

WESTERN THEATRE'S USE OF MUSIC TO MANIPULATE
AUDIENCE'S EMOTIONAL RESPONSES

by

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ABSTRACT

Music and theatre have been utilized in conjunction with each other for thousands of years, dating as far back as 35,000 years ago. In the western hemisphere, the first implementation of music in theatre can be accredited to the ancient Greeks and their tragedies. The utilization of orchestras and instrumentalists enhanced the dramatic effectiveness of the tragedies being performed. The practice of using music to manipulate an audience's emotions in Greek society laid the groundwork for Western Europe, and North America's implementation of music in theatre. From musicals and straight plays to movies and TV shows, this unique and unlikely duo of music and theatre has been interwoven into our daily lives and become the cornerstone of American media. In this paper, the phenomenon of musical emotional manipulation will be analyzed through the lens of neuroscience, focusing specifically on how a western culture of music has impacted theatre and media's emotional manipulation of audiences via music.

The Use of Music in Western Theatre

Music can be traced throughout human history and has been known to stimulate the brain in many ways. Ancient civilizations dating back 35,000 years were using music as means to form tribal bonds and serve their religious and spiritual needs. These social and emotional behaviors of our ancient ancestors can be explained through western medicines and the analysis of the brain during music stimulation. But before diving into the neuroscience behind music stimulation, it's important to understand what style of music is being analyzed. Music is expressed across the world in many unique ways and comes in many forms. From Eastern Asian music and the pentatonic scale to middle eastern music with its microtonal scales. Music, like language, has its own set of social connotations attached to it. With these social connotations, come cultural implications, making it impossible to analyze on a global level. Music is a cultural construct that can only be analyzed in the context of the culture that which it was created. Instead of discussing music through a universal lens, this paper will focus on the discussion of a modern western style of music, and its effects on western culture, specifically in Western Europe and North America.

Much of North America's style of music can be accredited to the Greeks. The Greeks laid the groundwork for the Western world's music context by creating a functional system of modes. The Ionian mode, the base mode of all western music we consume today, was first created by the Greeks and continues to be used today. While the foundation of Greek music has shaped the cultural context of Western Europe and North America's music we know today, it has changed and shifted over the years. Western music we have known today has been delicately crafted over

the centuries, forming an ever-changing role in western society. Initially, the Greek's implemented music to heighten entertainment and enhance the audience's dramatic experience. This shifted in the Middle Ages when music became integrated with religious practice and the Western Catholic church. It was during this time that the first stages of music notation were established. A baseline system for reading and writing music emerged with catholic nuns in the medieval period, a close cousin to the notation system we use today. Towards the end of the medieval era, and the beginning of the renaissance, nonreligious secular music became popular and spread like wildfire with the emergence of the printing press. Music in the baroque period became focused on education and was a symbol of scholarly practice in western education. Music in pop western culture has since shifted back towards a more entertainment-focused style and will continue to change as time progresses. The history of western music is an important dynamic to explore, as it can explain the correlation between culture, audiences, and social context. As consumers change their preferences, music follows suit and creates a unique, ever-changing relationship.

Music has been used in many ways throughout western history, but the focus of this paper is to understand western music's role in evoking emotional responses in audiences. To do this, we must first understand how our brain interprets music. Music can be more simply categorized as a type of organized sound. These sounds are waves of pressure that travel through liquid, air, or solid mediums and make contact with the outer ear. The sounds then travel down the ear and into the eardrums where tiny hair cells are stimulated, sending electrical signals to the brain's auditory nerve. These electrical impulses travel through the auditory center of the brain into the temporal lobe, where they are translated into sounds and noises that we can comprehend. These translated

electrical pulses then travel across the brain, activating and engaging multiple different parts of the brain. While many different systems in the brain are affected by music, research over the past few years points to the limbic system being the most stimulated part of the brain during music consumption. The limbic system is a group of brain structures that are generally responsible for emotional responses, memory storage, memory recall, and the reward system of the brain. The Limbic system contains the amygdala, hippocampus, Para hippocampal gyrus, cingulate cortex, septal nuclei, mammillary body, fornix, and hypothalamus. The amygdala and cingulate cortex are responsible for emotional responses, while the hippocampus, Para hippocampal gyrus, cingulate cortex, and mammillary body are responsible for memory function within the brain. These systems are the direct reason why music is so effective in manipulating an audience's emotions: music stimulates the part of the brain that is in direct control of human emotion. Aspects of language have also been shown to stimulate near-identical brain areas that music does. Brown, Martinez and Parsons (2006) examined the neurological structural similarities between music and language. They stated that "utilizing positron emission tomography (PET), findings showed that both linguistic and melodic phrases produced activation in almost identical functional brain areas. These areas included the primary motor cortex, supplementary motor area, Broca's area, anterior insula, primary and secondary auditory cortices, temporal pole, basal ganglia, ventral thalamus and posterior cerebellum." Music and language in conjunction create a complex neuro network of stimulation across the brain, further engaging the processes of memory formation, retention, and recall. This is the main reason for the effectiveness of music in theatre. When both hemispheres of the brain are stimulated simultaneously, an even more intense emotional response is released creating a much more effective dramatic influence.

While music can affect the brain emotionally, it can also affect the body physically.

Physiologically, music can affect heart rate, respiration, blood pressure, skin reactions, and oxytocin in the blood. Each of these physical responses releases chemicals in our body that also play a role in the activation of the brain. In a Harvard health study, researchers concluded that a raised heartbeat sent an excess of blood and oxygen to the brain, increasing brain function.

Further research suggests that raised heart rates stimulate brain regions involved in memory function, releasing a chemical called brain-derived neurotrophic factor (BDNF). Oxytocin, a naturally occurring hormone within the body, is responsible for feelings of warmth, and fuzziness. The hormone has also been proven to reduce stress levels (Cortisol) and anxiety.

Oxytocin also has major impacts on the emotional response of the brain, evoking feelings of happiness and memory recall. Overall, the physical effects of music are important in the dramatic effectiveness and the emotional manipulation of audiences in the theatre.

Music's profound impact on our emotional responses can be accredited to the process of storing and recalling memories. In western culture, we associate tempos, timbres, melodies, and key signatures with specific emotions. Quicker tempos, major key signatures, and loud brassy instruments resonate with feelings of energy, happiness, and excitement. Slow tempos, minor key signatures, and instruments like chordophones, violin, and flutes generate feelings of sadness, grief, and longingness. These varying emotional responses to music are not due to different sound wavelengths or wave frequencies that our brain interprets. The electrical pulses translated from varying soundwaves have nothing to do with our emotional responses, but rather, our memory responses. With each sound that passes through our brain, a specific moment in time is then associated with that sound. These moments in time are classified as memories. These

moments in time, or memories, each have a specific emotional feeling attached to them. The emotion attached to the memory is determined by what emotional state the brain is in at the time of storing the memory, thus creating a link between a specific memory and its associated emotion. When the limbic system, or more specifically the hippocampus, is stimulated by a sound, memories are subconsciously recalled inside of the brain. These memories then evoke the associated emotion attached to them which is expressed through our moods.

Because our brains associate music with memories, and memories with emotions, the context of our cultural upbringing becomes extremely important to how we interpret music. The way our brain remembers and interprets the world around it is directly responsible for the emotional reactions that are felt by the brain. Cultural context shapes our experiences and the way we perceive reality. When the Greeks began the westernization of music 2,500 years ago, Aristotle and Plato introduced the concept of modes within music. These “modes” were differing scales that the Greeks developed. The seven modes developed included: Ionian, Dorian, Hypodorian, Phrygian, Hypophrygian, Lydian, Hypolydian, Mixolydian, and Hypomixolydian. Each of these seven modes was considered to have an effect/influence on the development of a human’s character. Dorian was considered to be happy and tamed their passions. Hypodorian was serious and tearful. Phrygian was considered to incite anger in one’s character. Hypophrygian incited delights and tempered fierceness. Lydian evoked characteristic qualities of happiness. Hypolydian incited tearful and pious character qualities. Mixolydian united pleasure and sadness. These ancient Greek modes all had associations with specific emotional qualities, which is seen in modern western cultures today. Modern western music has established its own set of rules similar to the Greeks. Our trained ears establish minor key signatures with “dark and

gloomy” emotions, while major key signatures are associated with feelings of happiness and relaxation. The association of memories and emotions is a key way theatre uses music to manipulate the emotional response of an audience.

Many western music composers became familiar with the emotional responses to melodies and scales and used them in their writing to change the perception of audience members. On Broadway in the 1920s, many famous composers such as Irving Berlin and Ira Gershwin composed songs that were extremely generic and easy to remember. The songs that they wrote for musicals could be taken out of context and they would still make sense. However, this style of composing changed in the 1940s with the hit musical Oklahoma. Rodgers and Hammerstein broke the generic song trend by composing music that was specific to the plot, and characters within the show. No longer were songs able to be taken out of their musical context and still make sense. This shift away from generic music in theatre enhanced the dramatic effectiveness of the shows, making the characters and plot much more complex. This complexity of plot and characters was warmly welcomed by audience members, and by the 1960s almost all generic musical theatre, songs had been phased out of Broadway. The shift from generic songs to plot-specific songs was also accompanied by a shift in acting style. Because the music was being used in the context of realism and was becoming more believable on stage, acting shifted from a presentation melodramatic style to a more psychological realism style. Since music and realism styles of acting were becoming popular at the same time, they became associated with each other. Films began to use music in their productions to enhance the viewer's experience by calling on emotions in the brain.

In the context of film, many directors have been using music as a way to evoke audience responses. The first movie to ever utilized a musical score was *L'assassinat du Duc de Guise*. Soon after this, “Talkies” emerged in the western film world, and music formed an integral part of the soundtracks. Movie scores shifted from music to sound effects to enhance the effectiveness of the performance. Science writer Philip Ball, the author of *The Music Instinct*, says soundtracks can evoke reactions of audience members by stimulating natural human responses. He says that we have “responses to certain kinds of noise that is so profound, we can’t switch it off,” he continues to describe how “Film composers know about instinctual reactions and use them to shortcut the logical part of our brain and get straight to the emotional centers.” A great example of this is filmmakers' use of infrasounds to induce fear in audiences. Infrasounds are extreme bass waves that have a frequency undetectable to the human ear. While infrasounds are not audible by human ears, it has been demonstrated to induce feelings of anxiety, extreme sorrow, heart palpitations, and shivering. These emotional responses can be accredited to naturally occurring infrasound that can be found in nature. Infrasound has been associated with areas of ‘supernatural activity’, as well as being produced before natural disasters such as storms and earthquakes. These events are processed by our brain as dangerous, triggering our flight or fight response, and in turn manipulating the audience’s emotions through sound.

In theatre and film, composers create melodies that are recognizable by audience members to guide their emotional journeys through theatre performances. A romantic scene can be completely transformed into a horror scene just by changing the music in the background to a loud drum that increases its tempo steadily. These emotional responses from music can outweigh the effect of dialogue, completely transforming the context of the words in theatre. The

composers are aware that the music within the show is capable of provoking much more intense emotional responses, therefore they specifically design and select instruments that will evoke the emotions they want audience members to feel. This example can be seen in movies. In many horror movies, the same types of instruments are used because they are known to elicit the same emotional response every time. Romantic scenes in movies compose music in a $\frac{3}{4}$ time signature to emphasize the feelings of a waltz or an intimate dance. It is through the music that the audience is most affected.

In conclusion, research shows that the use of music has been determined to be one of the most effective ways to evoke the emotion of audiences. Because of its direct impact on the Limbic system, music stimulates the brain in ways that enhance brain activity, memory retention, and emotional recall. Western theatre has used music and will continue to use music within its theatrical structures for many years to come because of its ability to change the perception of audience members. The relationship between music consumption and audience members is an everchanging complex that will continue to innovate and evolve as western cultures change.

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