THE MOZART EFFECT TODAY

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1. What is the Mozart Effect?

The Mozart Effect is (sadly) a general, almost generative term, signifying the effects or, better said, the transformational powers of music in health, education and even in the individual's conception of the world. Although it started from a precise denomination of the beneficial consequences of Mozart's music, today this term globally signifies and characterizes the practical effects of the musical art, while also referring to the reduction of stress, depression and anxiety, induction of relaxation or of beneficial sleep, activation and mobilization of the body functions, or improvement of memory and attention.

There have also been (more or less scientifically controlled) experimental uses during the past decades, which, with the help of sound or music therapies, were meant to cure certain disorders like attention deficit disorder, listening deficit disorder, dyslexia, autism, epilepsy and many other mental or physical disorders.

From all that falls under the (much too large) umbrella of this syntagm we note that, in fact, the Mozart Effect tends to cover almost all the areas that traditionally (as proven by science, or simply given certain cultural dominances) refer to the implicit benefits of listening to and playing music upon individuals or groups of people.

2. Aspects of the tradition

The therapeutic character of the musical art has been known and acknowledged for over three thousand years by the great ancient civilizations, whether Far Eastern, Mediterranean, Scandinavian or Celtic. The ancient Chinese used to combine traditional medicine treatments with specific musical pieces composed and/or selected especially for their traditionally acknowledged

beneficial effects. The great Chinese mythological tradition, however, implies the knowledge and practice of music at a much higher level of knowledge and order of the universe, of the vital cycles, of the seasons' cycle, of the calendar etc. Emperors and high dignitaries were supposed not only to know, but also to play music in complex rituals. We find these aspects in various forms, whether concretely practicable or simply metaphorical, in all the Eastern and Far eastern mythologies.

In the great Mediterranean civilizations: Phoenician, Cretan, Etruscan, Hellenic or Latin, music was closely linked to the religions of the times. It implied a fundamentally abstract character of knowledge of the universe, but also that of a concrete action meant to positively influence man's health and the universe's rationality. Religion and practical thaumaturgy are inextricably linked, whether we talk about creationist principles, histrionic rituals, or mystical naturist treatments. This holds even today, when we witness an unprecedented proliferation of simplistic naturisms based on creationist or scientologist mythologies[43].

In the context of the great philosophical and scientific tradition that we inherit from antiquity, Pythagoreanism holds the priority and preponderant place. Pythagoreans developed a coherent and exhaustive theory on the organization of the universe according to the acoustic musical laws, along with a method of individual or collective therapy applying these theories. Music performers had, from times immemorial, been designated by the term *thaumaturge*[44], while in contemporary Greek society they used to be credited with the power of healing the body (*soma*) and soul (*psyché*) from negative influences. The Greeks created a true ethos of practical aspects regarding morphological and syntactic elements of the musical art: rhythm, meter, melody, form (which has no equivalent expression today), which made them suitable to be sung in specific situations, with undeniable (for them) results. In fact, the roots of the theory of musical and literary genres lie in the same strong belief in the thaumaturgic role of musical art that was producing typologies like *praktikos*, *entousiastikos* or *ethikos*.

The Christian Middle Ages did not fully eliminate these views and practices, assimilating them as much as possible in a vision that was in line with the Christian dogma. We note, however, a rather cautious and sober approach, using the *music-poetry* binomial in incantatory forms that were part of the obligatory liturgical rituals, but also of certain expiation or exorcizing procedures. What survived, however, far from the institutional control of the Church, were the "enchantments" (*incantatio)* and the "disenchantments" (*discantatio).* The rational Renaissance and later the

[43] The area is so vast (and uncontrolled) that any kinds of mythologies and naturist practices are included in what is called the *New Age* movement. However, having a weak scientific basis, often vague or even non-scientific, they belong to the realm of beliefs and faiths rather than to the realm of truth. Surprisingly, they enjoy phenomenal success even among educated people, generating "prophets" and therefore also related businesses.
[44] from the verb *thaumasein* (= to heal) and the noun *ourgeeia* (= force, element).

passionate Baroque brought about a mutation of these old traditions into the field of the "theory of affects", which specifically designated any musical expression configured as such and associated it to a particular type of external affect (expressible feeling) or internal one (psychic state induced by sensibly expressive realities). The 18th and 19th centuries pushed these aspects towards an arbitrarily rationalized (*Classicism)* or personalistically idealist (*Romanticism)* aesthetics of a better and better-configured musical art, which too was associating expressiveness with certain results that were determinable from the content, form and expression of the musical typology.

The 20th century came at last with a definition of what should have been a "musical therapy" based on scientific grounds, controllable by experiment and applied within stable frameworks that could lead to veridical inferences. We notice that the interest in music therapy has risen from time to time, only to drop again, for a while, into a relative oblivion. The field of music therapy obviously contains many independent variables pertaining to local conditions, short-lived fashion trends, emergence of charismatic or convincing scientific personalities, as well as to media or showbiz manipulations.

There are also fundamentalist prophets of the Mozart Effect like Don Campbell, for whom Mozart's music is not only beneficial, but also curative for anything from headaches, toothaches, arthritis and rheumatoid disorders, to drug or alcohol addiction, as well as contributory to the improvement of physical fitness or even to sexual performances. Campbell firmly states that music is a universal panacea for almost any type of physiological affliction. Any elementary common-sense criticism will obviously and promptly demolish such assertions, although, on the other hand, they continue to circulate and have fanatic supporters or groups of adepts, guided by random, contradictory or even aberrant criteria.

In our opinion, the thaumaturgic character of musical art is one of the most effective and beneficial effects ever discovered in the human symbolic and expressive manifestations. At the same time, music therapy is an area of (partly) reliable and beneficial scientific knowledge. We also note, however, that except for certain remarkable studies (recently conducted by German, Russian, British or American researchers), the approaches are generally sporadic and shallow, and the original enthusiasm lacks continuity, probity, acriby and scientific rigor.

3. The Mozart Effect today

This is also the case with the so-called "Mozart Effect", approached sporadically during the last decades (especially as an American trend), and supported by the good-faith naiveté reiterating long-known platitudes, rather than by rigorous scientific demonstrations.

The recent history of the phenomenon started in France in the 1950's, when physician Alfred Tomatis performed several auditory stimulation experiments on groups of children with

learning and communication disorders. The phenomenon was borrowed, copied and turned into a career, so that by the end of the century it proliferated in hundreds of centers all over the world, using Mozart's music to cure various deficiencies especially in children. Despite the lack of a coherent basis of argumentation and demonstration, we notice that the music used in these experiments is mostly Mozart, especially pieces with solo parts played in high range (violin, flute, oboe), or some of his symphonies. In this respect, it can be argued that there is a huge amount of music sharing similar (albeit in no way identical) configurations and expressive qualities to Mozart's music, and that the selection of the high frequencies is also arbitrary and debatable. Although we do not intend to draw a conclusion about this phenomenon, we notice that the musical pieces used are generally exploring the most banal idiosyncrasies of an amateur audience, to say the most. Meanwhile, determinations derive from the realm of external knowledge, building a repertoire by manipulating the "public success", rather than from that of a thorough knowledge of the music used.

There have been, however, experimental studies of a more rigorous nature, such as the research conducted by John Irvine at the University of California, on the connection between Mozart's music and spatial intelligence. The experiments organized systematically at the University of California are an attempt toward a more rigorous and scientific approach of the neurophysiological premises on which the Mozart Effect might be based. Lab animals were exposed *in utero* for six days and then for another six days after birth to various types of auditory stimuli, with the purpose of controlling the alleged improvement of spatial reasoning skills (or rather, in the case of these animals, i.e. laboratory guinea pigs, the improvement of spatial orientation effectiveness). The test group exposed to Mozart's music was the quickest to get out of the standard maze and made considerably fewer errors. On dissection of the neuro-anatomical areas of the brain responsible for orientation, small (and not entirely convincing) neuronal growth patterns were detected in the spatial areas of the hippocampus region and of the neocortex. It is, however, possible that any type of music, or even of any type of sound stimulation, will contribute to the development of these areas, for the perception of sound is always one of orientation in space. It fundamentally follows the source of sound, and reacts and orientates itself by it.

The study, initiated in 1993 by John Irvine in cooperation with physicist Gordon Shaw (a former concert cellist) and Frances Rauscher (cognitive development expert), was applied to a group of college students. They were exposed to 10 minutes of the Mozart *Sonata for Two Pianos in D Major* (K.448). Following the experiment, an enhancement of the spatial-temporal reasoning was found based on the Stanford-Binet IQ test. We should note, however, that these tests have not been confirmed by any other source and that the results are short-lived. They occur right after the audition, but further testing yields random and inconclusive results. It is possible that the results

are real but short-lived, and that they contain a considerable amount of suggestion and (possibly) autosuggestion, resulting in a higher degree of motivation and enthusiasm, which would explain the results of the experiment.

Recent studies have been conducted in England (Manchester University) on the effect of Mozart's music on epileptic patients. Encephalographic (EEG) measurements of the neuronal activity show that music activates both cerebral hemispheres (and not only the left one, as was believed so far).

The neural activity was recorded in patients who had undergone surgery for the treatment of certain epileptic disorders. During this study, patients heard a song by Mozart, a folk song, or the theme from "Miami Vice". These different kinds of music have indeed different effects on the neurons in the temporal lobe. The Mozart song and folk song reduced the activity in 48% of the neurons while the theme from Miami Vice reduced the activity in only 26% of the neurons. The Miami Vice music increases the activity in 74% of the neurons, while Mozart and folk music increase the activity in only 20% of the neurons. Although these results show that the temporal lobe is directly involved in musical activities, it is unclear exactly how it is used in the qualitative appreciation of the musical message. The only certain thing is that Mozart's music creates a calmer and more relaxed atmosphere than the "tempest" caused by the "Miami Vice" theme. It reduces excessive excitation and consequently it reduces stress, too. But this we already knew, without the help of an EEG!

There is, however, a fundamental breach in what should be a pre-eminently interdisciplinary research theme. Such research is generally conducted by psychologists and psychiatrists of a (probably) high level of competence, but whose musical literacy does not extend beyond an amateur and sub-average level. Contrariwise, musicians, whether musicologists or composers, have no competence in cognitive psychology, behavioral psychology, perceptive psychology, nor any practical experience in psychiatric treatment, and are therefore excluded from the ranks of the researchers in this field. A serious preoccupation with the research and study of these two (still separate) fields would assume a constant concern for the formation of specialists and of long-term interdisciplinary research teams.

4. Effects of the Mozart Effect

Music professionals probably prefer Mozart's music for its high degree of perfection, its subtlety and clarity of expression, the amazing effectiveness with which sonorous resources are exploited, and (eventually) for a certain idiosyncrasy that turns the Mozartian "legend", born at the dawn of Romanticism, into a myth. There is a general perception, equally true and false, that Mozart is the supreme musician. For in him music has reached its utmost, simplest, clearest, and

most direct form, deprived of artifice and science, nothing but pure expression. It all depends on the perspective and criteria used when assessing Mozart's work. For in Mozart's case we find both the supreme legerity of music's playfulness, and, to the same extent, the conscious and painful effort of intellectual labor, leading to works whose complexity excludes the shallowness of instinctual creation.

We have noticed, however, that the researches using Mozart's music to stimulate (in the cases of attention or communication disorders) or, on the contrary, to soothe, reduce stress, or relieve depression or anxiety, have not surpassed the level achieved by Doctor Tomatis, in France.

Everywhere we hear the same fast, high frequency musical pieces, with their supposedly exciting effects, or slow fragments or pieces in the medium or low register, selected for their soothing properties. One could even say that we have never gotten past the year 1618 (Descartes - *Compendium Musicae*) or perhaps 1636 (Descartes – *Sur les passions de l'ame*). Today's market abounds in albums promoted insistently in any conceivable form by usually obscure recording companies, which more often than not contain performances of doubtful quality. How does a music delivered in such poor performing variants work upon an intellect, or upon a soul? This is rather (and has been for a long time) a prosperous business of an aggressive ignorance winning over the musically uneducated masses.

Another important point brought up by the "Mozart Effect" theories is the claim that music (i.e. Mozart's music) improves attention and concentration. In this respect, it is often associated with special learning processes meant to improve performances in this field. Although this may be true on a general and intuitive level, there are multiple factors that can intervene in musical knowledge and in the brain's ability to concentrate and focus attention. These are independent variables related to tempo, meter, melodic typologies, tonality, as well as physiological, psychological or even aesthetic factors, which are not always measurable or controllable. We cannot generalize the consequences of these procedures on a randomly selected public. Considering that the psycho-physical or characteriological traits are in general highly individualized, it is difficult to draw generally valid inferences from this context.

Other experiments have also been performed on preschool and schoolchildren who were exposed to auditory stimuli, with no convincing effects on their further development. Although mentioned ad nauseam in the pseudo-scientific and popularization literature, these alleged beneficial effects lack a sound scientific basis. For "the learning abilities, the further professional development, the capacity to develop and maintain profound and stable affective relations and the high communication skills do not have a solid basis in the contemporary neurosciences".[45]

[45] John Bruer, http://lrs.ed.uiuc.edu/studentd/lerch l/edpsy/mozart_effect.html.

On the other hand, however, it is obvious that the attempt to "decipher" or order a sonorous flux according to different criteria of form, regularity, symmetry, transfer, transposition etc. is beneficial. It develops both the global memory and the specific memory, and creates and enhances spatial-temporal reasoning. However, in the absence of some minimal formal criteria, it is hard to decide what the effect on a certain group of subjects is, or if they only have impact on those who are "already prepared" to hear, notice and order them. We reiterate here the problem of specific gifts and talent. (German statistics) It is hardly understandable why in secondary and high schools they still teach complex forms of literary genres while completely ignoring even the slightest references to their closely related musical forms.

5. The auditory context

Today we are continually immersed in an ocean of sounds, which is most of the times a sonorous cacophony coming from the essential sources of our civilization: transportation, communication, mass-media, simultaneous discourses without address, passive listeners who do not really listen etc. It is beyond a doubt that if we could select (and eliminate), at least partly, the auditory context that we are permanently subjected to, some relatively beneficial consequences should be expected. The benefit, however, depends on the genre of the music „consumed", and in this respect, it is quite difficult to turn the interest of someone from rock, folk or *manele* music, to Mozart. Such a public should be, instead, fortuitously and involuntarily exposed to such music, in general and/or compulsory high traffic areas like railway stations, airports, stores, schools, institutions etc. It is hard to estimate, however, if this would not lead to a resistance to Mozart's music, or even to its vulgarization through repetition.

6. Pragmatic use for performance purposes

Certain people have a positive response to music, which helps them concentrate and perform their study and/or creativity tasks faster and more effectively. Here again we cannot generalize, for there are also people (we are not aware of any statistics in this field) who are disturbed by the sonorous context (be it Mozart's music), due to a negative hypersensitivity to sounds causing distractibility and poor performance. Individuals with a positive response to music may learn, by repeated experiments, which styles of music help them on certain urgent tasks and how. Although this continues to be an interesting field of study in which we can create beneficial automatisms, the individual selection of taste in a certain aesthetic culture is quite considerable. It is hard to believe that certain "ready-made cans" – so common nowadays – have a beneficial effect. Rather, we can conceive of certain learning processes enabling individuals, through self-

knowledge and awareness, to appreciate the quantity and quality of the music that can help and stimulate their creativity.

Another tempting theory is that education through vocal and instrumental training (the piano, for example) is superior to computer-assisted instruction in terms of abstract thinking. Serious experiments have been conducted in this respect on three groups of preschool children. The first group were given private piano and singing lessons. The children in the second group received private lessons of computer operation, while the third group were a control group where the children did not attend any form of lesson. Those children who received music lessons generally performed 34% better on the standardized spatial-temporal tasks. These results argue that music education develops the higher brain functions required for abstract tasks like mathematics, physics, or abstract strategy games based on predicting skills, like chess.[46] We are not at all surprised by these results, considering that the musical art, when directed toward a deep understanding of the phenomenon and not just toward teaching physiological abilities or mechanical performances, is actually consubstantial with mathematical reasoning and with the ability to predict certain phenomena with a well-defined syntax. A highly trained musician is able not only to predict the logical sequence of a discourse, but also to improvise discourses based on certain stylistic traits and containing complex syntaxes.

Sadly, however, today's musical education has lost much of its active, improvisatory and creative character, which has for centuries been a primal characteristic of musical art. The greatest composers and performers have been, without exception, great improvisers and real-time "constructors" of rich, nuanced and imaginative discourses that are hard to equal in other areas of human creation. The science of music, on the other hand, must develop spatial-temporal skills for the abstract manipulation of sound objects. Our graphic representations of the musical discourse do not match the physical acoustic reality, in that they are a conventional language merely suggesting the relationships between sounds. The functions of the various morphological elements and constructs, the syntactic relationships between the constituents of the musical discourse and the spatial-temporal relationships involved in the organization of the musical form are represented arbitrarily. All these make the musician an abstract thinker evoking the ineffability of sound. "Music indeed is a language of the imperceptible, of the ineffable, of the mysterious. All these, however, are pursued by the composer through concrete, precise and perfectly definable compositional means".[47]

[46] Neurological Research, February 1997.
[47] Pascal Bentoiu, *Imagine şi sens* [Image and Meaning], Editura Muzicală, Bucureşti, 1982.

7. The social status of musical art

The U.S. Congress has recently (4 May 2004) passed a resolution supported by 32 representatives and voted by an absolute majority (402 to 0). The resolution recognizes the benefits and importance of school-based music education. The resolution states that music education grounded in rigorous instruction is an important component of a well-rounded academic curriculum. Music education should be introduced to all the US public schools and, if certified, should work to the learner's advantage.

Although the American initiative deserves our admiration, it should not be overrated, for it has remained a purely declarative resolution with no direct impact on the educational policies, and has no mandatory character. As usual, such initiatives are generous and at times even sincere, but they remain at the declarative phase and are eventually stopped by the bureaucratic machinery. Besides some similar public standpoints currently assumed in certain European cultural and political forums, we notice the worldwide reduction of music education programs and the continuous degradation of the structural and financial situation of professional music institutions.

Romanian music education, in its turn, is on the verge of a real "catastrophe". And that is at all levels. From that of the teachers, whose level of motivation and professionalism is decreasing continually, to that of the management at school, ministry and government level, putting music education under the pressure of reducing the number, cost, level, or even forbidding the teachers' benevolent, unpaid work. This is a drastic degradation from what used to be in the '70-'80s, when the Romanian music students were constantly taking the top places in international competitions.

However disputable, problematic or insufficiently studied the Mozart effect may still be, we warmly recommend a fast and intensive program with a sound dose of Mozart music to increase the communication, understanding and creativity and decrease the level of arrogance and omniscient self-sufficiency of all those decision makers who are calling the shots in politics and especially in Romanian education.

8. Questions

The Mozart Effect theories speak about the generally beneficial role that music plays in several areas: attention, concentration, relaxation, stress reduction, development of spatial intelligence, development of reading and listening understanding skills, improvement of communication skills and even increase of the IQ level.

All of this raises important questions. To begin with, if music, and generally Mozart's music, increases the IQ scores, could we also validly infer that musicians, or, perhaps, only Mozart performers, are more intelligent that the general population?

In a pertinent (albeit almost petty) criticism, John Linton asked himself rhetorically, "If Mozart's music were able to improve health, why was Mozart himself so frequently sick? If listening to Mozart's music increases intelligence and encourages spirituality, why aren't the world's smartest and most spiritual people Mozart specialists?" This is obviously a slightly abusive and destructive interrogative criticism, for we could just as well wonder in what way the music of the ever-sickly Mozart contributed to putting him back on his feet and imbuing him with an unparalleled creative power. And using the same reverse logic, there are many great mathematicians and physicists who are lifelong partisans of Mozart's music. Oftentimes, however, many so-called scientific assertions are unfortunately even more embraced and distorted by financial or publicity interests, or simply by unsubstantiated ambitions.

So, if such procedures have been proved successful in improving the communication skills, will they be enough to turn musicians into perfect rhetors? Are we henceforth going to recommend only the election of those politicians who have a sound musical knowledge? This, I believe, would disqualify almost the entire political class in our country or elsewhere.

There is a certain connection between the practice of music and the learning of foreign languages, which involves not only syntactic or lexical acquisitions, but also important phonological abilities. Musicians, by force of circumstances, do speak foreign languages, but is this not due rather to the social nature of the labor market that, for musicians, is highly globalized and international?

It is hard to decide, however, anything concerning the spatial-temporal perception and skills. In any case, many years of discipline and labor in coordinating physiological gestuality with the temporal and discursive aspects of sounds, will certainly result in a certain type of higher coordination. A good organist whose performance requires both independent and simultaneous coordination of their hands and feet should also make a good driver and even a sharp fighter pilot. Should we then recommend that fighter pilots include learning the organ in their training? To the best of our knowledge, there are no records or statistic data in this field. But Karajan was, indeed, an excellent car race and plane pilot.

The practice of musical art undoubtedly has important results for the mental and moral configuration of the subject–musician. Up to a certain age (i.e. before social pragmatism and the associated hypocrisy rear their heads) children musicians have a highly developed sense of value. They judge and swiftly classify a good performance as valuable, even if it is somebody else's. They almost without exception acknowledge other people's high performance with unfeigned sincerity.

In labor ethics too, the musician should be a paragon of consciousness. Sadly enough (or fortunately), there has been little evolution over the last couple of centuries in the learning and

acquisition of instrumental mastership. Usually even reaching musical mediocrity requires long, coordinated and conscious efforts. Let alone the higher levels of virtuosity requiring an almost inhuman amount of work and renouncement of almost all the shallow (albeit natural) joys of childhood and adolescence.

9. Instead of conclusions

We could certainly define today's meaning of the "Mozart Effect" syntagm as an unprecedented intertwining of some scientific (and often pseudoscientific) research findings and claims, with media or mercantile interests, all at a usually average and below-average intellectual level.

There are no controversies whatsoever as to the beneficial role of music in the development of human mind, the enhancement of intelligence, and in revealing the spiritual nuances and subtleties arising from the active or passive practice of this millenary art. During the past three millenniums, man, as a whole and as a cultural product, could hardly be conceived of outside the realm of music, although the art of sounds is only one important factor among other cultural factors. Likewise, the great mystical, religious, artistic and scientific traditions always include a more or less important musical component.

On the other hand, however, making uncontrolled assertions about the effect of music in general and about that of Mozart's music in particular is obviously an elementary mistake. And from statements like "cows are smarter and yield more milk if Mozart music is played to them" to the obligatory induction of spirituality and intellective abilities (through devices that automatically turn the in-utero fetus in a future Einstein) is a distance that most probably cannot be covered. Like most of humanity's major arts, music has certain uncontrollable segments pertaining to the individual's momentary mood, to the wide capacity of performance perception and musical expression valorization, along with a huge corpus of cheap and unsubstantiated legends, anecdotage and mysticism. As well as mystery and ineluctable ineffableness.

Mozart's music is one of the most complex artistic and spiritual universes ever created. And if music has indeed beneficial effects, is this also true about the tragic, pathetic, painful, complex and ineffable works? Mozart's music conveys pure joy and endless torment to the same extent. It can arouse the vital playful spirit, profound melancholy, confidence and despair, and can be filled, if we are willing to truly listen and understand, with an immense grief and pathos, or may even be thought of as a reason for suicide.

At the end of this study on the "Mozart Effect" phenomenon it is obvious that we have not discovered anything that wasn't already known from the great esoteric traditions, from the millennial tradition of the science of music and/or from various occasional (and unfortunately

rare) research studies that have been validated. We realize that the Mozart effect is a phenomenon that certainly deserves investigation. The results obtained so far are doubtful, inconclusive and debatable, to say the least. In addition, perhaps more importantly, we realize that we are faced with a phenomenon whose genuine complexity defies any simplistic and unprofessional approaches.

So much so, that even Mozart himself would probably conclude "much ado about nothing" with a smile, moving swiftly to compose a *Dorfwissenschaftlers* divertissement, to evoke Mozart's famous *Dorfmusikanten*.