



Music influence in case of anxiety

Edgars Zinovjevs

BACHELOR'S THESIS
May 2022

Degree Programme in Media and Arts

ABSTRACT

Tampereen ammattikorkeakoulu
Tampere University of Applied Sciences
Degree Programme in Media and Arts

ZINOVJEVS, EDGARS:
Music influence in case of anxiety

Bachelor's thesis 45 pages
May 2022

Humanity nowadays is more than ever facing health issues related to stress. Current situation with stress disorders is forcing people with anxiety to look for new alternatives other than pills. The aim of this study was to investigate the influence of music on human beings from cultural, psychological and physical perspectives to pinpoint the significance of it.

All the information from books, articles, research cases were gathered to achieve a clear vision of music therapy and how it can be valuable in case of stress disorders such as an anxiety.

Current literature research shows beneficial influence of the music on mental and physical well-being and verifies that it can be used as a non-pharmacological intervention.

Music should be considered more seriously as a beneficial tool, a medium of intervention, a trigger that can change our behavior, and improve physical and emotional states, and create possibilities to connect to our inner world and people around us.

Key words: stress, anxiety, depression, music therapy

CONTENTS

1	INTRODUCTION	5
2	MUSIC AS A SOCIAL PHENOMENON	7
	2.1 Roots of the music	8
	2.2 Cultural influence of the music	9
	2.3 Religion and spirituality	11
	2.4 Music as “Universal language”	13
	2.5 Rhythm of the life	14
3	PSYCHOLOGICAL INFLUENCE OF THE MUSIC	18
	3.1 Emotional responses.....	18
	3.2 Psychological mechanisms by which music produces emotions.....	19
4	PHYSICAL INFLUENCE OF THE MUSIC	21
	4.1 Perception of the sound	22
	4.2 Changes in nervous system.....	23
	4.3 The effects of music on the brain functionality	25
5	MUSIC THERAPY AND ANXIETY.....	28
	5.1 Anxiety	29
	5.2 Practices of music therapy.....	31
	5.2.1 Active music making.....	34
	5.2.2 Passive music therapy.....	36
	5.3 Clinical benefits of music therapy.....	37
	5.3.1 Stimulative music.....	38
	5.3.2 Sedative music	38
6	DISCUSSION	40
	REFERENCES	42

GLOSSARY or ABBREVIATIONS AND TERMS (choose one or other)

TAMK	Tampere University of Applied Sciences
cr	credit
Affect	This term is used as an umbrella term that covers all evaluative – or “valanced” (positive/negative) – states (e.g., emotion, mood, preference). The term denotes such phenomena in general. If that is not intended, a more precise term (e.g., emotion, preference) is used.
Emotion	This term is used to refer to a quite brief but intense affective reaction that usually involves several sub-components – subjective feeling, physiological arousal, expression, action tendency, and regulation – that are more or less “synchronized”. Emotions focus on specific “objects” and last minutes to a few hours (e.g., happiness, sadness).
Mood	This term is used to denote such affective states that are lower in intensity than emotions, that do not have a clear “object”, and that are much longer lasting than emotions, several hours to days (e.g., gloomy).
Feeling	This term is used to refer to the subjective experience of emotions or moods. One component of an emotion that is typically measured via verbal self-report.
Arousal	This term is used to refer to physical activation of the autonomic nervous system. Physiological arousal is one of the components of an emotional response but could occur in the absence of emotion (e.g., due to exercise).
Preference	This term is used to refer to more long-term affective evaluations of objects or persons with a low intensity (e.g., liking of a particular piece or style of music).

1 INTRODUCTION

Music is global feature of humanity. It has always performed an important part in the lives of people all around the globe (Hodges 1996, 29). Physicist and a classically trained musician, Powell (2016, 36) contends that nowadays approximately one third of all things we are doing are somehow supported with music, and half of that time it has emotional influence on us.

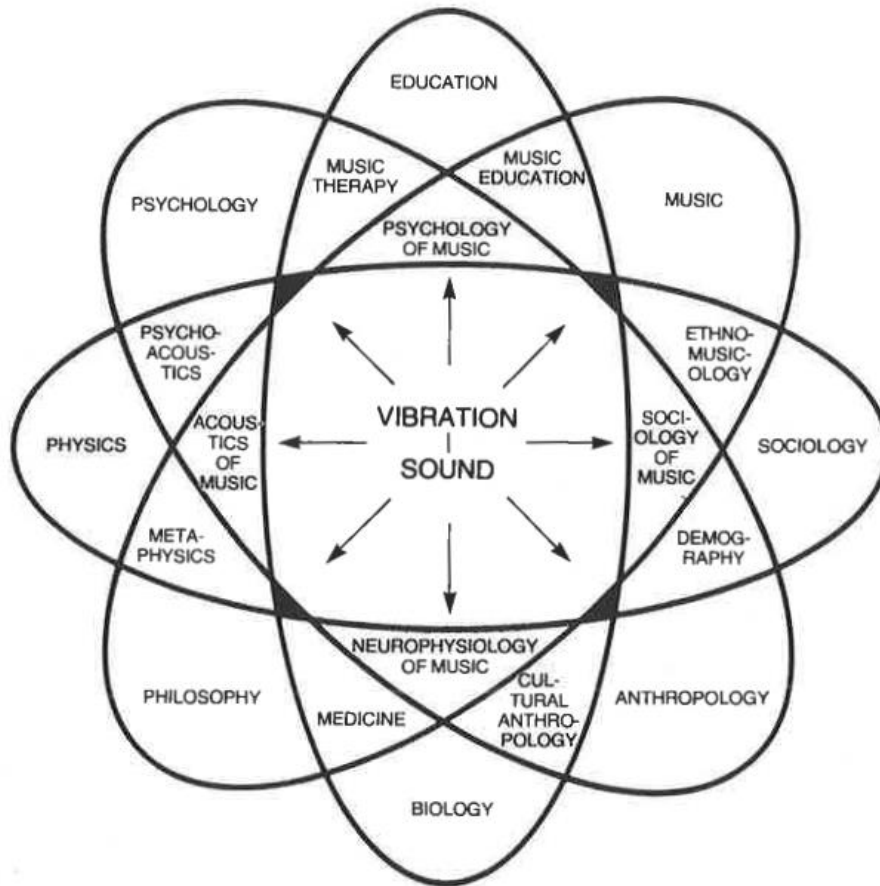
Although love for music has always existed as I remember myself, true interest for therapeutical side of music started back in 2015, when I experienced my first anxiety attack. Without getting into details, I can tell that music has saved my life. Since then, I always had that inner interest to explore why music has such a colossal influence on us human beings and how can it be used to improve physical and emotional states. Especially nowadays when stress can be witnessed in more younger individuals then before, it has become huge problem in modern society. As a result, new ways of fighting anxiety are required.

To create new ways progress is needed. Talking about the progress, Gaston (1968) reveals interesting thought on how to increase development in music therapy. He declares that we shall make significant progress toward completely realizing that music, as a form of human behavior, is distinctive and profound in its influence using findings and approaches from different sciences (Gaston 1968,7). Influenced by what Gaston has said, known as father of music therapy, this thesis will explain music and its aspects from different scientific directions; cultural, psychological and physical. It is all done to gain wider perspective on music and answer following questions:

- Is it vital tool for us to survive, exist and experience well-being?
- Why and how music has such an impact on human beings?
- How can it be used as substitute to traditional medicine in a form of music therapy?

The processes by which music influences in the therapeutic way still needs more investigation and research. An historical approach is recommended to understand innate humanity's ability to music, and the aspects in which this abil-

ity is influencing human life. As a result, therapeutic effects of music can be re-considered.



PICTURE 1. Descriptive molecule model of the interdisciplinary world of Music Psychology (Hodges 1996)

2 MUSIC AS A SOCIAL PHENOMENON

Singing, drumming, and the playing of any of musical instruments are all examples of music. Form of movement, such as dance, is unavoidable. Rather than being just a performance, music is a shared activity. It speeds up the pace of work, and no event or ceremony would be complete without dancing and music. (Klockars & Peltomaa 2007, 94.) Music is used to support public celebrations, military campaigns, and important family events like birthdays, initiation ceremonies, and rites of passage, as well as marriages and funerals (Hodges 1996, 491). Social phenomenon as music has great ability to blend people together through singing and dancing as can be seen in Picture 2. In any case, music allows us to become part of a community and so forget about our own existence. Just like listening to the music in waiting room or at the dentist's appointment allows patient to briefly surpass his or her body. (Klockars & Peltomaa 2007, 86.)



PICTURE 2. Weekend festival in Helsinki (Helsingin kaupunki, 2019)

Music not only reflects, but also influences, a society's way of life. Music, for example, plays an important role in the socializing process. We acquire certain amount of knowledge about what it is to be human and how to behave in various situations through the music we hear from womb to tomb. Music is one of many aspects that contributes to everyone's development into the particular

person that he or she is. Audiences display a variety of social behaviors, just as artists do in various performing circumstances. Compare the crowds at an opera, a Friday night barn dance, and a heavy metal band show. There are likely to be significant differences in socioeconomic position, age, clothing, speech patterns, and style of physical movement. Even if the same person attended all three sorts of performances on consecutive nights, their outfit, voice, and gestures would change to maintain social acceptability. Despite the music habits tells a lot about identity of the person and therefore can possibly divide people into groups, music has ability to bring people together. It has the power to bridge gaps of age, gender, economic status, ethnicity and nationality. (Hodges 1996, 505-523.) Humans are sociable creatures by nature. While we can thrive alone and have a need for privacy at times, we are compelled and motivated to engage with other people. Only few people who choose to function outside the society can be applicable as exception to the universal rule. Musical actions, on the other hand, are predominantly group behaviors. Even individual practice of musical skill nearly always has a goal to be to be shared with a community. (Hodges 1996, 496.)

2.1 Roots of the music

Since beginning of known human existence music has been important in movement and dance activities as part of religious, social, and political rituals, as well as to coordinate physical labour (Klockars & Peltomaa 2007, 30). As Hodges (1996) affirms that music has been essential for prehistoric civilizations in two ways. First of all communication to share knowledge and traditions for example about gathering resources, forming a family and another aspect is unifying factor to maintain solidarity spirit, keep protection from enemies and hunt effectively better. (Hodges 1996, 52.)

The anthropologists also discovered that, while the hunter-gatherer lifestyle can be challenging at times, the amount of free time is immense. According to studies of several of these communities, members often spend only twenty hours per week hunting and collecting, with another ten to twenty hours spent preparing food and performing other tasks. That means they had a lot of spare time. Marjorie Shostak, an anthropologist affirms the fact that the majority of the

hunter-gatherers she investigated spent their leisure time singing and creating songs, playing musical instruments, weaving detailed bead designs, telling stories, playing games, visiting, or simply resting. The fact that music is mentioned in the first three things on this list indicates its significance in this type of society. Given the hunter-gatherer lifestyle's consistency, we may reasonably conclude that music has always been an integral part of human life. (Powell 2016, 203.)

2.2 Cultural influence of the music

The evidence we have of humankind's first artistic actions must only account for a small portion of our forefathers' total creative output. But there is still enough proof to demonstrate that throughout whole existence of mankind all humans have been artistic beings. Music plays a symbiotic function in society, with cultural patterns shaping music and music influencing social behaviors. (Hodges 1996, 476-495.) "Humanly Organized Sound" and "Soundly Organized Humanity" are two episodes in which Blacking eloquently describes this symbiotic relationship of music and human societies (Blacking 1973). Music has been employed by all human communities. Scholars have searched for universals that appear over time and across cultures. Religious and shamanistic music, music for social ritual, music to influence and comprehend the natural world (by casting spells on animals during the hunt, for example), communication between mother and child (including the unborn), and others are examples of shared use categories like music to express important cultural information, music sexual selection and display, war music, dance music. (Gant 2017, 55.)

The ability to express emotions is one aspect of music that appears to be very common among various cultural groups. Wide range of emotions can be expressed with a help of music. This function can be experienced individually, such as when one person hums while working, in small groups, such as when young children chant and sing while playing, or in large groups, such as during collective celebrations. What distinguishes us from our foes on the opposite side of the river? Music is among the most efficient mnemonic mechanisms, allowing ancient societies to remember information, not only facts, but also the feelings associated with those facts. Poems, songs, and dances are the most common ways for a heritage to be passed along. Music is an important tool for

both teaching and the survival of social history. This is true in all communities, but particularly in those that depend on oral tradition. Learning the traditional songs and dances is an important way for children to understand about who they are and where they came from. Myths, legends, folktales, and records of significant battles and conquests are all passed down from generation to generation through song and dance. (Hodges 1996, 53-492.)

There is an initiation school (domba) among the Venda of South Africa that prepares young women for wedding, pregnancy, and motherhood (Blacking 1973). The girls learn a lot of everything they want to know about these adult roles via the domba's song and dance. They mimic various stages of the reproductive cycle through a sequence of songs and specialized dance movements, such as the khulo, in which girls react to pattern from mutavha, reed pipes played by the men. (Hodges 1996, 491.)



PICTURE 2. Domba dance performed by mothers with newborn babies (Centre for Social Anthropology and Computing n.d.)

Everything above approves fact that music is something more than just entertainment of a kind as it is usually used nowadays. It is like a language of emotions, traditions, storage of information to pass forward to the next generations.

I can tell my own observation in Latvia when I was participating in various cultural related arts as choir and traditional Latvian dances. In both we were performing songs and dances that were performed in beginning of the 20th century. Melody, story, movement and choreography, everything the same as over 100 years ago. Cultural aspects traveling from one generation to the next one, unchanged and pure, existing throughout the time and space. We are able to associate certain music with certain period of time and place. It is like time travel machine that can take us anywhere we want. For example, song of your first dance with a lovely one can take you back to your 5th grade party celebration and you are already on the dancefloor. Just close your eyes and let your imagination flow. Music helps to experience emotional travel into atmosphere of the song. Usually, people have certain picture, visuals, memories in their minds about the song.

Probably our ancestors knew about these abilities of the music and used it as a tool, mechanism to forward all possible information, cultural aspects to the next generation. As Hodges (1996, 494) affirms the necessity and existence of music as follows: "Above all, music exists because human beings have imposed a sonic order rather than passively accepting the sounds that nature provides."

As Sullivan (1997) notes about his observation where he emphasizes the importance of music in culture of African communities. And therefore, such an environment is created where musician is appreciated and required in different social activities. Music serves many purposes that other societies outsource to various types of institutions in many African communities. Music is a tool for the socialization of traditional values in Africa. Music plays an important unifying role in a variety of structured activities, and musicians play an important social role in community events. Major and minor-scale social events are occasionally arranged with music and dance. Musicians are respected authority on history and traditions in many African societies, and they frequently play key political roles, particularly in Western Sudan. (Sullivan 1997, 94.)

2.3 Religion and spirituality

According to Young (1978), a thorough examination of the brain's organization reveals that religion and creative art are necessary and creates universal as-

pects of all human life. They aren't just luxuries on the outside of life. They are the most crucial of all the functional aspects that keep humans in a state of homeostasis. (Young 1978, 231; Hodges 1996, 472.) As Ember and Ember (1973) confirms that religious worship is practiced by all human groups in one way or another (Ember and Ember 1973). Chanting, hymn singing, and meditation are spiritual exercises assisted by appropriate background music all over the world, alongside with other practices as prayer and preaching. Probably because both music and religion have something to do with unspeakable experience, they are so intimately linked. In a manner that words cannot, music allows us to experience and consider spiritual issues. (Ember et al. 1973; Hodges 1996, 481.) In many communities, music is used in courting and seasonal celebrations, rituals marking the transition between various phases of life, supernatural act with spirits to gain health or for oracular reasons and funeral ceremonies (Klockars & Peltomaa 2007, 11).

Music is abundant in early recorded writings; in the Old Testament, it is prominently used in the contexts of ritual, celebration, combat, seduction, and much more. After Roman empire and death of Christ history of music begins to shape into more familiar form as we know it today. As Gant (2017) specifies that music history is not just history about music styles. It is something more than just a history, it consists of external events such as war, ideas, reorganization of societies and improvement of technology. (Gant 2017, 25-27.)

Sufis have written extensively about the importance of music to the soul. One of the greatest Islamic thinkers of all time – and an expert on legal, juridical, and ethical issues – Abu Hamid al-Ghazzali. He writes:

Hearts and inmost thoughts, are treasuries of secrets and mines of jewels. Infolded in them are their jewels like as fire infolded in iron and stone, and concealed as water is concealed under dust and loam. There is no way to the extracting of their hidden things save by the flint and steel of listening to music and singing, and there is no entrance to the heart save by the ante-chamber of the ears. So musical tones, measure them pleasing, bring forth what is in it and make evident its beauties and defects. For when the heart is moved there is made evident that only which it contains like as a vessel drips only what is in it. And listening to music and singing is for the heart a true touchstone and a speaking standard; whenever the soul of the music and singing reaches the heart, then there stirs in the heart that which in it preponderates. (Sullivan 1997, 232.)

2.4 Music as “Universal language”

Probably music is the first language we all learn while we are still in mother's womb. Usually, mothers are singing to their babies even before they are born. Talking to them, to create first communication. That means we all were affected by vibrations of vocal cord, as well heartbeat and other sounds that are created from inside and outside of mother's body.

For thousands of years, all civilisations have sung to their offspring. Over two thousand years ago, Plato wrote about the positive effects of lullabies on children, and the fact that lullabies are alike across the world is strong evidence that singing and humming as a way of calming babies dates to the origins of human history. (Powell 2016, 206.) As Hodges (1996) explains the developmental importance of motherese on infants. He states that: the musical qualities of motherese are vital, not only as a tool for language development, but also for emotional communication. Because of the musical qualities of motherese, children are proficient at detecting the emotional meaning of speech long before they begin to speak. Music has the ability to communicate. What it communicates, how it communicates, and who it speaks are all culturally driven concerns. A multitude of communications are conceivable within each musical language. People who are fluent not only in the musical language but also in national language, are better able to participate in the culture's communication processes. (Hodges 1996, 470-488.) Zorn (2010) emphasizes that music works as medium of intervention itself, absence of language does not stop communication. He contrasts, that musicians are the harbingers of global community and planetary consciousness through their music. It is not necessary for musicians to communicate in the same language. They can improvise and play music together even if they do not speak. All they have to do, is listen to each other as they provide and receive sound. (Zorn 2010, 293.)

Blacking said: “There is so much music in the world that it is reasonable to suppose that music, like language and possibly religion, is a species-specific trait of man.” (Blacking 1973, 7; Hodges 1996, 259) From the more crystallized forms of anger, fear, or ecstasy to the more delicate and refined feelings of solitude,

satisfaction, or daydreaming, musically expressed feelings involve a wide range of emotions. The essential plotline is that music enables for the expression of feelings that cannot be expressed in any other way. Music is a time-based extension of the expression of emotion through sound. Traditionally, aestheticism or music criticism has been primarily concerned with how music communicates, how it alters our states and introduces us with insights. (Hodges 1996, 250-486.)

When emotions are expressed that are often much beyond the scope of spoken language, music or other nonverbal ways of expression are required. Music therapists readily agree with Goodman's assessment that nonverbal representations of the deepest, fiercest, and most complex emotions are likely closer to nonverbal representations than verbal representations. Music appears to create emotion-related concepts and thoughts, which appears to stimulate the symbolic process. A person might also analyze emotion driven topics from a symbolic distance when listening to music. This separation is sometimes important, for example, when dealing with anxiety and difficult psychological content. Music is not "a universal language," according to ethnomusicologists. They all agree that because we are only familiar with the music we grew up with, there are many sorts of music that we do not necessarily understand. However, we have now reached a paradoxical aspect of music: music is not something that we should be able to understand logically. (Klockars & Peltomaa 2007, 85-114.)

2.5 Rhythm of the life

Around the world there are as many rhythms as there are stars in the universe. There are dozens, if not thousands, different rhythms in every culture. Each person and artist add their unique sense of timing, breath, and imagination to these rhythm beats and patterns. Being human entails experiencing this rhythmic infinity. (Zorn 2010, 329.) Rhythm is the fundamental to both musical perception and physiological consistency of integrative process. When it comes to communication, rhythm is vital for coordination of internal and external functions. A viewpoint for perception is provided by rhythm. (Povel 1984; Aldridge 2000, 143.)

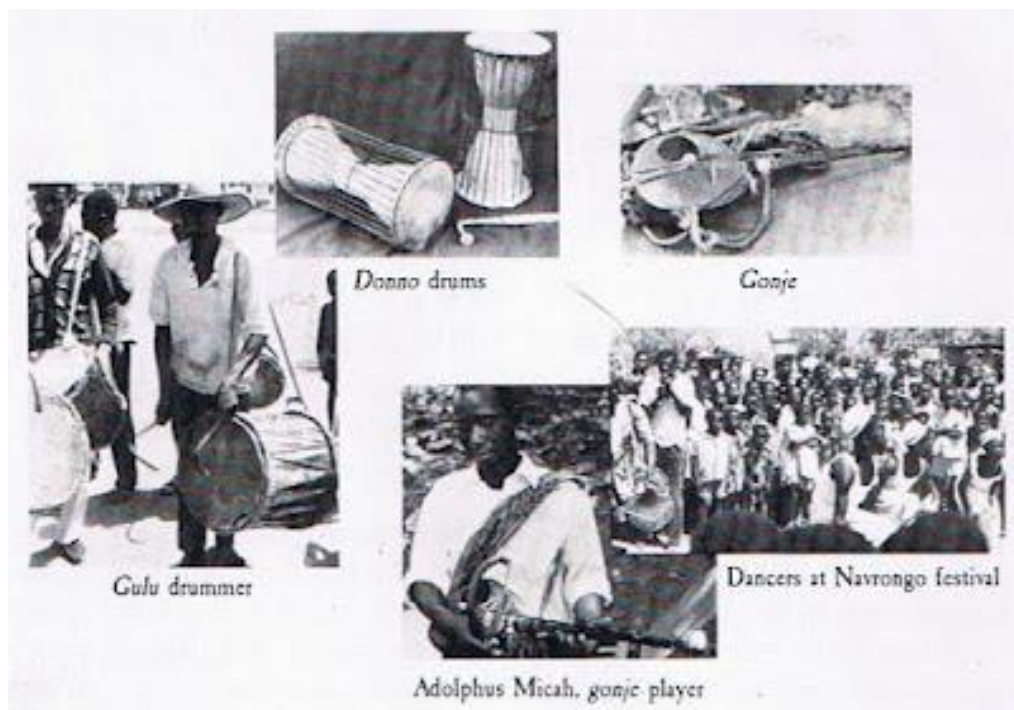
According to Farb (1978), humans live in what we consider to be a rhythmic existence based on periodicity measurements. Cycles of the year, moon phases, and times of day and darkness all follow to predictable patterns. Our bodies, too, follow a set of rhythms. Heartbeat and respiratory rate are two of the more visible periodic physiological functions. The brain monitors about 100 complex rhythms, including brain waves, hormone outputs, and sleeping patterns. (Farb 1978, 293; Hodges 1996. 43.)

As the world is developing so fast in each area, rhythm of our life grown exponentially as well. For example, nowadays average person can possibly receive as huge quantity of information in 1 day as average person 100 years ago only in 5 years. That's has created society with high stress level. Anxiety and other mental disorders are the result of constantly progressive reality we are living in. Wehr (1982) points out that rhythmic nature of our body has effects from music we are listening to. Our bodies work in a rhythmic manner, and we live in a rhythmic environment. Body rhythm disturbances are frequently signs of sickness, such as depression. (Wehr 1982.) Hodges (1996) as well asserts the significance of rhythm and our bodies and he states that because of various biotic and abiotic rhythms, our music has a significant rhythmic influence on our well-being. (Hodges 1996, 471)

According to Hodges (1996) movement and rhythmic activities such as dance are programmed into our bodies. It even seems that rhythm is vital for our existence and welfare. The influence of rhythmic involvement is far-reaching. The importance of rhythm in language development cannot be overstated. In addition, newborns that are rocked or have other body movements stimulated gain weight faster, establish eyesight and hearing clarity way quicker, and develop sleep cycles more regularly at a younger age. Perhaps more importantly to keep in mind that the cerebellum is closely connected to the limbic system, specifically the pleasure center region of the hypothalamus. As a result, physical movement is pleasurable to our body. As Hodges (1996) states about dancing that it appears to be a strong way of expressing joy, gratitude, and all the other emotions associated with the concept of celebration. Now it is clear that dance or any physical movement is core aspect for human being to be happy and en-

joy existence. It is embodied into our brains to provide us with pleasure whenever movement is created. (Hodges 1996, 44-481.)

People like creating music, listening to it, and doing activities to it, such as dancing to it. Entertainment is a purpose that frequently coexists with other functions, and it is one that underlies many musical activities. For example, among the Kassena-Nankani of northern Ghana, the jongo, a dance sequence that is also performed on numerous social occasions, is the most popular form of entertainment (Robertson 1985). Jongo, is typically performed with four cylinder drums called gulu, an hourglass drum named gunguna, and seven flutes known as wia. Only adults dance the jongo (PICTURE 3), although children love to imitate it. Before being given the chance to play instruments, the children must first practice replicating the sounds using various body parts. The drumming on somebody else's buttocks is a popular practice, and it often results in laughing. Adults usually end a dancing performance with competition, creating movements which others must replicate or even outmanoeuvre. (Hodges 1996, 488.)



PICTURE 3. Jongo music instruments and dance festival (Urso 1979)

Music and dance are maybe the first and most closely associated "related arts." Dance has a unique quality in that it appears to emerge from the joy of move-

ment, it is a dynamic, ecstatic celebration of human body flexibility through space and time, with music functioning as an auditory structure for reference. Dance is a way of bringing music to life on a physical level. Performing artists are acutely aware of the physical commitment required to create music. Dancers take those bodily motions beyond the limitations of the keyboard, bow, or baton, transforming them into unlimited, whole-body-oriented physical representation of the sound. Thousands of folk-dancing forms culturally express the invariant of dance. The polka, Scottish fling, square dance, and Amerindian rain dance are just a few of the many well-known examples; each is distinguished by its accompanying music as well as its dance moves. (Hodges 1996, 482.)

According to a Hooper (1981, 1982) survey of 4000 nations, more than 90% of them engaged in some form of institutionalized altered-state ritual (Hooper 1981 and 1982). Individual experiences taken through prayer, meditation, daydreaming, or substances must be added to this list. However, music has a significant influence in both group and individual activities aimed at generating altered states of consciousness (List 1984). Chanting a mantra or dancing to the wild beating of drums are two examples of how music can help individuals to experience altered states (Farb 1978). This serves a highly practical purpose for adolescent boys in central African tribal civilizations who follow their traditions with several days of continuous dancing to drum rhythms, resulting in an altered state of consciousness, allowing them to undergo circumcision without the need of anesthetic. Same phenomena can be observed everywhere around the globe, practically all the world's children would spin themselves to the extent of disorientation and collapse. (Hodges 1996, 482.)

According to Sullivan (1997) many genres of Muslim music uses quick, extremely repetitious rhythms that are played on frame drum called rebana and strongly expressed texts to drive believer to experience trance state and euphoria. Rhythm is an essential tool to acquire altered states of mind and body. The importance of it cannot be underestimated. It is something that co-exists inside and outside of us. Each creature and every manifestation of nature follows strict rhythms of existence that provides well-being and survival. (Sullivan 1997, 18.)

3 PSYCHOLOGICAL INFLUENCE OF THE MUSIC

Music has always been created and appreciated by men and women, as well as by their civilizations. Joy, happiness, love, melancholy, and despair have all been associated with music. It is emotional language. Morphological, physiological, and psychological aspects are in significant interest to understand how music transforms into intellectual information or deep emotions. (Klockars & Peltomaa 2007, 5.) The absolute universality of music involvement demonstrates its great value. Merriam (1964) an anthropologist has stated: "There is probably no other human cultural activity which is so all-pervasive, and which reaches into, shapes, and often controls so much of human behavior." (Merriam 1964, 218; Hodges 1996, 524), which leads to the conclusion that psychological influence of music is enormous, therefore controls, changes our behavior and affects us the way we are acting and existing in the society (Merriam 1964, 218).

According to the Powell (2016, 68) observation and various psychological studies, people that are listening to music and are open to new experiences as a result are often the ones who can experience much wider range of emotions. Hodges (1996) stresses out the necessity for further data gathering and development on use of music in every aspect of our life. He states that as more data is collected to support the value of music, music psychology will play an extremely essential role. The collection of scientific facts will document the relevance and meaning of music in such a way that society's perspectives will understand its importance and necessity more clearly. There is enormous opportunity for transformation in business, religion, education, therapy, and medical practice, as well as across society, and the role of music in these activities will become increasingly important in the future. (Hodges 1996, 59.)

3.1 Emotional responses

Music without lyrics cannot tell stories, but it has strong capability to influence us emotionally. Before continuing it is vital to understand difference between emotions and mood. Emotions are experienced just in certain moments, while moods are present in all times. As Powell (2016) points out about emotions that

they are short-term and powerful, and they're frequently tied to unconscious physiological responses like skin changes in temperature. If an emotion is linked with music, it will be synced with the music, which leads to conclusion that music has influence to trigger us emotionally. The most main thing to note regarding emotions is that they are naturally evolved physical and emotional responses that are necessary for human existence. (Powell 2016, 29.)

Anne Blood, a neuroscientist at McGill University, and her colleagues discovered that when sensory dissonance intensifies, so does activity in a brain area called Parahippocampal gyrus which responsible for unpleasant feelings. Essentially, sensory dissonance is a physiological mechanism that causes us to perceive particular note combinations as unpleasant. Powell (2016) affirms fact that the way the melody is harmonized with other pitches accounts for a large part of the emotional effect that music has on us. A change in harmony can dramatically transform a song's emotional impact on us. (Powell 2016, 149-175.) Eagle (1971) was the first to use a ten-statement Test for Existing Mood (TEM) to assess listeners mood. Twenty vocal and instrumental music fragments were played for 274 college music students. He reports that mood of the students before test had huge impact on the results received after the music listening. He also declared that there is certain range of difference on emotional level whether there was instrumental or music with vocal. (Hodges 1996, 304.)

3.2 Psychological mechanisms by which music produces emotions

“Patrik Juslin (2010), a music psychologist, and his fellow researchers have proposed seven main psychological mechanisms through which music generates emotions. They are:

- Brain Stem Reflexes – make you jump out of the way when you need to.
- Rhythmic Entrainment – Helps you to do repetitive physical tasks more efficiently.
- Evaluative conditioning – Helps you learn what's good for you.
- Emotional Contagion - can be thought of as a version of empathy: it helps you bond with people around you.

- Visual Imagery – Allows us to “dry run” things we are thinking of doing to imagine how safe or unsafe they are: “If I climb that tree to steal some bird’s eggs, will that branch hold my weight?”
- Episodic Memory – Helps you figure out what sort of situations you find rewarding, threatening, tiring.
- Musical Expectancy – Helps you to estimate what’s about to happen and prepare accordingly. This is a crucial skill. Even casual chitchat involves you getting your response ready while your co-chatterer is still finishing her sentence; if we couldn’t do this, every conversation would be full of those long, pregnant pauses you get in brainy French films. Those of us who don’t live in French films have to forecast how the other person will end each comment, so we can chip in immediately and demonstrate how attentive and clever we are.

(Powell 2016, 50)

All of these psychological systems assist you in maintaining your life. They take place whether you choose them to or not, and they can be activated by music or by sheer coincidence. Because the processes are autonomous of each other, a specific piece of music might activate one or more of them, and each lead to a different response, which reveals why different individuals have various emotional responses to the same composition. A dancing melody may inspire rhythmic amusement and emotionally excite one individual, but it may also recall for others an episodic memory and nostalgia for their early school days as a result of this. (Powell 2016, 54.)

4 PHYSICAL INFLUENCE OF THE MUSIC

We hear, compose music with our bodies, and we utilize our bodies as instruments to enhance the significance of what our bodies are capable of, as well to share similar patterns with others (Chapple 1982, 37-38; Hodges 1996, 513). According to Hodges (1996, 472), music influences several physiological processes, including heart rate, blood pressure, breathing rate, muscle tension, pupil dilation, digestion functionality, brain waves, and brain chemistry.

Hodges (1996) reports that 62 percent of the almost 190 significant hypotheses evaluated (including both endocrine and non-endocrine variables, achieved results that appeared to match with desired results: Increase in heart rate when music was stimulative, lowered heart rate when the stimulus was sedative, reduced muscle tension when the stimulus was calming music, decreased skin surface resistance when the stimulus was calming or relaxing, and lowered cortisol when the music was soothing. Physiological reaction is one of the most extensively researched topics related with the experimental research of musical responses. Study of psychological response includes neurology, physiology, anatomy and biochemistry and assessable physical functions that are motor, visceral, chemical, muscular or located in the centre of the brain. External cues as music are mostly responsible for such reactions. To establish observation of the physical and emotional states, all these reactions are then measured and documented. Hodges (1996) comments on everything said above, that musical experiences can trigger a broad range of physiological effects, including heart rate, blood pressure, brain waves, and muscle spasms (Hodges 1996, 247-375).

Interesting fact from Powell (2016), he reveals that music has been proven in several studies to enhance the amount of the antibody immunoglobulin A in saliva, which is a clear indicator of respiratory system's ability to fight infection. That leads to a conclusion that listening to music can guarantee happy, long and healthy life. (Powell 2016, 76.)

4.1 Perception of the sound

Distinguishing source and direction of the sound has been inevitable skill to survive from dangers that have surrounded humanity throughout the history of existence. Hodges (1996) contends that hearing is a fundamental ability that allows us to establish a steady inner world of time. When dinosaurs controlled the globe millions of years ago, mammals, which were then mainly little forest creatures, were required to hunt at night for their own safety. A high sense of hearing was required for night hunting. To be meaningful, sound events that occur over time must be arranged. For sound events to be meaningful they must be arranged over the time. A rustle of leaves could suggest an approach of predator or an escaping prey. As a result of evolution, we have a remarkable ability to perceive time-ordered sounds. (Hodges 1996, 45.)

Musical behavior from a biological perspective promotes a synergetic connection betwixt music and the body. To perceive time-ordered sound and experience it as music, various systems of physical body are used, for example visual motor, auditory and central nervous systems. That leads to conclusion that musical experiences have an impact on the body. This two-way interaction is not incidental one. Capacity to receive sound stimuli is more than just a passive physical perception. Although ear reacts to physiological change of vibrations and converts sound into neural signals, human brain is the last unit that is responsible of how we are going to perceive music. (Hodges 1996, 161-472.)

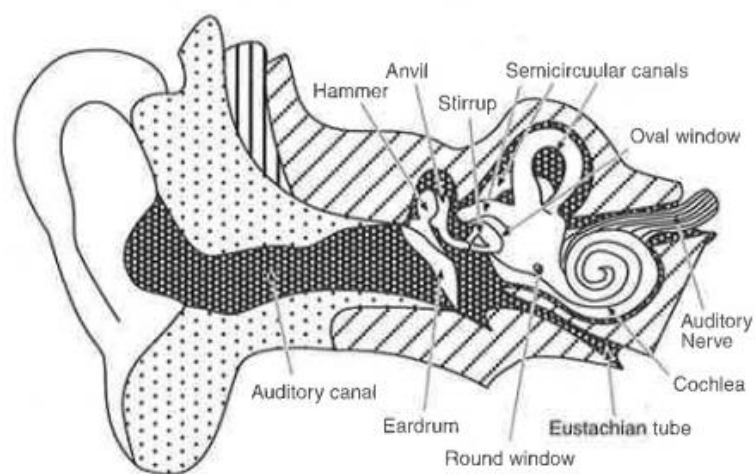


FIGURE 1. Ear, hearing mechanism. (Hodges 1996)

The ear, a biological organ converts the pressure caused by sounds that are travelling usually through the air, into neurological signals. Processing these signals engages various brain areas, including those associated with auditory and visual stimuli, emotion, and memory. Gant (2017) contends that music listening as activity utilizes more of the brain than any other activity, which leads to possible explanation why music has so enormous influence on our soul and psyche. (Gant 2017, 10.) Our emotional response to music can sometimes result in a significant somatic reaction. Professor John Sloboda has distinguished three physical responses to music that can be experienced independently or in conjunction. Professor John Sloboda has identified three main physical reactions to music – which can be experienced singly or in combination. They are:

- A “lump in the throat” feeling, sometimes accompanied by tears.
- A tingling skin sensation – goose bumps as the hair on your skin stands to end- sometimes accompanied by shivers down the spine.
- An increased heart rate, sometimes combined with a sinking feeling in your abdomen. (Powell 2016, 67)

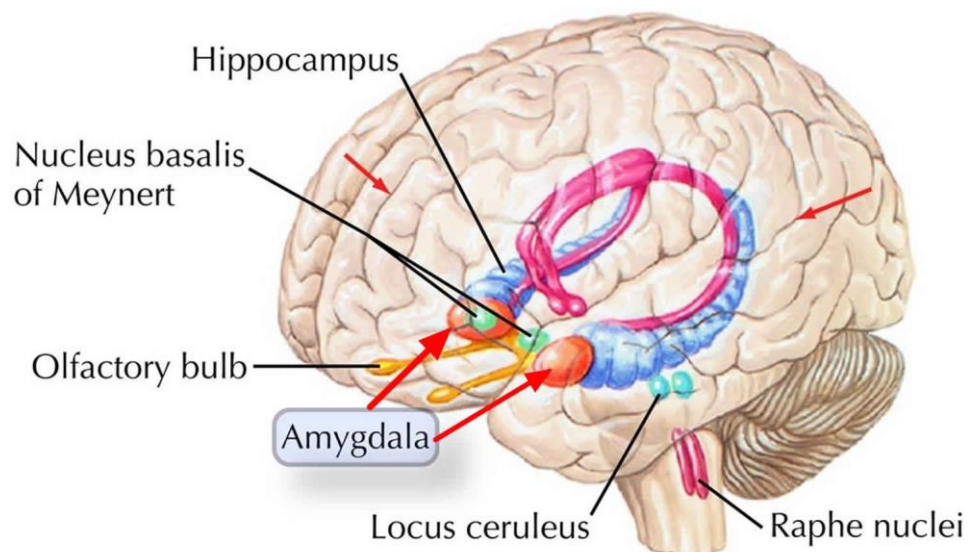
At the reticulospinal level, sound activates spinal motor neurons via auditory-motor circuitry. The reticulospinal tract is an important part of the central nervous system that allows the brain's higher centers to control the physical activities by sending signals from brainstem to our physical body. (Brain Made Simple 2020.) Based on results of electromyography test, basic music with dance and groove elements can trigger changes in muscle activity patterns that leads to jumping movement alleviation. Auditory stimuli lead to faster body reactions than visual or tactile cues. (Klockars & Peltomaa 2007, 30.) Talking about the body, radionics related research has revealed that humans are hypersensitive to sound stimuli in ways previously unknown. Our ears are not the only organ to receive sound, but our entire body is capable to receive frequencies. The radionics field are already using this phenomenon to gather data and perform diagnosis and treatment. (Hodges 1996, 15.)

4.2 Changes in nervous system

Facts first and first of all, based on research, Aldridge (2000) states that music helps people to calm down and decreases stress hormones like cortisol (Al-

dridge 2000, 117). Music is used not only to relax but also occasionally to emphasize the significance of certain events in our life. Evident examples of this phenomenon are weddings and funerals – however situations like selecting specific music for a drive in the province with a new partner can be counted in as well. And talking about romance, Powell (2016) contends that music stimulates the release of oxytocin hormone into our blood system. Oxytocin enhances social interaction, and it is generally released in case of breast-feeding and sex. Music, in fact, reinforces social connections when we dance or sing in public. Ask any soccer fan and you will receive confirmation and evidence of this fact. (Powell 2016, 41.)

Aside from being a high-scoring Scrabble word, the amygdala is one of the most important areas in the brain that is responsible for strong emotions (PICTURE 4). It is typically known as the "fear center" of the brain because of its importance in creating fear reactions, despite that it accomplishes other functions as well.



PICTURE 4. Amygdala (Health Jade n.d.)

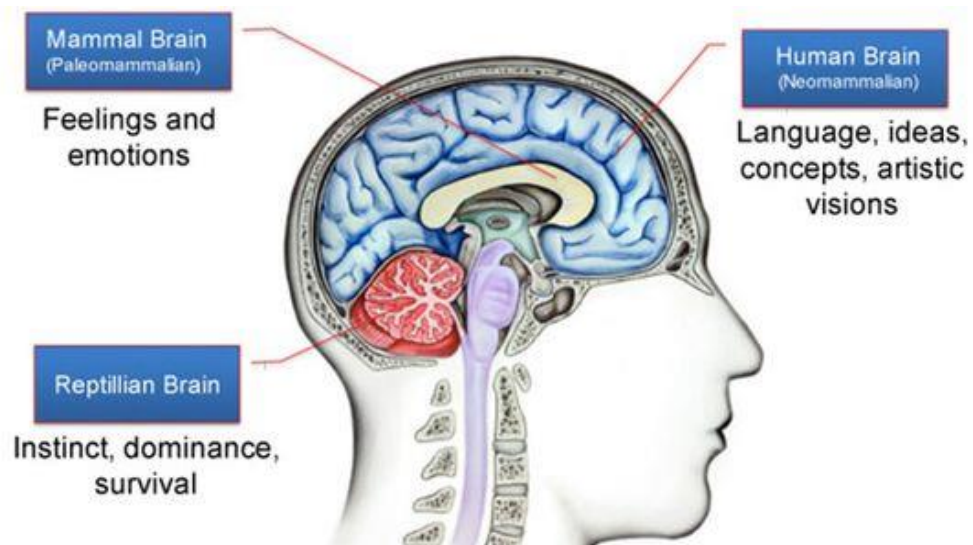
Inaccurate and flawed functional properties of amygdala can cause mental disorders ranging from depression to pathological anxiety. Neuroscientists Anne Blood and Robert Zatorre utilized brain scanning devices to analyze blood flow in different parts of the brain while research participants were listening to their music of preference. Results showed that brain areas associated with reward and positive emotions had increased blood flow, therefore decreased blood flow

to the amygdala. As a result, the pleasure centers worked intensively, and fear centers were on the vacation. (Powell 2016, 33.)

4.3 The effects of music on the brain functionality

First let's look on Maclean (1973) invented model named the triune brain (Picture 5). The human brain, according to his model, is composed of three parts – the reptilian brain, paleomammalian brain, and neomammalian brain (Hodges 1996, 201). Maclean (1973) points out that all three parts of the triune brain may potentially be affected by music. He defines as follows:

The reptilian brain contributes the ritual often associated with musical performances, the paleomammalian brain provides the emotional responses to music, and the neomammalian brain “master-minds” the whole affair, making possible all the unique understandings that come from music (Hodges 1996, 202).



Picture 5. Triune brain model (Pinterest n.d.)

Polk and Kerstes (1993) investigated two musicians with potential Alzheimer's disease and Related Dementias, and each of them had cortical atrophy. First participant who had left cortical atrophy and progressing aphasia including non-fluent and debilitated speech, rhythmically and melodically demonstrated fluent musical skills. Contrary situation regarding second participant, who had right cortical atrophy and spared language abilities. The results of the test are clear evidence that the right hemisphere of the brain is responsible for musical abili-

ties and accordingly left side of the brain supports language functions. (Aldridge 2000, 44.)

Various studies have demonstrated that music causes significant changes in the brain's neurological systems and influences beta, theta, alpha and delta brain waves (Musacchia & Khalil 2020). According to Radstaak, Geurts, Brosschot and Kompier (2014) our brain is wired to detect music and react to tones, rhythms, patterns and melodies. Electrical impulses from music are sent through auditory nerve to the auditory cortex of temporal lobe (FIGURE 2). (Radstaak et al. 2014, 529-537)

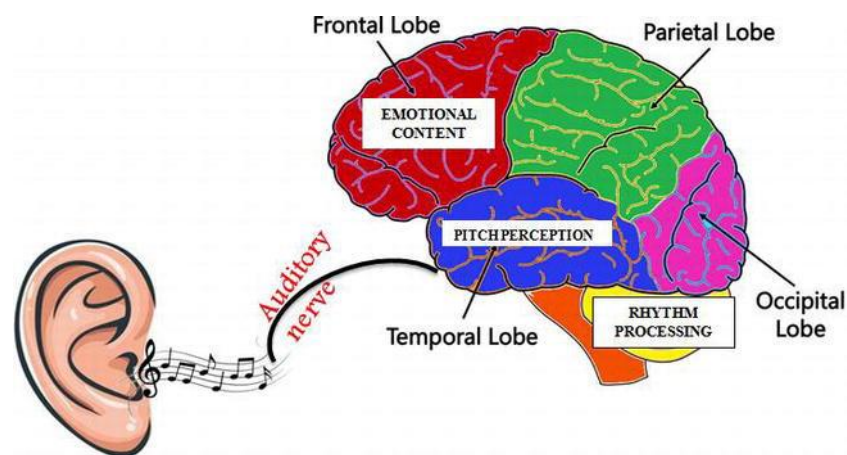


FIGURE 2. Sound processing in brain (Intechopen, 2022)

Another research made by neuroscientists Robert Zatorre and Valorie Salimpoor opens up a new perspective on our brain functionality. They employed high-tech brain scanning methods to investigate what happens inside our brains when we listen to music. They discovered that whenever we listen to a fresh piece of music, the nucleus accumbens is particularly active. This part of the brain is responsible for creating expectations, awareness and processing the success of the prediction. If prognosis is right, a reward is granted for successfully forecasting the future in a form of dopamine, therefore we experience enjoyment. Thanks to dopamine shot we are able to motivate ourselves to do certain actions that are beneficial for us as personalities and for humankind, for example eating and sex. Being skilled at predicting things in any situation is obviously beneficial from a survival point of view, so a reward is granted for every right prognosis in form of a dopamine dose. (Powell 2016, 215.) Neurological research has shown that music stimuli can increase the amount of acetylcho-

line, oxytocin and endorphins. Chemicals like endorphins are responsible for motivation, joy of life, pain reduction and overall happiness. (Agudelo 2002.)

5 MUSIC THERAPY AND ANXIETY

The physical and psychological influence of the music has been known for ages. Back in times of ancient Greece physicians were doctors and first semioticians. They analyzed signs of illness and utilized the therapeutic and curative properties of music, or what we nowadays define as music therapy. (Klockars & Peltomaa 2007, 83.) The songs and mantras of the healer or shaman played a significant role in the healing process in ancient times, and even now in modern days, this phenomenon can be seen in some nonindustrial communities. In modern age music therapy is based on scientific studies and clinical statistics. As Carter (1982) asserts that music therapy is scientific use of the music or musical activities that leads to therapeutic benefits. He adds that music therapy is a tool to manipulate manner of actions, as certain musical stimuli has a power to create certain behavioral change. (Carter 1982, 5; Hodges 1996, 542.)

People have learned how to handle their emotions thanks to the music, which is by far the most valuable skill. Despite that some emotional responses are hereditary and works as defensive mechanism, we must learn to understand and express our feelings. There is nothing like sensitivity to emotions that makes us who we are - human beings. To be a truly human being it is required to experience full range of emotions, countless shades of feelings. Most of our encounters with these beautifully feathered emotions are nonverbal. Take note of how restricted our language is in this area, and how often we have difficulties expressing our true feelings to others. As emotions are form of nonverbal communication, therefore music therapy is perfect for treatment as usually it does not require verbal interaction. As Aldridge (2000) implies that because creative arts therapies and especially music therapy depends less on use of language, they provide a unique access to retained memories and knowledge, which regulates our behavior (Aldridge 2000, 44). Music stands for most essential way to convey and signify emotional states. Musical experiences can help individuals to express and manage variety of emotions: despair, sadness and rage, as well as happiness joy and love. (Hodges 1996, 51-52.)

Ruud (1998), Adjunct professor in Music Therapy, for example, characterizes music therapy as follows:

Music therapy is the use of music and/or its musical elements (sound, rhythm, melody, and harmony) by a music therapist, and a client or group, in a process designed to facilitate and promote communication, relationship, learning, mobilization, expression, and organization (physical, emotional, mental, social, and cognitive) in order to develop potentials and develop or restore functions of the individual so that he or she can achieve better intra- and interpersonal integration and, consequently, a better quality of life. (Klockars & Peltomaa 2007, 115.)

5.1 Anxiety

Anxiety is becoming more common across all people worldwide, and therefore it has never been more widely recognized as right now. It is hard to discuss why anxiety is common, especially nowadays. Justification could be that many aspects are involved such as low self-esteem, loneliness, bad sleeping habits, past traumas, financial issues, conflicts, information overload, medications and social media. Despite social media has been created to bring people together, it can have contrary effect. According to study from Primack (2017) participants with high use of social media, were more likely to declare loneliness and social disengagement compared to participants with low social media use. In the last few decades, there has been a surge in interest in using music to relieve anxiety, and more study is needed to back up this practice.

Continuous anxiety can affect negatively on our relationships, work and home life. National Institute of Mental Health (NIMH) have described the symptoms of anxiety as follows:

- Feeling agitated or edgy
- Feeling exhausted
- Hard to concentrate
- Easy to annoy
- Different kind of pain such as headache, stomach-ache and muscle pain.
- Difficulty to control worry feelings
- Sleeping issues
- Loss of appetite
- Feeling of guilt
- Loss of self-confidence
- Easily getting scared (SingleCare 2022)

World Health Organisation (2017) revealed that in 2015, anxiety disorders were predicted to affect 3.6% worldwide. Despite small percentage, that means approximately 264 million people were living with anxiety. Research showed 14.9% anxiety increase in population, just in 10 years since 2005. (WHO 2017.) Closer look to anxiety statistics can be seen in Figure 3.

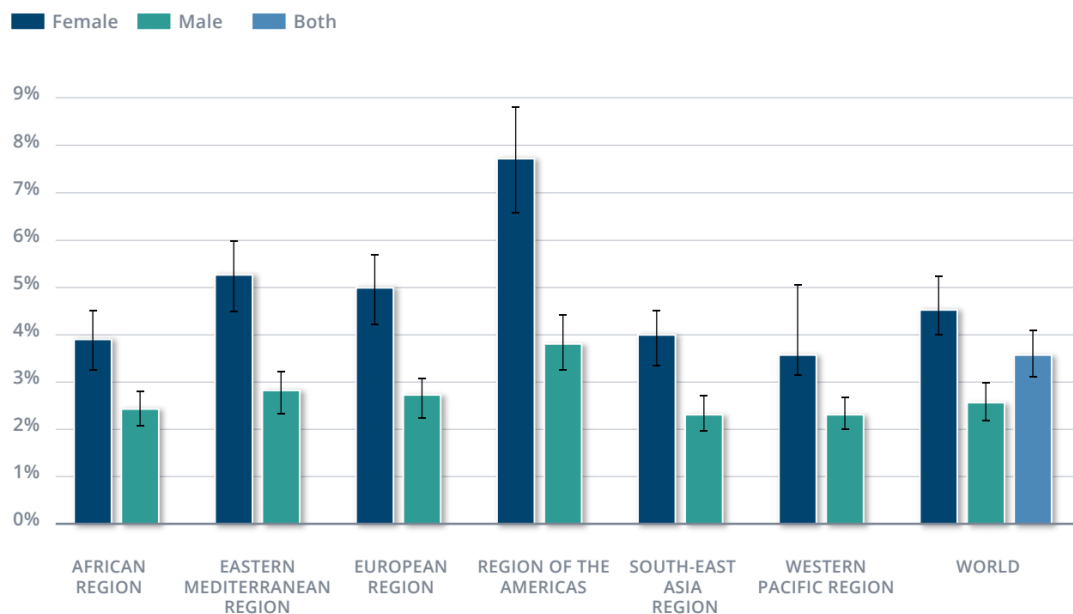


FIGURE 3. Prevalence of anxiety disorders (% of population). (WHO 2017)

Anxiety is well recognized as a potential cause in a variety of physical and psychological disorders, especially chronic stress can cause heart diseases, elevated blood pressure and even stroke. As a result, one of the primary purposes of music therapy is to reduce anxiety. (Elliot, Polmann & McGregor 2011.) Chafin, Roy, Gerin, Christenfeld (2004) and Yehuda (2011) emphasizes that there are various studies that proofs positive influence of music on body relaxation and stress relieve. However not every piece of music is suitable for anxiety relieve. (Chafin et al. 2004, 393-403; Yehuda 2011, 85-94.)

According to Davis and Thaut (1989) research participants who listened to their own selected music experienced relaxation and anxiety decrease, despite results physical arousal and excitement were present as well (Hodges 1996, 376 5.book). Jeong (2008) likewise discovered that respondents who listened to

preference music showed a greater reduction of anxiety compared to the group of people who listened to unfavourable music (Jeong 2008, 321-330).

Researchers have used a wide range of methods to evaluate anxiety in participants, while using different music genres. According to verbal reports and physiological evaluations, various studies have shown that music has influence on anxiety. Regarding the data, no information is given on what music genre will generate specific effect (Jellison 1975), however based on the research stimulative music makes people more anxious while sedative music relaxes and provides calming effect. (Hodges 1996, 306.) According to Bradt and Dileo (2013) music can be useful tool to alleviate anxiety for individuals with coronary heart disease, notably those with myocardial infraction (Bradt & Dileo 2013). Another study from Bradt and Dileo (2014) showed that music has favourable impact on anxiety for individuals who are placed in critical care. As Powell (2016) points out beneficial effect of music on stress by saying that music has the ability to decrease anxiety, lift up your mood and even boost concentration (Powell 2016, 73).

In conclusion, the benefits of adopting music therapy to manage anxiety includes the following:

- It is harmless and has no side effects.
- Effortless use in practice.
- It costs less to execute than other forms of traditional therapy.
- Its application needs minimum assistance from medical specialists.
- It is easily received by the listener without any exertion.
- It relaxes the mind, relieves anxiety, and creates calm and peaceful feelings in those who get it.

5.2 Practices of music therapy

Less or more, everyone is musical in some way since interaction with music is inevitable, it exists in every cultural environment. Even critically and completely ill-considered people react to music on the basic level. Hodges (1996) states that only extreme brain damage could be the reason to be amusical. According to what Hodges have mentioned above if you are reading this right now that

means your brain is working well and you are enough musically advanced and capable to interact with music and its elements. (Hodges 1996, 30.)

We are all musical Hodges (1996, 545) declares, just like our ability to be linguistic and mathematical. Music can be considered as a symbolic system as well. Music has the ability to represent and express a wide variety of emotions. Or, as Hodges (1996) writes:

Because this expression is nonverbal, it is difficult to describe or discuss, but this fact does not make it less real or less valuable. In fact, the very ambiguity of musical expression gives it much of its potency and permits it to operate in the wider realm beyond words, unlimited by the relative specificity and exclusivity of words. (Hodges 1996, 545.)

Each human being has extremities that means musical instrument can be played, if one is capable of talking therefore singing is possible. As Deliege and Sloboda (2003) emphasized human musicality by saying that capability to perform music does not require unique skill set, it is inside of us, legacy of humanity, ability that passes from generation to generation (Deliege & Sloboda 2003, 178 1.book).

Music is typically harmless and nonhazardous, and it is perfect tool to build safe and effective communication between therapist and patient. Music can boost self-esteem and enhance social interaction with others. It is useful tool for understanding and manipulating our physical and psychological states. One of the greatest aspects of music as healing method is that it does not require any verbal communication. For participants who feel uncomfortable or are unable to use vocal expression, music serves as a medium for communication. The non-verbal nature of music frequently gives an opportunity for music therapist to develop a good relationship with client who is vulnerable to use of language. In this approach, music therapy can be utilized to develop communication links, allowing other therapists to get engaged in the healing process. (Hodges 1996, 542-546.)

TABLE 1. Theoretical orientations in music therapy. Obtained from original Dutch version of N. van Nieuwenhuizen and M. Broersen (1998)

Theoretical orientations in music therapy
<p>Psychoanalytical music therapy</p> <p>Through the unconscious exploring of music, by listening to music or through improvisation, associations can be stimulated. The transference relationship, in which the client in a symbolic way experiences suppressed situations again, can help someone to release tensions and can provide new insights.</p>
<p>Behavioristic music therapy</p> <p>Using music as a stimulus, relaxation is induced in the listener, as a counterbalance for one's fears. Also, music can be used as a reinforcer for positive behaviors.</p>
<p>Humanistic music therapy</p> <p>Through unconditional acceptance of the client's musical expression and through a warm and honest approach, the client opens up in progressive steps. Clients discover their true personality and can make more realistic choices for a more desired future life.</p>
<p>Communicative music therapy</p> <p>During musical improvisation it is studied how the client interacts with others and how this is expressed in music. The analogy between the concrete musical, the desired social behavior and the client's experiences become apparent in a playful situation, and this gives clients the opportunity to experiment with themselves and in interaction with others.</p>
<p>Analogous process model</p> <p>In this model it is assumed that musical behaviors are in sense a reflection of client's daily lives, including their psychopathology. Through the use of musical methods, it is possible to positively influence the client's overall behavior and their experiences.</p>
<p>Creative process model</p> <p>A process in which clients can use creative processes, such as music, to release themselves from rigid patterns in relation to their environment by searching for their own personal composition, which is adjusted to their own desires.</p>

Despite there are many music therapy models (TABLE 1), Aldridge (2000) states that music therapy has two main types. Active music therapy, where individual or group of participants play music instruments together and passive music therapy where individual or group of patients are listening to the therapist playing instruments or pre-recorded songs. However, listening is an activity that is hardly passive. (Aldridge 2000, 139.)

5.2.1 Active music making

Music improvisation offers unique communication between musicians. It displays and reveals states of person or group in real time, bringing musicians together in very primitive and deep way. As Zorn writes:

“With the arrival of divine spark, improvisational music becomes a textless ecstatic dialogue vibrating open the door to the luminous moment.” (Zorn 2010, 328). Klockars and Peltomaa (2007) emphasizes that when we begin to play, perform, the musical activity overwhelms us totally, enslaving us to its will. Perhaps because experience is both physical and emotional, music has such a therapeutic effect on us. (Klockars and Peltomaa 2007, 86.)

Some study has indicated that combining music with other treatments can help people feel less depressed (Hanser 1990), according to a contemporary study, active music-making is linked to a lower risk of depression and anxiety (Tims 1999; Aldridge 2000, 85). According to other outcomes of the study from Tims (1999), music improvisation can reduce loneliness, despair, and anxiety in elderly people while also boosting their growth hormone levels (Tims 1999; Aldridge 2000, 87).

Singing is one of the types of active music therapy, and as Aldridge (2000) points out it is one of the most challenging one, as it brings issues for patients that are not confident in their vocal performance. Usually, this challenge appears because music therapist is musician himself or herself, and patients are afraid of criticism regarding quality of performance. As a result, music therapists must create safe environment that will inspire patient to sing and forget about possibly poor performance. All those concerns must be kept in mind if singing is used as therapeutic tool. The voice and vocal technique brings so much worries

as voice is such a personal music instrument. Singing shows person's nature and different aspects of personality. It works as most visible and clear indicator of physical and psychological well-being. Usually, talking about problems can be very challenging, and singing allows for desired emotional engagement and intimacy, which brings peace and helps easier to approach worries without having to speak about them. (Aldridge 2000, 80-90.)

Vocal anatomy and physiology are affected by psychological aspect and emotional well-being. Main role is played by larynx (FIGURE 3), or so called the voice box, mechanism that connects throat to the rest of respiratory system. The quality of vocal is affected by mental condition, posture of the neck and body, and air pressure in vocal cords. (Gauthier 1992; Aldridge 2000, 84.)

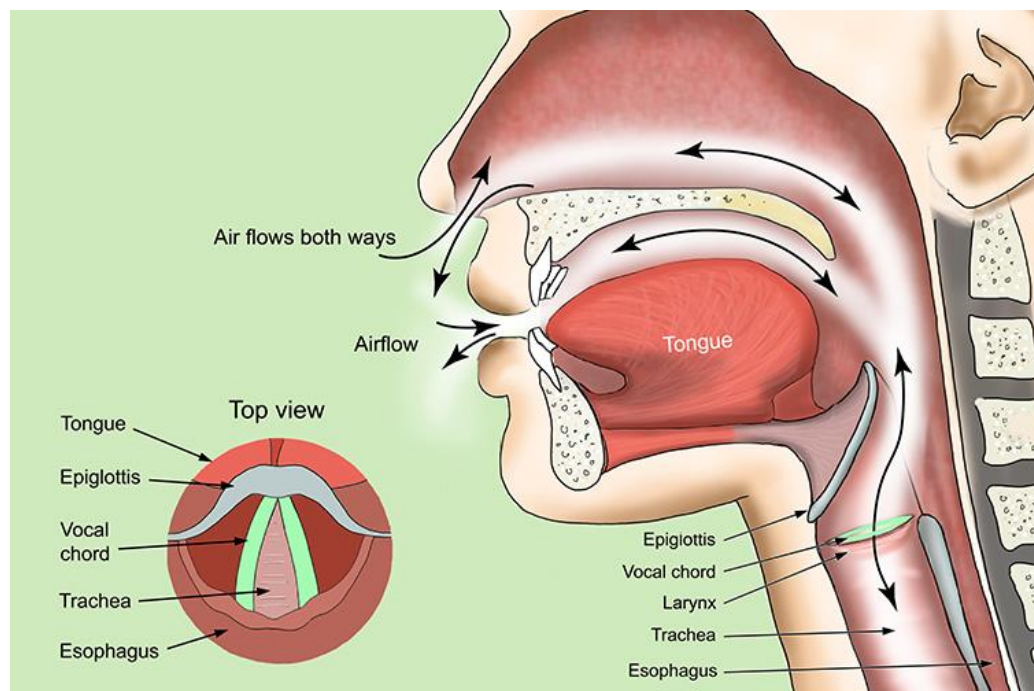


FIGURE 3. Larynx (Mammothmemory n.d.)

Aldridge (2000) affirms that muscular strain and posture, which affects the sound of the voice, has straight connection to emotional condition. If individual is depressed or have a bad mood, lowered head and crooked posture, short and weak breathing can be observed. That leads to the voice that is airy and lower in frequency range than individual usually has. If the same person is experiencing well-being, it is more obvious to see well-aligned posture and raised head. With appropriate diaphragmatic breathing and good posture vocal cham-

ber is located correctly and as a result voice frequency range is higher and it resonates more. (Aldridge 2000, 84.) Good posture, abdominal breathing and singing is beneficial against stress and its harmful effect on our body, as can be seen in FIGURE 4.

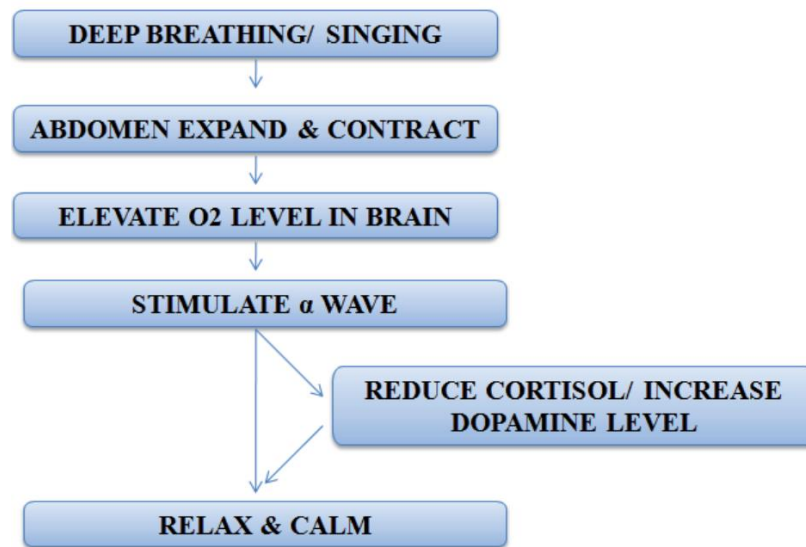


FIGURE 4. Mechanism of deep breathing (Intechopen, 2022)

According to Steffen (2011) singing exposes and establish opportunity to improve on various issues such as self-determination, safety, self-esteem, ability to make decisions, accountability, concentration. (Steffan 2011)

5.2.2 Passive music therapy

Usually music therapist provides soothing, calm music for relaxation. The main goal of passive music therapy is to promote calm and meditative atmosphere, where patient can relax and enjoy the music. Sedative music is used as well, if physical arousal or excitement of participant is needed. Despite it is called passive music therapy it is still activity and requires attention. Listening is action, consciously or unconsciously we are still affected by music. Just as we are born to be linguistic, with the specific language to be learned determined by the culture, so we are born with the means to be responsive to the music of our culture (Hodges 1996, 42).

5.3 Clinical benefits of music therapy

Powell (2016) states that according to many experiments, music therapy paired with standard health care, provides better well-being, lowers anxiety levels and stabilizes blood pressure in patients. President of the International Association for Music and Medicine, Suzanne Hanser tells observation that indicates benefits of music therapy. She contends that when patients with cardiovascular disease learned how music is changing their heart rate and blood pressure, they learned how to cope with anxiety and stress in their life. (Powell 2016, 75.)

TABLE 2. Clinical benefits of music therapy (Aldridge 2000)

Clinical benefits of music therapy	
Communication skills: personal	Maintenance and retirement of skills. Encourages learning new material. Improves memory skills for a short period of time.
Communication skills: social	Motivates and encourages purposeful interaction. Promotes interaction within sessions. Fosters spontaneous behaviour in social situations. Advances spousal caregivers' communication skills.
Behaviour management	Reduces agitation and disruptive behaviour. Reduces anxiety.

Prinsley (1986) suggests music therapy for elderly care since it minimizes the use of medicaments, hypnotics, generally helps in recovery. He suggests four treatment aspects in music therapy; social side, which includes interaction co-operation, psychological side, which includes mood improvement and self-expression, intellectual side, which includes speech stimulation and organization of mental processes, and physical side, which includes sensory stimulation and motor integration. (Aldridge 2000, 145.)

When there are difficulties in language abilities because of sickness, disorder, or disability, or when the individual is a small kid with limited verbal skills, music therapy, appears to be an effective approach. Any form of art therapy has certain beneficial aspects, such as creating natural connection to emotions or action, for example, playing instruments, drawing, dancing. Klockars and Peltonmaa (2007, 122) emphasizes that music therapy should be as substitute or addition to traditional psychotherapy as we know it today.

Usually, in the literature, music is characterized as stimulative, neutral or sedative. Stimulative, where music is percussive, fast, high rhythmic, high energy or loud and sedative, where music is slow, melodic, soothing, soft or relaxing. Hodges (1996) points out the importance of splitting music in these groups as each of them will have unique influence on listener's experience and talking about the influence he also notes that favorite music has greater influence on sensory arousal, be it stimulative or sedative music. (Hodges 1996, 348-375.)

5.3.1 Stimulative music

The main goal of music therapy is to lower stress levels. It would be logically to assume that stimulative music is not as effective as sedative music in case of anxiety. However, Dina Adam and her colleagues conducted the quasi-experimental study where older adults were practising dancing two times per week. After six weeks, results showed that dancing was beneficial in anxiety reduction. (Adam D., Ramli A., Shahar S. 2016.) Another study by Stefan Koelsch (2006) and his colleagues noticed blood oxygen raise in emotion related brain parts, and decrease of oxygen in amygdala, while participants of research were listening to upbeat, dance music. Oxygen levels indicates how effectively certain brain part is functioning, that leads to a conclusion that stimulative music has ability to lower activity of amygdala, so called the fear centre. (Powell 2016, 33.)

5.3.2 Sedative music

Powell (2016) declares that based on observations of many studies, sedative music before night-time helps people to sleep better, it is especially beneficial

for individuals who suffer from sleep disorders. Calming music decreases level of noradrenaline, stress hormone in our bodies, therefore lowers alertness and physical excitement, which results into good night sleep. To emphasize the influence of sedative music Powell (2016) mentions study created by Ronald Miliman, professor of marketing. The goal of study was to examine how people behaviour changes in case of sedative music in the background. While listening to sedative music people were spending by thirty percent more time in supermarkets compared to fast music. Individuals walked slower, therefore spending extra time to explore and purchase products. Ronald did the same experiment in restaurant environment and achieved the same results. With slow music people were spending an hour to finish their meal, on the other hand just forty-five minutes were required to finish the meal in case of fast music. Also, customers under the influence of sedative music spent one and half time more time on drinks. (Powell 2016, 12-77.)

6 DISCUSSION

According to biologists, all humans are musical by design, we were made to be musical beings. According to anthropologists, humans have been musical always and everywhere, music is an inherent element of our life. According to sociologists, music influences us just as we change our music, many social relationships are formed and affected by music. According to psychologists, any theory of the mind and how it functions can be explained as musical behaviour, as well as all other patterns of human acts. Music gives us a unique view into our emotional world. (Hodges 1996, 546.) Music has the ability to ease depression, reduce perceived pain, assist you in dealing with different disorders and diseases, reduce boredom, aid relaxation, assist you in focusing on a physical task, assist you in bonding with others, reduce stress, improve your mood, and saturate your life with range of emotions (Powell 2016, 217).

Given the numerous ways in which music is employed in today's environment, youngsters actually require certain knowledge about effects of music. They need to comprehend and be fully conscious about impact of music in their daily lives. They must be able to select and use music intelligently and effectively, to create their own sound environment to fulfill their own requirements rather than being victims of media. Absence of research-based theory makes it difficult for the practical fields of music education and music therapy to generate helpful materials and practices based on theoretical frameworks. For music psychology to create a more valuable difference to the practical fields of education and therapy, theories and models must be improved, research must be conducted based on these theories and models, and methods from these frameworks for use in practical situations must be developed. People have to be more aware about the importance of music and its enormous influence on our behavior and mood. (Hodges 1996, 397-547.) Hodges (1996) point out that in the future music will also become a more prominent mechanism of stress reduction, in both, educational and therapeutical way. Research results shows that in the future precise music will be produced for certain stress, psychological disorder. (Hodges 1996, 16.)

Anxiety in some way is like programmed inside of our body. It has saved humans from dangerous, even deadly circumstances. It is like a 6th sense of our body, that does not let us jump from top of the roof and signals about threatening environment and various alarming triggers. For thousands of the years, humanity had to survive under quite extreme conditions. Nowadays when people are spending that much time inside. Sitting, using various digital devices, not exercising enough, that all leads to anxiety. Let's be honest, our civilization, lifestyle has changed substantially only in last 100 years. Humanity used to survive, hunt and keep up active way of life, regularly exercising by doing work. On the other side nowadays, we are living comfortably and without death threatening triggers. However, from survival perspective we are not physically advanced to survive in extreme conditions, as our ancestors used to live. That leads to conclusion that despite our comfort zone, we still need to keep up a good physical shape, therefore experiencing well-being and avoiding anxiety disorders. What can be better than turning your favorite song on full blast and dancing like nobody is watching you? In my opinion in this combination music serves as a teammate, meditation that helps to keep up healthy body, peaceful mind and happy soul.

Music therapy can be very useful tool against anxiety. With further research, experiments, studies and technological progress, music therapy can have a very beneficial development in affecting our behavior. As we are made of around 70% of water, it is easy to come to conclusion that waves, frequencies and music has bigger influence on us than we can even possibly know right now. I believe that further investigation and research will open more positive effects of sound stimuli on our bodies, health, and overall well-being.

It is like a tool, ability, superpower that gives energy, power, motivation, physical and emotional arousal. I truly believe that music therapy can be very beneficial non-pharmacological intervention for us humanity to survive, live and function as a healthy, happy and dynamic human being in society, work and home. Listen to music, be healthy and live happily.

“If you want to find the secrets of the universe, think in terms of energy, frequency and vibration.” Nikolas Tesla (1856-1943)

REFERENCES

- Adam D., Ramli A., Shahar S. 2016. Effectiveness of a Combined Dance and Relaxation Intervention on Reducing Anxiety and Depression and Improving Quality of Life among the Cognitively Impaired Elderly. Published on 02.02.2016. Read on 03.04.2022 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4746043/>
- Agudelo, G. 2002. Music: A Factor of Social and Human Evolution (II). Red Cientifica.
- Aldridge, D. 2000. Music Therapy in Dementia Care. Jessica Kingsley Publishers, London and Philadelphia.
- Blacking, J. 1973. How musical is man? Seattle: University of Washington Press.
- Bradt J., et al. Music for stress and anxiety reduction in coronary heart disease patients. *Cochrane Database Syst Rev.* 2013 Dec 28;(12):CD006577.
- Bradt, J., et al. Music interventions for mechanically ventilated patients. *Cochrane Database Syst Rev.* 2014 Dec 8;(12):CD006902. doi: 10.1002/14651858.CD006902.
- Brain Made Simple 2020. Reticulospinal Tract. Published 14.02.2020. Read on 14.03.2022 <https://brainmadesimple.com/reticulospinal-tract/>
- Carter, S. 1982. Music therapy for handicapped children: Mentally retarded. Project Music Monograph Series, ed. W. Lathom and C. Eagle. Washington, DC: National Association for Music Therapy.
- Centre for Social Anthropology and Computing – University of Kent at Canterbury. N.d. read 04.05.2022 http://www.era.anthropology.ac.uk/Era_Resources/Era/VendaGirls/GrDombaSong/GDS_T2.html
- Eagle, C. T., Jr. 1971 Effects of existing mood and order of presentation of vocal and instrumental music on rated mood responses to that music. Ph.D.diss., University of Kansas.
- Chafin, S., Roy, M., Gerin, W. & Christenfeld, N. 2004. Music can facilitate blood pressure recovery from stress. *British Journal of Health Psychology*, 9(3), 393–403.
- Chapple, E. 1982. Movement and sound: The musical language of body rhythms in interaction. In *Interaction rhythms: Periodicity in communication behavior*, ed. M. Davis. New York: Human Science Press.
- Deliege, I., Sloboda, J. 2003. Musical beginnings: origins and development of musical competence. Oxford University Press.

- Elliot, D., Polman, R., & McGregor, R. 2011. Relaxing music for anxiety control. *Journal of Music Therapy*, 48(3), 264-288.
- Ember, C. and Ember, M. 1973. *Cultural anthropology*. Englewood Cliffs, NJ: Prentice-Hall.
- Farb, P. 1978. *Humankind*. New York: Bantam Books.
- Gant, A. 2017. *Music*. Profile books LTD.
- Gaston, E. T. 1968. Man and music. In E. Gaston, ed., *Music in Therapy*, 7-29. New York Macmillan.
- Gauthier, D. 1992. Vocal education: as short "chorus". *Music Therapy Perspectives* 10, 105-109.
- Hanser, S. 1990. A Music therapy strategy for depressed older adults in the community. *Journal of Applied Gerontology* 9, 283-298.
- Health Jade Team. N.d. Amygdala. Read on 04.04.2022 <https://healthjade.net/amygdala/>
- Helsinki Kaupunki (2019). Weekend festival. Published on 17.07.2019. Read on 04.05.2022 <https://www.hel.fi/helsinki/fi/tapahtumakalenteri/tapahtuma/?id=helsinki:aftznxyay>
- Hodges, D. A. 1996. 2nd edition. *Handbook of music psychology*. IMR press. The University of Texas at San Antonio.
- Hooper, J. 1981. Releasing the mystic in your brain. *Science Digest* 89 4:78-81, 120-22.
- Hooper, J. 1982. Mind tripping. *Omni*, October, 154-60.
- Intechopen 2022. *Music and Music Therapy Is a Medicine for Stress*. Published 11.01.2022. Read on 25.04.2022 <https://www.intechopen.com/online-first/79650>
- Jellison, J.A.1975. Analyzing the effect of music and white noise on physiographic measurements. In *Research in music behavior: Modifying music behavior in the classroom*, ed. C. K. Madsen, R. Greer, and C. H. Madsen, 206-19. New York: Teachers College Press.
- Jeong, H. C. 2008. The effect of music therapy on the physiological and psychological status of women college students based on their preference of music. *Journal of Korean Academy of Adult Nursing*, 20(2), 321–330.
- Juslin P. N., Liljestrom S., Vastfall D. And Lundqvist L. O. 2010. *How Does Music Evoke Emotions? Exploring the Underlying Mechanisms*. Oxford University Press.

- Klockars, M., Peltomaa, M. 2007. Music meets medicine. Helsinki: The Signe. Ane Gyllenberg Foundation.
- Koelsch S. 2006. Investigating Emotion with Music: An FMRI Study. Human brain mapping. 239-50.
- List, G. 1984. Concerning the concept of the universal and music. World Music 26, no. 2:40-47.
- MacLean, P. 1973. A triune concept of the brain and behavior. Toronto: University of Toronto Press.
- Mammothmemory n.d. Organs and systems. The pulmonary system. Larynx. <https://mammothmemory.net/biology/organs-and-systems/the-pulmonary-system/larynx.html>
- Merriam, A. 1964. The anthropology of music. Chicago: Northwestern University Press.
- Musacchia, G, Khalil, A. 2020. Music and Learning: Does Music Make You Smarter?. Frontiers for Young Minds 8:81.
- Nieuwenhuizen, N. van and Broersen, M. 1998. Muziektherapie: waar woorden tekortschieten. Leidraad Psychogeriatric B4:80-103.
- Pinterest. N.d. Triune brain model. Read on 29.03.2022 <https://fi.pinterest.com/pin/117375134018971051/>
- Polk, M. and Kerstes, A. 1993. Music and language in degenerative disease of the brain. Brain and Cognition 22, 1, 98-117.
- Povel, D. 1984. A theoretical framework for rhythm perception. Psychological Research 45.
- Powell, J. 2016. Why we love music. John Murray and Hachette UK Company.
- Prinsley, D. 1986. Music Therapy in geriatric care. Australian Nurses Journal 15, 9, 48-49.
- Primack, B. A. 2017. Social Media Use and Perceived Isolation Among Young Adults in the U.S. American Journal of Preventive Medicine. Published on 06.03.2017. Read on 14.05.2022 [https://www.ajpmonline.org/article/S0749-3797\(17\)30016-8/fulltext](https://www.ajpmonline.org/article/S0749-3797(17)30016-8/fulltext)
- Radstaak M, Geurts SA, Brosschot JF, Kompier MA. 2014. Music and psychophysiological recovery from stress. Psychosomatic Medicine 76(7):529-537
- Ruud, E. 1998. Music therapy: Improvisation, communication, and culture. Gilsum, NH, Barcelona Publishers.
- SingleCare 2022. Anxiety statistics 2022. Medically reviewed by Scott Dershowitz, LMSW, CMC, Lindsey Hudson, APRN, NP-C, CDCES. Published

15.02.2022. Read 15.04.2022 <https://www.singlecare.com/blog/news/anxiety-statistics/>

Steffen L. 2011. Singing: nonverbal elements and state of humor in the music therapy process. *Brazilian Journal of Music Therapy*.

Sullivan, L. E. 1997. *Enchanting powers. Music in the World's Religions*. Harvard University Press and Harvard University Center for the World Religions.

Tims, F. 1999. Active music making and wellness preliminary research results. Presentation at the Music and Medicine Conference, University of Miami Medical School, Miami.

Urso, J. G. 1979. *Ghana: Ancient Ceremonies, Songs & Dance Music*. Elektra Entertainment. Published on 16.02.2015. Read on 04.05.2022 <http://www.aeolus13umbra.com/2015/02/ghana-ancient-ceremonies-songs-dance.html>

Wehr, T. 1982. Behavioral aspects of circadian rhythmicity. In *Rhythmic aspects of behavior*, ed. F. Brown, and R. Graeber. Hillsdale, NJ: Lawrence Erlbaum Associates.

Wheeler, B. 1985. Relationship of personal characteristics to mood and enjoyment after hearing live and recorded music and to musical taste. *Psychology of Music* 13:81-92.

WHO 2017. World Health Organization. *Depression and Other Common Mental Disorders. Global Health Estimates*. Read on 01.05.2022 <https://apps.who.int/iris/bitstream/handle/10665/254610/WHO-MSD-MER-2017.2-eng.pdf>

Yehuda, N. 2011. Music and stress. *Journal of Adult Development*, 18(2), 85–94.

Young, J. 1978. *Programs of the brain*. New York: Oxford University Press.

Zorn, J. 2010. *Arcana V. Music, magic and mysticism*. Hips Road, New York