for others!*

Schumann worked on a change in his hand position, which temporarily brings an improvement in his attacks:

October 13th: *It is going quite well with the piano, excellently in the past few days. The flexibility is shocking and the tunes are flowing and progressing as in old times.... I am holding my wrist a little higher, approximately like the Belleville (famous female piano virtuoso), even though the graceful, wavelike line is missing.*

While Clara Wieck and her father were on a concert tour in Paris from September 1831 until April 1832, Robert developed an apparatus to improve the strength of his middle finger, and questionably that of his index finger as well. The doctor and friend Dr. M. Reuter remembered 10 years later in a letter from 1841 [Rothe, 2002]:

He mentioned first in his youth that the pointer and middle fingers had noticeably less strength and flexibility than the other fingers. The long term usage of a machine, with which the aforementioned fingers were pulled closer to the back of the hand, led to a state similar to laming, to the degree that they first, only had a weak sense of feeling and secondly, with regards to movement, could no longer be controlled by will.

Schumann christened this device 'Cigar mechanics'. Later he revealed to friends that he had constructed a sling that was attached to the piano, which pulled the middle finger upwards and held it there. The other fingers remained moveable at the keyboard.

May 7, 1832: *It is going pretty good with the third finger through the 'cigar mechanic'.*

Now and then, Robert became hopeful:

May 11, 1832: *Yesterday I composed and played; the new method is the only one that works; it is the one.*

But also this attempt at self-therapy does not help for long:

22. 5. 1832: – *the third finger seems really irreparable.*

June 14, 1832: *The third finger is completely stiff.*

After this entry, there are no more clues to be found about Robert's hand ailment in his diaries. The subject seems to be closed. Apparently, Robert had finally given up the plan to become one of the greatest piano virtuosos of the time. This relieving decision was certainly made easier through the first successes of his compositional work – he had switched from one life's goal to another. He formulates this in a letter to his mother, just two years after giving up his piano studies [Schumann, 1898, p. 176]:

TOCCATA
(Composée en 1830, revue en 1838) R. SCHUMANN
Op. 7

Allegro (♩ = 108)

Fig. 1. Beginning of the Toccata Op. 7. This extremely difficult piece can be played without the middle finger of the right hand. Verlag Eduard Hallberger, Stuttgart, 1890; in: Hallbergers Prachtausgaben der Romantiker.

... Do not worry about the finger! I can still compose, and I would hardly be any happier as a travelling virtuoso – for that, I was spoiled at home. It doesn't bother me when I improvise.

Even my old courage to improvise in front of people came back.

A special work for piano accompanies the difficult years from 1829–1833 – and was quite possibly inspired by the movement disorder. This is the ‘study in double notes’, the later Toccata Op. 7. In the figuration of the right hand, the middle finger can be largely left out (fig. 1). The third passages starting in measure 32 are somewhat uncomfortable, but by alternating the ring and index fingers, the upper voice is quite playable. It is not a far reach to say that this is an attempt to find a creative solution to the movement disorder through avoiding the use of the middle finger. Schumann drafted the piece as an etude and was proud of the horrendous difficulties, which the Toccata offered. He wrote to his mother on July 2, 1834 [Schumann, 1898, p. 240]: *Take the attached piece (the Toccata) as proof of my continuing efforts. Anybody in Zwickau will hardly ever make it.*

The Toccata Op. 7 is probably the most original of Schumann's early compositions. It is closest to the romantic, demonizing style of Liszt and Paganini. The piece had an enormous impact on the contemporaries. In a review of one of Clara Wieck's piano evening on November 9, 1834 [Boetticher, 1984] it was

said: *'The last piece made a wonderful impression, a Toccata from Schumann – the work is a mold of originality and novelty, and in spite of its strict style, it worked with a deeply gripping magic on all the listeners.'*

Medical Treatment

Even though Schumann had inwardly distanced himself from virtuosity, he still tried, from the spring of 1832 to the summer of 1833, to improve his situation through medical measures. The treatment included rest, diet, electricity, bathing the hand in animal blood, and homeopathy. All new and expensive treatments of the day that were available were – unsuccessfully – utilized [Neumayr, 1989]. Little noticed is, however, that Schumann did not completely become silent at the piano. Improvisation still belonged to his daily musical activities. Even in the spring and summer of 1832, in the time of the critical worsening of his movement disorder (June 6, 1832: *'the finger is completely stiff'*), Robert tells about incredible experiences at the piano:

May 29, 1832: *....as I came home, close to nine o'clock, I sat down at the piano and it seemed to me that utter flowers and gods were coming out of my fingers, such was the stream of thoughts.*

July 4, 1832: *...How long and overflowing did I fantasize yesterday.*

It is surely the freedom of the choice of musical means, which made it possible for him to compensate for his movement problems while improvising, similar to the case of the Toccata. Furthermore it can be assumed that the degree of the fine motor skill disturbance varied. Schumann still played piano literature, mostly to get to know particular works. He preferred to perform his own, in part very demanding pieces in small private contexts. Hironymus Truhn describes Schumann's piano playing in the year 1837 as quite impressive [Jansen, 1883]:

'He moved his fingers with an almost frightening speed, as if ants were crawling around on the piano; he played his own things – I honestly never heard anything else from him – with only very little accentuation, but with lots of usage of both pedals. In the last instance, one naturally must not find a lacking of taste; he only played with as much pedal as needed to help a not so grand piano.'

Diagnosis

There has been much speculation about the causes of Robert Schumann's hand problems. Even the finger affected was under discussion. In a letter to Agnes Carus in September of 1830, Schumann reveals pain in the ring finger of

the right hand in the winter of 1829/1830 [Schumann, 1898]. In the retrospective report of Robert's friend Dr. Moritz Reuter, the index and middle fingers are discussed [Rothe, 2002]. A loss of control in the middle finger of the right hand is described in the diaries beginning in May of 1832. On the whole, these precise and repeated diary entries from the critical time period around 1832 speak clearly for an isolated and painless loss of control in the middle finger of the right hand. It is noticeable that the extent of the pain symptoms was overestimated by many biographers. Indications of pain in the hand or arm existed only after an arm injury in December 1828. These were sufficiently explained by a fall after too much wine and did not really affect Schumann after the fact [Altenmüller, 2004]. Several diagnoses are discussed in the literature. Edler [1982/2002] diagnosed a 'complicated, seeping tendinitis followed by stiffening', Fahrer [1992] an 'augmentation of the extensor tendon of the middle finger through the cigar mechanics', Franken [1997] the 'result of an arsenic treatment in 1831'. None of these three diagnoses can be applied. A complicated tendinitis would have caused a great amount of pain if it had occurred at close to the same time as the movement disorder. Such pain was not mentioned in the diaries or letters. An augmentation of the extensor tendon due to the 'cigar mechanics' can be eliminated because the causality was reversed: the stretching mechanism was supposed to better the movement disorder. The completely uncharacteristic symptoms speak against the diagnosis as a result of an arsenic treatment for syphilis. Arsenic poisoning leads to pain, stomach and intestinal cramps, and numbness and paralysis of the feet and hands. A paralysis would also have affected the hand outside of piano playing. Neither an arsenic treatment nor any symptoms of poisoning were mentioned in the diaries or letters in May of 1831, the assumed time frame of infection and potential therapy. After sexual contact with his lover Christel (Charitas), Schumann reports in his diary on May 12, 1831 about a wound on his penis, which could be considered a syphilis infection. It is, however, atypical that the wound hurt, and that treatment with quicksilver or arsenic was not recommended, but instead baths with narcissus water, which was supposed to reduce inflammation. Schumann especially, who tended to be a hypochondriac, would most likely have mentioned a dangerous arsenic therapy and the resulting side effects in his diary.

Robert Schumann suffered from a task-specific focal dystonia, a musician's cramp. It is the only diagnosis, which can sufficiently explain all of the symptoms and the progress of the sickness. Already Merriman et al. [1986] suspected a focal dystonia as the underlying pathology; however, without providing supporting empirical evidence in detail. Merriman's viewpoint was adopted by Lederman [1999]. The entries from his diaries, the attempts to compensate the disorder by composing piano music extremely well suited for the disorder in question and the circumstances under which the illness broke out, do not leave



Fig. 2. Presumed hand position of Robert Schumann's dystonic right hand when playing the first bars of the Toccata. Note the middle finger in hyperflexion.

any doubt concerning this diagnosis. Beyond that, according to new epidemiological studies, Robert Schumann had the typical profile of an 'at-risk patient' [Altenmüller, 2003]. In summary, Schumann's medical history in the years 1829–1832 is the first convincing, documented case of this illness.

The musician's cramp is a neurological disorder characterized by the loss of fine motor control of long practiced skilled movements during instrumental playing. It is related to writer's cramp, but seems to be more frequent in the population at risk. On average, 1 of every 100 musicians in Germany will develop musicians' cramp. Men are affected approximately six times more frequently than women. The movement disorder is usually task specific limited to instrumental playing and does not extend over to other movements. There are no indications that Schumann's writing skills were affected, even though his editorial and compositional work required many hours of writing each day over a long period of time. There was no pain or deformation associated with the loss of control. Probably beginning in May 1831, Schumann's middle finger involuntarily drew itself in. In a possibly unconscious attempt, Robert Schumann composed the final version of the Toccata, Op. 7. Figure 2 shows just such a hand position with a curling middle finger during the playing of the first measures of the Toccata.

Although the neurobiological origins of this disorder are not yet completely clarified, it is probable that musicians' dystonia is in most cases due to

dysfunctional (or maladaptive) brain plasticity. Support for this theory comes from a MEG study performed in musicians with focal dystonia. Compared to healthy musicians, the dystonics showed a fusion of the digital representations in the somatosensory cortex, reflected in the decreased distance between the representation of the index finger and the little finger when compared to healthy control musicians [for a review, see Münte et al., 2002]. Such a blurring of receptive fields of the digits may well result in a loss of control, since skilled motor actions are necessarily bound to intact somatosensory feedback input. The pathological mechanism of the blurring may be based on an impaired lateral inhibition of adjacent neuronal networks processing afferent information from single fingers. With a corresponding genetic predisposition, this disintegration can be accelerated by excessive and intensive practicing. The emotions play an important role, since the fixation of incorrect motor programs happens especially intensely under the influence of anxiety and stress hormones. Musicians with focal dystonia very often suffer from anxiety disorders and from perfectionistic tendencies [Jabusch et al., 2004]. These personality traits are present long before the beginning of the sickness and can also be recognized in Robert Schumann. According to newer epidemiological studies, the high-risk group is considered to be young to middle-aged men who play classical music, whereby guitarists and pianists are affected most often. Within the instrumental groups, those who spent the longest time practicing their instrument on average during their studies were most at risk. Practice time, professional position, and personality traits stand in close mutual connection [Jabusch et al., 2005].

The therapy for focal dystonia remains problematic to this day. In Robert Schumann's case, the result of the treatment with the 'cigar mechanics' and the other therapy attempts is clear – a career as a pianist remained unattainable for him. On the whole though, his sickness must be seen as a mild and non-progressive form since he was still quite able to play piano. The improvisation at the piano must have been a return to the roots of music for him, connected to an inner freedom from fear, doubt, and from the extreme pressure of pianistic perfection. The energetic diversion of his creative potential to composition shows the tremendous will for creation, which had already set him apart as an adolescent. For us, Schumann's decision to follow a career as a composer was a blessing, because it allowed his creative talent be developed to masterful perfection.

Acknowledgement

The author wishes to thank Dr. Hans-Christian Jabusch, Hannover, for his many valuable suggestions on an earlier version of this paper.

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