Music's Influence on Human Behavior

Vitālijs Davidjuks

Bachelor Thesis
2013

Tomas Bata University in Zlín
Faculty of Humanities

Tomas Bata University in Zlín
Faculty of Humanities
Department of English and American Studies
Academic Year: 2012/2013

BACHELOR'S THESIS ASSIGNMENT

(PROJECT, ARTWORK, ARTISTIC PERFORMANCE)

Degree, First Name and Surname:	**Vitalijs DAVIDJUKS**
Personal Code:	**H10908**
Degree Programme:	**B7310 Philology**
Degree Course:	**English for Business Administration**
Thesis Topic:	**Music's Influence on Human Behavior**

Thesis Guidelines:

Study of specialized literature
Collection of research material
Formulation of hypothesis
Analysis of the material and testing of the hypothesis
Discussion of results and Conclusion

Thesis Extent:

Appendices:

Form of Thesis Elaboration: **printed/electronic**

Bibliography:

Arnett, Jeffrey. 1991. "Heavy Metal Music and Reckless Behavior among Adolescents." Journal of Youth and Adolescence, 20/6.
Bateman, Anthony, and John Bale. 2009. Sporting Sounds: Relationship Between Sport and Music. London: Routledge.
Dainow, Elliott. 1977. "Physical Effects and Motor Responses to Music." Journal of Research in Music Education 25/3.
Russel, Gordon W. 2008. "Aggression in the Sports World: A social psychological perspective." Oxford: Oxford University Press.
Goleman, Daniel. 2005. Emotional Intelligence: Why Can it Matter More than IQ. New York: Bantam Books.

Thesis Supervisor: **Mgr. Jana Vondřejcová**
Date Assigned: **30 November 2012**
Thesis Due: **3 May 2013**

Zlín, 1 February 2013

doc. Ing. Anežka Lengálová, Ph.D.
Dean

UNIVERZITA TOMÁŠE BATI VE ZLÍNĚ
Fakulta humanitních studií
L.S.

PhDr. Katarína Nemčoková, Ph.D.
Head of Department

Bachelor Thesis Author Statement

I hereby acknowledge that:

- Upon final submission of my Thesis, I agree with its publishing in accordance with Act No. 111/1998 Coll., on Higher Education Institutions and on Amendment and Supplement to Some Other Acts, (The Higher Education Act), without regard to the defence result;
- I approve of the release of my Bachelor Thesis in electronic form on the university information system, accessible for reading only;
- To my Bachelor Thesis fully applies Act No. 121/2000 Coll., on Author Proprietary Rights, as well as the Modification and Amendment of Other Acts (Author Proprietary Rights Act), connected to author's proprietary rights and their changes in later versions of legal directives, esp. Section 35 Para 3;
- In accordance with Section 60 Para 1 of the Author Proprietary Rights Act, TBU in Zlin is entitled to enter into a licence agreement about the use of the Thesis to the extent defined in Section 12 Para 4 of the Author Proprietary Rights Act;
- In accordance with Section 60 Para 2 and 3, I can use my Bachelor Thesis, or render the licence to its use, only with the prior expressed written agreement of TBU in Zlín, which is in such case entitled to require from me appropriate financial compensation to cover the cost of creating the Bachelor Thesis (up to the total sum);
- If the software provided by TBU or other entities was used only for study and research (non-commercial) purposes in the development of the Bachelor Thesis, it is not possible to use the Bachelor Thesis commercially.

I herewith declare that:

- The contents of the file handed over are identical with the printed copies;
- I have created this Bachelor Thesis on my own and cited all used sources. In case the results are published, I shall be cited as author.

In Zlín 02.05.2013 .....

date signature

Note: Relevant Czech legislation applied.

ABSTRAKT

Tato práce se zaměřuje na hudbu, aspekty jejího denního použití a vlivu na lidi. První část práce se zabývá mechanismy možného vlivu na fyziologii i psychiku člověka. Druhá část se zabývá stereotypním připojením k hard a heavy typu hudby, negativními dopady na člověka, kulturu a společnost jako celek. Poslední část se skládá z praktické analýzy názorů respondentů, kteří byli vyslýcháni v rámci zkoumání postojů obyčejných lidí vůči této otázce.

Klíčová slova:

Hudba, vliv, mozek, paměť, stres, pozornost, heavy metal, rock, emoce, bezohledné chování, agrese, sebevražda, osobnost

ABSTRACT

This work focuses on music, the aspects of its day-to-day use and its possible influence on people. The first part of the work examines mechanisms of possible influence on physiological levels as well as on psychological levels. The second part considers stereotypes attached to hard and heavy types of music and the negative impacts this music has on humans, culture, and society as a whole. The last part consists of the practical analysis of respondents' opinion, who were questioned in frames of examination of ordinary people's attitudes towards the issue.

Keywords:

Music, influence, brain, memory, stress, attention, heavy metal, rock, emotions, reckless behavior, aggression, suicide, personality

ACKNOWLEDGEMENTS

I want to sincerely thank my dear supervisor Mgr. Jana Vondřejcová for her prompt and objective criticism, advice, and support throughout the process of working on this thesis. Definitely, I want to say a big thanks to all the members of my family, especially those who neglected me for some time, thus arousing courage and perseverance in me. Special thanks to those teachers and lecturers who really helped in learning the language, making this very work eventually come true. I would like to express sincere gratitude to my friend Dagmar Pitrova for organizing a proofreading for me, and last but not least, I want to thank music for staying with me through all the good times and all the bad times.

CONTENTS

INTRODUCTION

"Writing about music is like dancing about architecture. It's a really stupid thing to want to do." (Elvis Costello).

Music and science represent two different worlds – one of beauty and emotion, the second, of logic and reason. This work tries to connect them together by examining music's beauty and emotion with logic and reason.

Music nowadays has become ubiquitous, it surrounds us everywhere. We can hear it from mobile phones, at public events and in public transport. This alone suggests analysis of its possible impacts on our lives. However, most of the respondents answering the question "does the music you are listening to influence your life in any way?" respond negatively stating "it's just music". On the other hand people like Eric Harris, Dylan Klebold, Luke Woodham, Michael Carneal, Kipland Kinkel, Rod Ferrel, and Richard Ramirez are well known for their crimes against humanity not only in America but in the whole world. Among elements what they all had in common prior to the actions that provided them fame was listening to heavy metal music (Holmberg 2004).

Stereotypically aggressive music like Heavy Metal is considered to have negative impact on its listeners. Usually it is said that music soothes the savage beast, but can it create one? To which extent does the music we are listening to have an affect on our decisions, actions, and shaping our personalities? Maybe it can be compared to a knife which is just a domestic tool used in everyday life but can also serve as a weapon for a murderer. Therefore, music is not simply an entertainment but a powerful instrument with primary impact on human behavior.

I. THEORY

1 MUSIC IN GENERAL

Even in ancient times it was known that sound vibrations (and, in particular, music) are capable of providing an effective therapeutic or pathogenic effect on the human body and psyche. Pythagoras, who among other flattering titles is sometimes called *the first musical therapist* created a technique of such therapy and successfully applied it. A special musical-medical center was built in the Parthian kingdom. On the other hand, one of the most feared punishments in the Middle Ages was considered *under the bell*, when the sentenced were placed under a large bell and it was banged into. Another frightening example of the use of sound, more precisely, the rhythmic oscillations, were widely known executions by dripping water somewhere near or right into the head of convicted (Siushkina 1999).

Music has an impact on several fronts simultaneously. Extremely low frequency rhythmic fluctuations manifest themselves in the rhythm (or pace) of music that is in the number of strokes or beats per minute. Thus, the rhythm of waltz is about 50-80 beats per minute, in other words, about 1 Hz. Music, designed for relaxation and meditation, has a much slower pace. Rock 'n' Roll and related musical forms have about 120 beats per minute, which is about 2 Hz. Apart from this, recently popularized electronic genres of music have the frequency of up to 240 strokes per minute, which is close to 4 Hz. This has detrimental impact directly on the brain and the gastrointestinal tract. Occupational diseases of considerable interest among pop musicians are stomach ulcers, which can possibly be related to music parameters discussed. This also affects the frequency of cardiovascular, immune and nervous systems.

Feelings occurring when listening to such music are similar to those which are caused by alcohol and drugs. As an example to this, in ancient times a common practice of *ritual intoxication* existed, which reminds the idea of many researchers that the music itself has the ritual origin. Archaic rhythms gradually are being revived in the modern musical genres and directions, but losing their original content at the same time. The result is that a man goes into a trance, but this is not followed properly by the original purpose of it. It would seem that there is a kind of dissonance between the physiological and psychological human' reactions to it (Ibid.).

1.1 Elements that constitute music

Understanding the effects of any substance must be based on the precise knowledge of particular elements that constitute it. This serves in identifying the effects they have on physiological functions and on psychological states.

These basic elements are as follows:

1. Rhythm. The element that has major influence on the body and emotions, can be further subdivided into tempo or speed and meter or grouping of beats.

The evidence on the connection between musical rhythm and rhythms of the body comes from musicologists, experimental psychologists, and neurologists, according to whom, human body has its own various rhythms: rhythm of respiration; of heart beat; various muscular movements; rhythm of activity and rest; and various bodily functions. Rhythm of music influences them all by harmonizing or disrupting, stimulating or calming them (Assagioli 1956).

Rhythms can be distinguished on the psychological level as well: the rhythms of elation and depression; alternations of sorrow and joy, of fervor and lassitude, of strength and weakness, of extraversion and introversion. All these rhythms interpenetrate and become one integral rhythm in times of dancing for instance.

2. Tone. Specific rate of physical vibration that has physical and psychological effects.

Being related to emotional perception asserted correlations varies from individual to individual.

3. Melody. A combination of various musical factors such as rhythm, tones and accents.

Melody on its own is the expression of composer's emotions which, not only arouses emotions in its listeners but also sensations, images and urges, influencing the nervous system. By this touching respiration and circulation, are basically all vital functions.

4. Harmony. It is a blending of several tones simultaneously sounding that form chords.

The way the rate of each particular tone relates to another defines whether the overall sound will be harmonious or dissonant.

5. Timbre is shaped by the type of musical instrument. Including human voice, special qualities of which are easily recognizable at the level of emotional responses to it (Ibid.).

It becomes clear that the main elements of music, first of all, have its impact on the emotional level of human psychology. This alone suggests that the perception and therefore the primary influences of music are rather subjective which makes it difficult to draw precise general conclusions.

1.2 Physiological reactions to music

Physiological motor reactions are "the most basic, earliest and most lasting reaction to music" (Van de Wall 1936, 57).

Music can markedly affect the bodily processes but due to the complexity of physical responses to musical stimuli it is hard to decide precisely on the quality and magnitude of these effects. Among aspects of physical response to music that have been studied, Dainow Elliot in his report of 1977, mentions the patellar reflex, the activity of the stomach, the pilomotor response, and the most commonly investigated physiological parameter the heart rate. However, the relationship between the latter and music is unclear. "All these studies give only meager support to the hypothesis contending that HR will "follow" the music, increasing in response to fast, and decreasing in response to slow music."(Elliott 1977, 3)

Although some researchers say that the respiration rate will increase with enjoyable music, most of them could not find changes in respiration rate and respiration amplitude (Ibid., 4).

Some authors emphasized that muscular tension or so called motor response to music is a direct reflection of the emotional state, therefore, study of them has to reflect the total response of the whole organism. Those can include a combination of tapping, nodding, swaying, moving the vocal chords, clapping, or stamping. However, mental inhibition of motor response as well as subjects' expectancies, and their attentiveness highly distort results of the studies. "It might be [only] expected that inherently tense music could induce a corresponding physical or muscular tension in the listener." (Ibid.)

1.3 Hormonal response

The human body has particular biochemical responses to music. It can be brought to a relaxed state by the decrease in release of neurotransmitter that arbitrates chemical communication in the sympathetic nervous system of the body. A significant decrease of,

norepinephrine levels was found in students that listened to preferred music. The research based on the EEGs showed that listening to music brings higher consciousness as opposed to silence: "Music may evoke more organized mental activities which result in subjectively comfortable feelings." (Heather 2009, 5)

A crucial role is played by the release of dopamine hormone that is known as an ancient reward system. Dopamine is being released each time we do something our brain wants us to do. With music it works when a person hears the same piece of music that he likes repeatedly. This fact provides a ground for comparison of music to good food or even drugs (Salimpoor 2009, *Discussion*, 11).

1.4 Emotional effects

"The fundamental purposes of hearing are to alert and to warn. As a result sound directly evokes emotions and actions." (Westman and Walters 1981, 1)

Emotions are not specified by events or other people but rather what the individual thinks about particular matters labels an emotion (Garling 86, 104). Emotion is especially influential in determining the state of an individual; however, it cannot be stated that the emotional experiences will directly influence or cause behavior. Therefore, an emotion is treated only as the first level of response (Ibid).

Emotional content of music is very subjective. Emotionally powerful piece of music is experienced in different ways by each person. In particular, an emotion created by a piece of music can be affected by:

1. The memories associated with the piece.
2. The environment it is being played in.
3. The mood of the person listening and their personality.
4. The culture they were brought up in.
5. Any number of factors both impossible to control and impossible to quantify.

Having so many variables in one equation makes it difficult to identify particular aspect of music that caused specific emotional response (Geetanjali Vaidya 2004, pt. 4).

It is suggested that sadness automatically slows the pulse, raises blood pressure and temperature of the body, and drops skin's conductivity. Assessment of the emotional arousal is widely achieved through measurements of galvanic skin response that is according to The Free Dictionary "a change in the ability of skin to conduct electricity,

caused by an emotional stimulus, such as fright." But the lack of standards in researches makes experiments inconclusive.

Happiness causes faster breathing, and fear increases heart rate. Monitoring these reactions, Carol Krumhansl of Cornell University concluded that music with a quick tempo in a major key brings happiness, whereas slow tempo and minor key – sadness (Leutwyler 2001, *From Mind's Eye to Emotion's Seat*).

Dissonance which is a harsh, disagreeable combination of tones used to provide the *spice* to the music is referred to as a characteristic of music that creates displeasure. It can consistently create unpleasantness, even if the piece of music is heard for the first time. Measuring the cerebral blood flow in a specific area of the brain while playing different types of music to the subjects, researchers have found that varying degrees of dissonance caused increased activity in the paralimbic cortex that plays critical role in the regulation of emotional processes (Vaidya 2004, 33). A typical illustration of the effect of dissonance is showed by 4 month old infants, who react negatively to it by squirming and turning away (Cromie 2001, 2).

1.5 Memory

Basic functions of human memory are encoding, consolidation, storing, and retrieving information (Mastin 2010, pt. 1). Retrieve of information or the recall of it is best when the information was encoded not on an *empty space* but in the context. Played music can provide an important contextual background that will be consequently used during the process of recall improving it. Numerous experiments prove that statement. In one of them subjects were divided into three groups where a list of words was displayed and two days later they were given a test in which they had to recall as many of the learned words as possible. Three different conditions for these groups were provided by different types of music. The first group listened to a Mozart piano concerto, the second to a jazz piece, and the third had a quiet background. During the recall test they were provided with either the same conditions or different ones from those presented during the learning process. Results showed that recall of data was the best when the musical background was the same throughout learning, rather than when it was changed. The silence did not help subject's memory in any way. The worst results in recall were obtained when the musical background was changed and it was found to be due to a memory process, rather than to possible distraction. The conclusion made on the experiment was that "music used as part

of learning, can enter into memory and aid recall even when it is not consciously attended to" (Smith 2002, 234).

1.6 Academic performance

Since music improves memory, it can be used to improve academic performance. Exploration of possible music usage in schools has found significant improvement in reading comprehension that was measured during the test with music played in the background. An increase in scores on the Nelson Silent Reading Tests was shown by 58 per cent of the 8th and 9th graders. Music in this case helped to increase accuracy, even students who usually had bad achievements benefited the most in the presence of music. This suggests that they are in need of an aid for concentration of attention. Studies also suggests that the greatest music's assistance was given during fatigue periods of the day (Hallam and Kotsopoulou 1998, 3).

According to the studies at Glassboro State College, music that was played in a psychology class improved academic performance, as it was suggested, by stimulating certain brain waves. Students that were exposed to twenty minutes each day had significantly higher scores on examinations in comparison to those who didn't listen to the music (Schreiber 1988, 5).

Similar research made on mentally handicapped students showed an increase in performance in mathematical disciplines (Ibid.).

The findings of a study made on emotionally and behaviorally disturbed children aged between 9 and 10 in London area showed that mood calming background music played in the classroom during math lessons helped pupils in concentration and had no detrimental effect on performance (Hallam and Kotsopoulou 1998, 4).

The same set of experiments conducted with 10 to 11 year old children without special educational needs and the same music showed considerably smaller effect provided by the background music. Study demonstrated enhances in the speed of working on mathematical problems, students got more problems correct but their overall accuracy was not affected (Ibid. 5).

However, study on post-graduate students with different levels of expertise in different areas, who were provided with logical reasoning test and different types of music that were described first as exciting and second as calming, revealed that the latter expressed

pleasure to the objects of test, whereas the arousing music was found to be very distracting (Ibid. 6).

A similar study conducted with 11-12 years old being divided into three different groups that were exposed to silence, calming, and aggressive music, and were provided with cognitive tasks also showed that calming music helped to improve the results, whereas results of the group with aggressive music was lower than the one that was exposed to silence (Ibid. 9).

An overall conclusion to all of these studies is that "the effects seem to be particularly marked in primary school children and those with emotional and behavioral difficulties. Whether there are any effects in the performance of adults still remains an open question." (Ibid.)

One of possible explanations to the impact of calming music on academic performance can be explained with the effect it has on people that are prone to worries. Daniel Goleman states that:

> "The more prone to worries a person is, the poorer his academic performance, no matter how measured grades on test grade point of average, or achievement tests. Good moods, while they last, enhance the ability to think flexibly and with more complexity, thus making it easier to find solutions to problems." (Goleman 1995, 83-85)

Therefore, if music is calming it can enhance the academic performance.

1.7 Music in teaching

Most songs consist of a melody or music and lyrics. In 1989 Tim Murphey was working on his Ph.D. dissertation on *Music and Verbal communication: The Use of Songs in TEFL*. According to his results, by using music, in particular songs chosen by the students themselves, teachers can connect English learning with the inner world of students, their concerns, their fun, and so on, which can be beneficial for the student's motivation in thinking, feeling and reacting. Another positive aspect is that the teacher shows his respect, tolerance and openness to the student that is accomplished through music is basically a common interest for both parts in the classroom. "Songs should not be viewed as a new methodology but rather extremely valuable tools which used even occasionally will have a salutary impact upon students." (Murphey 1989, 6)

1.8 The Mozart effect

There is a widespread belief that listening to music composed by Wolfgang Amadeus Mozart enhances intelligence of the listener. In the year 1993 scientific journal *Nature* has published a report entitled "Music and Spatial Task Performance", providing results of the examination of Mozart sonata effects on college students. According to the report, students who listened to sonata for 10 minutes had better performance in a spatial intelligence test by 8-9 IQ points than those who were listening to relaxing music or sat in silence for the same period of time. The same researchers, in particular Rausher, Robinson, & Jens, reported later that rats exposed to Mozart's music demonstrated better maze navigation performance. Consequently these findings became omnipresent in US culture, known as The Mozart's Effect which is perceived by the people and media as an "easy technique for enhancing intelligence" (Bargerter and Heath 2004, 609).

It was argued over the possible simple explanations of a phenomenon, such as the simple impact on a person's mood, or if it was a unique feature of Mozart's Music. According to the New Scientist's report, the team that worked on the effect hoped that the results would help them in designing music therapy for patients diagnosed with neurodegenerative diseases such as Alzheimer's (Singer 2004, 2).

According to the Bangerter and Heath it became a scientific legend which is to be defined as "a widespread belief that propagates in society, originally arising from scientific study, but that has been transformed to deviate in essential ways from the understanding of scientists" (Bangerter and Heath 2004, 609).

Based on the belief that Mozart's music enhances intelligence the state of Georgia passed a bill to distribute free classical music CDs to young mothers. The initiator of the bill was the governor of the state who commented on the arrangement that studies show listening to Mozart engages both hemispheres of the brain. Creativity and emotion of musical piece engage the right lobe, and rhythm and pitch engage the left, by this developing a bundle of nerves that connects those two halves (McNatt 1998, 1).

However, results of the reexamination of the effect by Wilson & Brown suggest that "listening to passages of repetitive relaxation music can also enhance spatial-task performance relative to silence" (Wilson & Brown 1997, 369). Therefore, results provide limited support for Mozart's effect and contrary to the conclusions of Rausher et al. (1993),

the data suggests that repetitive and lacking in complexity music enhances accuracy in spatial reasoning, in comparison to silence conditions (Ibid.).

The data obtained in frames of this study also suggest that discussed effect is not so powerful and not anyone can benefit from it. The expected result can only be obtained "under certain circumstances and to a certain point". Moreover, there are some temporal limitations to it (Ibid.). Therefore, it cannot be assumed that listening to Mozart's music, even if you do not like it, is beneficial for intelligence.

1.9 Music at work

Nowadays, during the working day music is played in many offices and working areas. It is possibly one of the most practical applications of music in daily life.

Robert Gifford in his book *Environmental Psychology: Principles and Practices* emphasizes the importance of physical environment at work. Among crucial factors that influence the environment first he mentions *sound*, which further is divided into *noise and music*. Desirable sound that is perceived as beautiful is *euphony* and the unwanted sound is *noise*. The difference among the two again depends on the individual and his personal attitude towards it. Sound that is noise for one person can be perceived as euphony by the other but as the source of sound becomes more relevant to an employee, as its controllability and predictability decrease, sound is more likely to be perceived as noise and to negatively affect work behavior (Gifford 2002, 341-342).

The way noise affects actual productivity is unclear "many researchers *believe* [Gifford's italics] that noise interferes with performance, but the evidence itself is contradictory, In fact, noise occasionally has even been shown to improve performance" (Ibid. 342).

The author provides three conclusions based on several studies:

1. Performance is not affected by noise.
2. Performance is affected by noise.
3. Performance is affected but in the opposite-from-expected direction.

Noise can sometimes improve the performance of simple tasks. The performance of manual labor was found not to be affected by the noise, but employees themselves believe they are working harder. The worst effects provided by noise are believed to take place in open-plan offices where it distracts concentration on various tasks at a moment (Ibid. 344).

As to the music, there is widespread belief that music can speed up production or slow it down. A fair number of researchers show that music improves productivity, but the research was mainly done on simple, repetitive tasks, and when it came to analyzing a vast variety of tasks at work, in combination to different types of music, its tempos and volumes, a general conclusion cannot be made. However, most of the employees themselves like music at work and believe that it increases their productivity (Ibid.).

1.10 Stress reducing

As it was already mentioned, music can reduce stress. The calming or relaxing power of music was given credit to by the researchers at the University of Leicester in UK for helping cows to yield more milk. Dr Adrian North comments on the effect by saying that it is most likely that the effect of reducing stress provided by music comes into power. The experiment conducted showed that slow music played to cows each day increases yield by at least 3 per cent for each cow. "We found that slow music improved milk yields perhaps because it relaxes the cows in much the same way as it relaxes humans." (BBC 2001)

Apart from cows, there are categories of people that are in great need for an instrument for decreasing their level of stress. Patients diagnosed with coronary heart disease commonly suffer from severe distress. This puts a greater risk for complications of the disease or even sudden death. Among other measures, music was used to reduce distress and anxiety and improve physiological functioning in patients.

Results were marked to have a moderate effect on anxiety, however inconsistent across the analysis. Listening to music is beneficial for heart rate and blood pressure for those having coronary heart disease. It can reduce anxiety in myocardial patients, but not for those undergoing cardiac procedures. It reduces pain and respiratory rate but the magnitude of the effects is small, therefore, its clinical importance is unclear. It was not found to have impact on heart rate variability, peripheral skin temperature, and depression. According to researchers more examination is needed for its influence on mood. But the overall conclusion is that "music listening may have a beneficial effect for people with coronary heart disease" (Bradt and Dileo 2009, 14).

Obviously, not each type of music can provide relaxation; therefore particular styles of it must be determined.

A study conducted under the supervision of Elise Labbe, has evaluated the impacts of different types of music, including heavy metal that will be discussed here later. A group

of researchers hypothesized that classical and self-selected music should reduce anxiety, anger, and sympathetic nervous system arousal, and should have increased relaxation impact in contrast to heavy metal or silence. Fifty-six students attended the experiments, significantly to notice that majority of them were females (15 males, and 41 female). Participants were "assigned to self-selected, classical, or heavy metal music conditions or silence" (Labbe et al. 2009, 165). They were provided with mentally challenging task, then had to complete the state anxiety and anger scales and Relaxation Rating Scale. After this, subjects listened to music for 20 min, and again were provided the aforementioned level measuring tests.

Results of the study confirm the thesis, moreover it was revealed that those who listened to heavy metal not only experienced greater levels of anxiety, but were even more anxious after listening to heavy metal (Ibid.).

It must be noticed that participants in the latter group were basically pushed to listen to music they might not like themselves, which certainly provides different emotional responses in their brains as it was already mentioned in the chapter *Emotional Effect*s. On the contrary, other participants were asked to bring their own favorite music. This fact makes it possible to compare the heavy metal group to being exposed to torture with music, which is to be considered in the following chapters.

Heavy metal is commonly referred to as a male music (Weinstein 30, 294), and as it is clear from the settings of the study – most participants were females.

Therefore, conclusions on self-preferred music are to be viewed as reasonable, but the study cannot be considered as having proven the negative impact on relaxation with heavy metal music.

2 HEAVY METAL

Commonly the heavy metal genre of music is described as a genre of rock music that developed in the 1960s, with roots in psychedelic rock and blues rock, characterized by a thick massive sound, distorted guitars, emphatic beats and overall loudness. Lyrics and performance are associated with masculinity (Fast 2005, 89-91; Weinstein 2000, 14).

Rock is loud, aggressive, mesmerizing, rhythmic, and energetic music. The desire of young people, who usually constitute the main musical audience, to listen to and enjoy this music is clear since it corresponds to the psycho-physiological and psychological characteristics of children. Adolescence is also characterized by a need for intensive communication with peers. Being together at concerts, massive crowd's singings of favorite songs, strong and rhythmic movements, a state of euphoria and a huge splash of adrenaline contribute to the needs of adolescents in strong experiences and surge of emotion.

Rock is for non-conformist, declaring the opposition to be recreational, commercial music and in general, *smug* way of life, the denial of all and any rules. Rock is a special form of art. It combines music, theater, folk festival, etc. This is a special form of direct contact between the performers and the audience (Telepov 2006, 1).

2.1 Reckless Behavior

Adolescence is characterized by the need for intense physical and psychological stress, so modern music, especially rock music, contributes to the realization of this need.

Stereotypically, listeners of Heavy Metal are often associated with rebellic behavior. Jeffrey Arnett in his article *HM Music and Reckless Behavior among Adolescents* examines number of studies on that topic. He provides a number of variables that help in understanding of rebellic behavior. In particular, major elements that were measured are the following: driving behavior, sexual behavior and drug abuse (various kinds of reckless behavior that can be called as rebellic). Questions that were asked in his own study are as follows:

1. Are adolescents who like HM music more likely than their peers to engage in reckless behavior?

Musical critics usually argue that the lyrical content of considered music is the factor that promotes aggressive and antisocial behavior.

2. Are they more likely to be high in sensation seeking?

Special characteristics of Hard and Heavy music such as distorted guitars sounds, relentless rhythms, and screamed rather than sung lyrics, makes it unpleasant for people that do not have unusually high capacity for sensation.

3. Are they troubled in their social relationships, with family, peers, and with regard to dating and sexuality?

If people have the aforementioned, they can be attracted to this type of music looking for an automatic membership in a social group.

4. Is self-esteem lower among adolescents who like heavy metal music?

The alienation, cynicism, and misogyny of some heavy metal songs can attract people with low self-esteem.

5. Does the pattern of results differ for boys as compared to girls?

Males generally have higher propensity for sensation seeking, and misogyny in lyrics may mean that females listening to this music are different from males in distinct ways (Arnett 1991, 3).

Results obtained showed that HM listeners are in fact aggressive drivers, most of them are as well promiscuous and drugs abused, but this study didn't answer a main question what is cause and what is effect. In other words "does listening to heavy metal music cause or lead to reckless behavior, or are already reckless adolescents more likely to be attracted to the music?" (Ibid. 15).

The strongest link between reckless behavior and HM is sensation seeking. Author concludes that "it would be a mistake to conclude that HM causes the problems to which it was found to be related in this study" (Ibid. 18).

The relationship between heavy metal and reckless behavior is explained with sensation seeking. Thus, considered music is not the cause but merely the soundtrack of reckless behavior in adolescence.

2.2 Aggression

A common knowledge is that heavy metal music is one of the most aggressive types of music.

"As Americans, we tend to associate rock music or heavy metal music with aggression, in almost a positive way." (Holmberg 2004) Aggressive music may create negative and antisocial behaviors which could in return lead to destructive social behaviors (Stratton & Zalanowski 1997, 130).

Results of the five experiments, conducted in Washington under supervision of Craig A. Anderson, show that violent songs led to more aggressive interpretations to ambiguously aggressive words increased the relative speed with which people read aggressive vs. nonaggressive words and increased the proportion of word fragments that were filled in to make hostility without provocation or threat. It doesn't depend on music style, special artist and so on. According to Anderson, even humorous violent songs increase hostile feelings. "Aggressive thoughts can influence perceptions of ongoing social interactions, coloring them with an aggressive tint. Such aggression-biased interpretations can, in turn, instigate a more aggressive response -verbal or physical - than would have been emitted in a nonbiased state, thus provoking an aggressive escalatory spiral of antisocial exchanges," says Anderson. He then compares the influence of aggressive media with smoking habits and its possible consequences by saying that:

> "The 14-years-old boy arguing that he has played violent video games for years and has not ever killed anybody is absolutely correct in rejecting the extreme "necessary and sufficient" position, as is the 45-years-old two-pack-a-day cigarette smoker who notes that he still does not have lung cancer. But both are wrong in inferring that their exposure to their respective risk factors (violent media, cigarettes) has not casually increased the likelihood that they and people around them will one day suffer the consequences of that risky behavior." (Anderson and Carnagey 2003).

However, in conclusion it is mentioned only that "the content matters" and more research is needed to identify the short-term and long-term effects of violent song lyrics for it is possible that the effects of violent songs may only last a short time. Therefore, these experiments cannot serve as consistent proof that Heavy Metal music alone can serve as the main reason in creating an aggressive personality.

2.3 Lyrical content

As it was already mentioned, songs usually consist of melodies that make music and lyrics. The lyrical content is usually considered to be the main evil in heavy metal. "The lyrics themselves seem to be the primary agent acting on the behavior." (Mast and McAndrew 2011)

Rock musicians in general quite often address *difficult* and *negative* topics in their songs' lyrics. Some examples of negative texts include drug use, rape, pornography, hate, violence, sadism and many others. On the other hand vast majority of rock songs in reality

can educate through its allegorical or historical content. Rock musicians are among those few that raise questions encompassing social and political problems which can make its listeners think about the current situation they are in. Music gives the opportunity to express different ideas, concepts, emotions, and literature styles. Even if the song is aggressive it should not be always perceived as a call for the similar action. It should provide additional ideas for analysis stimulate the mind and inspire creativity by providing a view on the situation from the flip side.

Music is a channel for communication with society and within society. It does not only provide communication for musicians, it can also help to facilitate communication among people who may have difficulty expressing themselves altogether. It is a tool for those that have no voice in society. It serves its social role in society by connecting individuals with common interests.

Although it must be admitted that this type of lyrics can be dangerous for children and teenagers due to not entirely developed cognitive abilities or experiences for establishing comparisons against the negative ideas expressed. This only proves the necessity for having good supervisors in the face of parents and teachers who will support or provide additional explanations to the issues discussed.

The extent to which a person can be misled by negative lyrics is dependent on first of all the age, mental/physical maturity, psychological profile, mental state, and emotional stability. Apart from the internal factors that determine the impact on personality, external ones are represented by presentation and delivery of lyrics; weight of influence of the performer; peer pressure; popular trends and so on. In fact there is a vast majority of variables that can be mentioned in relation to this which makes it simply impossible to predict its possible impact.

According to James Kennaway the idea of heavy metal as a form of lethal brainwashing entered the public imagination after the parents of two teenagers who shot themselves in 1985 blamed Judas Priest band by claiming that satanic incantations are revealed when the music is played backwards (Kennaway 2011, 13). The "academic sociological and psychological research on the relationship between teenage alienation, musical subcultures and suicide is continuing, but beyond a right-wing fringe the idea of satanic heavy metal musical brainwashing is no longer widely accepted" (Ibid.).

Heavy metal was an easy target partly because of the use of satanic iconography and rhetoric in the genre, a means of provoking parents and society as well as asserting

masculine power for an audience of alienated teenagers uncertain of their identity. Those who led the attack on heavy metal as a form of satanic brainwashing drew on the automatic response theories of musical hypnotism. For instance, Carl Raschke's 1990 *Painted Black: From Drug Killings to Heavy Metal*, one of many books to link heavy metal and the threat of Satanism and even ritual murder.

Undoubtedly media has a huge impact on forming the perceptions in society, and it would be absurd to claim that it have no impact on shaping behavior at all, but it would be also inappropriate to blame solely music as having the main impact when there is a lack of parental involvement, insufficient education, limited economical opportunities, and many others. Obviously all these factors taken together can play role in reshaping personality.

2.4 Suicide risk

According to Lacourse et al. crucial factors playing a role in establishing suicidal ideation is played by poor family relationships, depression, feelings of alienation, anomie, and drug abuse. Apart from this, media has also been said to play its role in such behavior (Lacourse et al. 2000, 322).

Adolescent's musical preferences were under the constant attention of health professionals and adults since the creation of rock and roll, due to the topics referred to in its lyrical content. Sex, drugs, suicide, deviance, Satanism etc. are among the most frequent in hard and heavy music especially in its extreme genres like death and black metal which titles already speak of themselves. Marilyn Manson's music was put into consideration as a possible cause-effect since the Colorado shooting in April 1999 (Ibid. 322).

Lester and Whipple (1996) have criticized conclusions made by Stack et al. in 1994, who claimed that music may nurture the suicidal tendencies in specific subcultures, because of their study made on college students which did not show a relationship between current suicidal ideation or depression and heavy metal. They suggest that HM does not nurture current suicidal ideation; however a link between past suicidal ideation and preference for HM was found and explained by the pursuit of vicarious release in music and its positive impact on reducing negative emotions and suicidal thoughts (Ibid.).

Much of the ideation of suicide can be explained with copycat suicide or so-called "Werther effect". It is rooted in Johann von Goethe novel from 1774 *Die leiden des jungen Werthers (The Sorrows of Young Werther)*. Protagonist of the novel, named Werther, commits suicide. Apart from immediate fame provided to Goethe, the book also sparked a

wave of similar to the described in the book suicides across Europe. The effect of the novel was so strong that it was consequently banned in several countries (Cialdini 1993, 145).

The more or less modern-day Werther effect was found by examining the suicide statistics in United States in the years 1947-1968. The connection was found in publishing suicide stories on front-page in media and later the average of 58 more people than usual committed suicide. The same tendency was found in those parts of the country where the first suicide in a series was highly publicized in the media, consequently followed by the number of others (Ibid. 146).

This leads to a conclusion that society would benefit if, topics like this became a taboo and would not be at all discussed not in the media, nor in any type of music.

2.5 Stopped anapestic beat

Special musical patterns that can be found in any musical styles are said to have an impact on the human body through possible intervention or support of previously mentioned rhythms of the human body. Baroque music is often considered to have positive effect on abilities to concentrate attention due to its sixty beats per minute rhythmical pattern that has a relaxing effect on heart pulse. When the body is relaxed it is easier for the mind to concentrate. (O'Donnell 1999) Whereas the "end result' of listening to heavy metal 'is to erode the nervous system with noise, as drugs destroy the cerebrum" (Raschke 1990).

A startling discovery using applied kinesiology has shown that muscles would strengthen or weaken in the presence of positive or negative physical, emotional and intellectual stimuli respectively. Applying this method has helped to identify a pattern of the rhythm, that was called the *stopped anapestic beat*. The best illustration of which can be found in the beginning of famous *Queen*'s song *We Will Rock You*. The presence of this pattern in music causes *switching of the brain* when the symmetry between both hemispheres of the brain is destroyed, which causes stress to the body, lessened work performance, learning and behavior problems in children, and general malaise in adults (Diamond 1979).

"Virtually all classical music and most pop music (including "classical" rock and roll) caused universally strong response, Hard and Heavy produced universally weak response." (Hawkins 1995, 5)

This study did not receive firm, objective criticism from scholars so far. However, it must be clear that not each song that belongs to style of heavy metal of music contains this

pattern. Moreover, there is no clear evidence that this pattern belongs solely to heavy metal music.

Therefore, the general conclusion on the negative consequences of listening to heavy metal because of stopped anapestic beat cannot be made.

2.6 IQ studies

IQ tests are considered as having the ability to show levels of person's intelligence.

Virgil Griffith in his PhD work compared the data from SAT exams of 1,352 school's students with their favorite music. This study revealed that those who prefer classical music, in particular Beethoven's, have the highest grades in contrast to RAP music that were ranked as the least intelligent in this study. Rock and heavy metal music fans were found to be in the average and above average group (Griffith 2009).

In addition to this, stereotypically, students that are gifted and talented, who spend a lot of time reading, listens to classical music. However, the evidence provided by researchers under the supervision of Stuart Cadwallader at the University of Warwick in 2007 found out that heavy metal music is used by many teenagers to cope with stress associated with being talented. The head of the project said that it is likely that gifted people experience more pressure and use extreme music to work out anger and frustrations.

Both studies do not show causation instead only correlation, thus providing an understanding of a current situation on music market.

2.7 The effects of singing

Crowd singing is the typical event at each rock concert. The evidence that comes from psychologists suggests that singing is beneficial for health.

Singing raises the level of antibodies produced by the body. Using cotton swabs for collecting saliva from the mouths of choristers, who were singing Beethoven pieces. Researchers of the University of California at Irwin have found out that the level of immunoglobulin A, that is used by the body’s immune system to fight off disease, had gone up dramatically. Professor Robert Beck and Dr. Tom Cesario pointed out that "secretory immunoglobulin protein is associated with emotional arousal and mood, relaxation and sense of humor. If singing leads to higher levels of IgA, then it beneficial to your health as we know that heightened levels of this protein are effective in the immune

system. Singing releases endorphins, it alters your breathing, it stimulates the nerves behind the stomach" (Smith 2004, 169).

2.8 Environmental impact

Music's influence is being tested not solely on humans or animals. Some scholars try to identify possible impact of music on plants.

Almost ludicrous evidence comes from TV gardener Chris Brown who had students wanting to write a dissertation on the effects of music on plants. A curious experiment in which, the gardeners played Black Sabbath's music for flowers of one green house, classical music for the second, Cliff Richard's songs to the third, and the last one remained silent. The conclusion based on an experiment was formulated as: "if you really want the best blooms, you should blast them with heavy metal music." (Daily Mail 2013) Flowers that had Black Sabbath's music were the shortest, but had the best flowers and the best resistance to pest and disease whereas those that had Cliff Richard's background "all died" (Ibid.).

2.9 Music tortures

Music is harmful to the human psyche when, the person is exposed to it by force and does not like this music or its volume.

Music, more innocent than heavy metal can be used as a weapon by US intelligence services. Detainees at Guantanamo Bay and Abu Ghraib are tortured with music including the music from children television shows such as Sesame Street.

"It is music's capacity to take over your mind and invade your inner experience that makes it so terrifying as a potential weapon" says Thomas Keenan, the director of the Human Right's Project at Bard College (Al Jazeera 2012).

Mozzam Begg who was imprisoned in Guantanamo Bay says that "it was probably some of the worst torture that they [detainees] faced" (Ibid.).

II. ANALYSIS

3 THE RESEARCH

The practical part of this work was made of personal research in the discussed field that was accomplished by a questionnaire provided to 30 people of different age and cultural backgrounds. The expected conclusion was to find out that people in general personally do not take music seriously and do not expect it to have an influence on their lives and behaviors.

Questions that were asked aimed at learning certain musical background of the respondents, and to identify their personal opinion about the considered topic.

3.1 Questionnaire and answers

1). How often do you listen to music?

1. 63% – whenever I hear it on the radio, public transport and so on.
2. 33% - I always have headphines with me.

Asking this question helps to identify a person's particular relationships with music. It would be logical to presume that a person who listens to music quite often is more exposed to its influence then somebody who listens to music rarely.

2). What style of music do you prefer?

1. 44% - Rock and its branches
2. 33% - Everything
3. 23% - Everything emotional and with the meaning

This question identifies what kind genres are the most popular among participants of the study, by this providing evidence on the possible negative or positive impact of music.

3). Do you think that music affects the personality?

1. 61% - Yes
2. 22% - Insignificantly

3. 17% - No

4). Have your preferences in music ever been changed? At what age did it happen and why?

1. 60% - Yes, and the average age among the answered – 15.4
2. 22% - No
3. 16% - They constantly change

5). Do you use the background music during mental activities?

1. 35% - Radio plays at work
2. 65% - No

6). What feelings can music evoke in you (sadness, sorrow, joy, enthusiasm, euphoria, frustration, dissatisfaction with this world, anger, irritation, etc.)?

1. 75% - Enthusiasm, joy, sadness
2. 25% - Irritation, frustration

This question in conjunction with the one that identifies musical preferences aimed at establishing possible emotional response listener's experience.

7). Do you pay attention to the lyrical content of the song?

1. 67% - Yes
2. 33% - Sometimes and never

Answers to this question reflect possibility to be influenced by lyrical content.

8). Do you think that music can bring to suicide?

1. 74% - No
2. 26% - It can help in thinking about it

9). Do you visit musical concerts? If yes how often?

1. 62% - Yes, as often as possible
2. 38% - Sometimes and never

10) What is your age?

The age of the respondents varies from 17 to 47 years.

3.2 Discussion

As it was expected, the analysis of the data received confirms the proposal that was imposed as a thesis statement to the research. Most of the respondents believe that music is just music and it cannot affect their behavior even if a significant part of their wardrobe consists of clothes with special symbols, logos, and pictures of celebrities from the music business of any kind. That does not correspond to opinions of most of the psychologists and people that study the related aspect of human life on a scientific basis according to which music has its impact on human life and behavior.

People who do not listen to music often do not receive any impact of it. Usually they are listening to the radio. Music they hear belongs to different musical genres, it contains different topics in its lyrics and rhythmical patterns are changing from one song to another. Therefore, since music has a rather short-term impact on us, the possible effect of music can be neglected.

CONCLUSION

Based on the theoretical materials used in this work music cannot be considered in general as a main and paramount factor in possibly shaping or reshaping the identity. However, the potential of music as an auxiliary factor in conjunction with others that may affect the individual such as a social position in society, social inclusion, family relationships, etc. should not be underestimated. Based on the fact that the impact is produced on a multi-level, i.e. carried out on several channels such as physiological, emotional, and hormonal, the end result can potentially be dangerous but only in the short-term perspective. The exact scale of this potential cannot be determined in a general case since the perception of music is purely subjective for each individual. There is no possibility to take into account the full range of secondary factors affecting the perception of music and its shaping of someone's personality at the same time.

BIBLIOGRAPHY

Books:

Cialdini Robert. 1993. *Influence: The Psychology of Persuasion.* New York: William Morrow.

Diamond, J. 1979. *Your body doesn't lie*. New York: Warner Books.

Garling, Tommy. 1993. *Behavior and Environment*. New York: North-Holland.

Gifford, Robert. 2002. *Environmental Psychology: Principles and Practices*. Colville: Optimal Books.

Goleman, Daniel. 1995. *Emotional Intelligence: Why It Can Matter More Than IQ*. New York: Bloomsbury Publishing.

Hawkins, D. 1995. *Power v. Force*. Carlsbad: Veritas Publishing.

Murphey, Tim. 1989. *Songs and Music*. Oxford: Oxford University Press.

Raschke, Carl. 1990. *Painted Black: From Drug Killings to Heavy Metal: The Alarming True Story of How Satanism is Terrorizing Our Communities*. San Jose: Harper Collins Publishers.

Smith, Alistair. 2002. *The Brain's Behind it*. Bodmin, Cornwall: Mpg Books.

Web sites:

Griffith, Luke. 2009. "Music that Makes You Dumb." Accessed January 12, 2013. http://musicthatmakesyoudumb.virgil.gr/

Mastin, Luke. 2010. "The Human Memory." Last modified 2010. http://www.human-memory.net/processes_recall.html

Articles published online:

Al Jazeera. 2012."Songs of War." *Al Jazeera*. May 30 2012. Accessed April 29, 2013. http://www.aljazeera.com/programmes/aljazeeraworld/2012/05/201253072152430549.html

Anderson, C., and Nicholas L. Carnagey. 2003. "Exposure to Violent Media: The Effects of Songs with Violent Lyrics on Aggressive Thoughts and Feelings." *Journal of Personality and Social Psychology* 84, 5. Accessed April 23, 2013. http://www.apa.org/news/press/releases/2003/05/violent-songs.aspx

Arnett, Jeffrey. 1990. "Heavy Metal Music and Reckless Behavior Among Adolescents." *Journal of Youth and Adolescence* 20, 6, 1991. Accessed November 8, 2012, http://link.springer.com/article/10.1007/BF01537363

Assagioli, Roberto. 1956. "Music as a Cause of Disease and as a Healing Agent," *Psychosynthesis Research Foundation* 5. Accessed April 13, 2013. http://www.psykosyntese.dk/a-188/

BBC News. 2001. "Sweet Music for Milking." *BBC*, June 26. Accessed April 26, 2013. http://news.bbc.co.uk/2/hi/science/nature/1408434.stm

Bangerter, Adrian and Chip Heath. 2004. "The Mozart effect: Tracking the evolution of a scientific legend." *British Journal of Social Psychology* 43, 2004. Accessed April 12, 2013. DOI: 10.1348/0144666042565353

Bradt, J., and Dileo, C. 2009. "Music for stress and anxiety reduction in coronary heart disease patients." *The Cochrane Library* 2. Accessed April 20, 2013. http://www.drexel.edu/~/media/Files/artsTherapies/CardiacReview_Bradt.ashx

Cromie, William J. 2002. "Music on the brain." *Harvard University Gazette*. Accessed April 13, 2013. http://www.news.harvard.edu/gazette/2001/03.22/04-music.html

Dainow, Elliott. 1977. "Physical Effects and Motor Responses to Music." *Journal of Research in Music Education* 25: 211-3. Accessed February 19, 2013. DOI: 10.2307/3345305

Geetanjali, Vaidya. 2004. "Music Emotion and the Brain." *Serendip*. Accessed April 12, 2013. http://serendip.brynmawr.edu/bb/neuro/neuro04/web2/gvaidya.html

Heather, Simon. [2007?]. *Scientific Research into the Effects of Music*. Accessed April 1, 2013. http://www.simonheather.co.uk/pages/chapters/thehealingpowerofmusic_sample.pdf

Kennaway, James. 2011. "Musical Hypnosis: Sound and Selfhood from Mesmerism to Brainwashing." *Social History of Medicine* 25 (2012): 271-289. Accessed November 26, 2012. doi: 10.1093/shm/hkr143.

Labbe, E., Nicholas Smidt, Jonathan Babin, and Martha Pharr. 2007. "Coping with Stress: The Effectiveness of Different Types of Music." *Springer Science+Business Media.* Accessed April 10, 2013. DOI 10.1007/s10484-007-9043-9

Lacourse, E., Michel Claes, and Martine Villeneuve. 2000. "Heavy Metal and Adolescent Suicidal Risk." *Journal of Youth and Adolescence*, 30, 3, 2001. Accessed March 8, 2013. http://link.springer.com/article/10.1023/A%3A1010492128537#page-1

Leutwyler, Kristin. 2001. "Exploring the Musical Brain." *Scientific American*. Accessed April 13, 2013. http://cogweb.ucla.edu/ep/Music_Leutwyler_01.html

Mast, John F. and Francis T. McAndrew. 2011. "Violent Lyrics in Heavy Metal Music Can Increase Aggression in Males." *North American Journal of Psychology* 13 (2011):1. Accessed April 17, 2013. http://www.questia.com/library/1G1-249058082/violent-lyrics-in-heavy-metal-music-can-increase-aggression

McNatt, Glenn. 1998. "Tuning in to brain development Music: The music-loving governor of Georgia is providing every newborn in his state with a CD of classical music." *The Baltimore Sun*. July 06, 1998. Accessed April 24, 2013. http://articles.baltimoresun.com/1998-07-06/features/1998187011_1_brain-development-georgia-hospitals-listening-to-classical

Salimpoor, V., Mitchel Benovoy, Gregory Longo,Jeremy R. Cooperstock, and Robert J. Zatorre. 2009. "The Rewarding Aspects of Music Listening Are Related to Degree of Emotional Arousal." *PLoS ONE* 4 (10): e7487. Accessed April 13, 2013. doi:10.1371/journal.pone.0007487.

Schreiber, Elliot H. 1988. "Influence of Music on College Students' Achievement." *Perceptual and Motor Skills* 66 (1988): 338-338. Accessed April 13, 2013. doi: 10.2466/pms.1988.66.1.338.

Singer, Emily. 2004. "Molecular basis for Mozart Effect Revealed." *New Scientist*, April 23. Accessed April 24, 2013. http://www.newscientist.com/article/dn4918

Telepov, Alexander. 2006. "Rock Culture as Orientation Guide for Youth." *Development of Personality*, 3. Accessed April 15, 2013. http://rl-online.ru/articles/rl03_06/561.html

The Daily Mail. 2013. "A blast of heavy metal 'boosts blooms': Study finds plants that listened to Black Sabbath had the best flowers (but those that listened to Cliff Richard all died)." *The Daily Mail*. April 18, 2013. Accessed April 23. http://www.dailymail.co.uk/news/article-2311386/Study-Plants-listened-Black-Sabbath-best-flowers-listened-Cliff-Richard-died.html#ixzz2RGzmpDCJ

Westman J. and James R. Walters. 1981. "Noise and Stress: A comprehensive Approach." *US National Library of Medicine*. Accessed April 11, 2013. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1568850/,

Wilson, T., and Tina L.Brown. 1997. "Reexamination of the Effect of Mozart's Music on Spatial-Task Performance." *The Journal of Psychology*, 13, 4, 365-370. Accessed April 23, 2013. http://www.personal.psu.edu/faculty/a/c/acp103/PSYCH105/Mozart%20Effect%20Article.pdf

Video online:

Holmberg, Erick. 2004. *Hell's Bells 2: The Power and Spirit of Popular Music.* Reel 2 Real Ministries.
Accessed December 12, 2012.
http://vk.com/video1256796_163629555

Paper presented at a conference:

Hallam, Sue, and Anastasia Kotsopoulou. "The effects of background music on learning, performance and behavior." Paper presented in Conference of the Society for Research in Psychology of Music and Music Education, Sheffi eld. 1998.

Siushkina, Sophia. "Differences in human perception of music in the built and natural environment." Presented in Siegel Readings, *On the impact of music on people*, 1999. Accessed April 15, 2013. http://webcache.googleusercontent.com/search?q=cache:kex6ENzjnnUJ:muzika-live.narod.ru/vliyan_muz/o_vozdeistvii_muziki_na_cheloveka.doc+&cd=1&hl=en&ct=clnk