Cilt: 7
Sayı: 4
Yıl: 2023

THE TRANSFORMATIVE POWER OF MUSIC: EXPLORING ITS INFLUENCE ON COGNITION, BEHAVIOR AND EMOTIONS

Nesrin DUMAN*

ABSTRACT

The aim of this general review is to delve into music's transforming potential and examine how it profoundly affects numerous facets of human experience, such as cognitive processes, behavioral patterns, and emotional responses. The model of this research is an interpretivist literature review. The existing literature consists of books and articles written by pioneering researchers examining the effect of music on cognition, behavior, and emotions. Four explanatory hypotheses —*arousal-based effects, priming effects, the influence of emotions on action, and dominance and control*—proposed for the effect of music on cognitive, behavioral, and emotional responses were reviewed. Arousal-based effects explained how music has the power to stimulate and calm people, profoundly affecting their mood and cognitive performance. According to the priming effects idea, music has the power to change a person's preparedness for particular tasks or activities by fostering the best possible mental and emotional state. The astonishing power of music to evoke and alter emotions has the potential to affect behavior and decision-making. The review's final section explored the ideas of dominance and control by looking at how music might affect people's experiences, perceptions, and overall attentiveness. Music may intensify sensory perceptions, heighten emotional involvement, and even influence how we interpret story contexts when it is combined with visual cues or immersive situations. As a whole, this review has demonstrated the transforming power of music by analyzing its impact on mental processes, behavioral routines, and emotional responses. The complex and profound connection between music and the human experience has been made clear through research into arousal-based effects, priming effects, the influence of emotions on action, and dominance and control. It is possible to unlock the power of music to enhance our lives and influence the course of society by comprehending these dynamic relationships.

Key Words: Arousal Based Effects, Priming Effects, Emotion, Music, Psychology

MÜZİĞIN DÖNÜŞTÜRÜCÜ GÜCÜ: BİLİŞ, DAVRANIŞ VE DUYGULAR ÜZERİNDEKİ ETKİSİNİ KEŞFETMEK

ÖZET

Bu genel gözden geçirmenin amacı müziğin dönüştürücü potansiyelini derinlemesine incelemek ve bilişsel süreçler, davranış kalıpları ve duygusal tepkiler gibi insan deneyiminin birçok yönünü nasıl derinden etkilediğini incelemektir. Bu araştırmanın modeli yorumlayıcı bir literatür taramasıdır. Mevcut literatür, müziğin biliş, davranış ve duygular üzerindeki etkisini inceleyen öncü araştırmacıların yazdığı kitap ve makalelerden oluşmaktadır. Müziğin bilişsel, davranışsal ve duygusal tepkiler üzerindeki etkisi için önerilen dört açıklayıcı hipotez -*uyarılma temelli etkiler, hazırlayıcı etkiler, duyguların davranış üzerindeki etkisi ve tahakküm ve kontrol*- gözden geçirilmiştir. Uyarılmaya dayalı etkiler, müziğin insanları nasıl uyarma ve sakinleştirme gücüne sahip olduğunu, ruh hallerini ve bilişsel performanslarını derinden etkilediğini açıklamıştır. Hazırlama etkisi yaklaşımına göre müzik, mümkün olan en iyi zihinsel ve duygusal durumu teşvik ederek kişinin belirli görev veya faaliyetlere hazırlık olma durumunu değiştirme gücüne sahiptir. Müziğin duyguları uyandırma ve değiştirme konusundaki şaşırtıcı gücü, davranışları ve karar almayı etkileme potansiyeline sahiptir. İncelemenin son bölümü, müziğin insanların deneyimlerini, algılarını ve genel dikkatlerini nasıl etkileyebileceğine bakarak tahakküm ve kontrol fikirlerini araştırmıştır. Müzik, görsel ipuçları veya sürükleyici durumlarla birleştirildiğinde duyusal algıları yoğunlaştırabilmekte, duygusal katılımı artırabilmekte ve hatta hikâye bağlamlarını nasıl yorumladığımızı bile etkileyebilmektedir. Bir bütün olarak bu inceleme, müziğin zihinsel süreçler, davranışsal rutinler ve duygusal tepkiler üzerindeki etkisini analiz ederek dönüştürücü gücünü ortaya koymaktadır. Müzik ile insan deneyimi arasındaki karmaşık ve derin bağlantı, uyarılma temelli etkiler, tetikleyici etkiler, duyguların eylem üzerindeki etkisi, tahakküm ve kontrol üzerine yapılan araştırmalarla açıklığa kavuşturulmuştur. Bu dinamik ilişkileri kavrayarak müziğin hayatımızı güzelleştirme ve toplumun gidişatını etkileme gücünü açığa çıkarmak mümkündür.

Anahtar Kelimeler: Uyarılma Temelli Etkiler, Ön-Hazırlama Etkileri, Duygu, Müzik, Psikoloji.

* Assoc.Prof.Dr., İstanbul 29 Mayıs University, Psychology Department, nesrinduman@windowslive.com

Araştırma Makalesi
Sayfa Sayısı: 1115-1127
Makale Geliş Tarihi: 29.10.2023
Makale Kabul Tarihi: 29.12.2023
Makale Yayın Tarihi: 31.12.2023

1. INTRODUCTION

People enjoy listening to music on a daily basis. While people do occasionally spend time listening to music, they also frequently listen to music in the background as they engage in other activities (Chamorro-Premuzic & Furnham:2007). Our daily activities, including work, reading, dining, shopping, and driving, are often accompanied by background music (North & Hargreaves:2008). People can be affected by background music in a variety of ways, including how it affects their mood, actions, and thought processes (Hallam:2018). It is well accepted that listening to music improves social interaction, intellect, and emotional health (Chanda & Levitin:2013). The potential negative or insignificant impacts of music have also been addressed in certain studies (Rentfrow & Gosling:2003; Schäfer et al.:2013).

In many areas of experimental psychology, some explanations are prominent in order to understand human cognition, behavior, and emotional responses. Over the course of its development, several areas of experimental psychology have focused on three explanations: *arousal-based effects (ABE), priming effects, and the influence of emotion on behavior* (North & Hargreaves:2008). All effects have been intensively researched in relation to music because they are fundamentally important to a variety of human actions and can all be brought on by listening to music (North & Hargreaves:2008; Hallam:2018).

In addition to these three explanations, there is another explanation that has been added to the literature as a result of the more recent research of Hallam (2009). The fourth explanatory mechanism "*dominance and control*" describes responses to environments in terms of approach and avoidance behaviors (Hallam:2009). This study will consider four proposed explanations for understanding the interaction of human cognition, behavior, and emotions and examine how music affects these systems.

1.1. The Aim of Study

The aim of this research is to construct a general analysis of literary texts on the transformative power of music. With this aim, we delve into music's transforming potential and examine how it profoundly affects numerous facets of human experience, such as cognitive processes, behavioral patterns, and emotional responses.

2. METHOD

2.1. Research Model

According to Noblit and Hare (1988:12), there are two major paradigms in the social sciences: interpretivism and positivism. Interpretivism is a philosophical perspective that emphasizes understanding and interpreting subjective meanings and social constructions of reality (Denzin & Lincoln:2018; Smith:2008). This study is in the context of the interpretivist paradigm. Interpretivist studies "interpret" reality through a "sense-making" process rather than a hypothesis-testing process. In the context of a literature review, an interpretivist approach involves examining and interpreting the subjective perspectives, interpretations, and experiences presented in the literature (Creswell:2013; Lincoln & Guba:1985). Accordingly, the model of this research is an *interpretivist literature review*, which is an approach to reviewing and analyzing existing literature that is guided by the principles of interpretivism (Denzin & Lincoln:2018). Interpretive reviews see the essential tasks of synthesis as involving both induction and interpretation. In this study, the existing literature and theoretical frameworks related to the research topic will be thoroughly examined and explained.

2.2. Materials

The materials used in an interpretivist literature review are primarily scholarly sources that provide qualitative data, subjective perspectives, and rich descriptions of experiences and interpretations (Creswell:2013; Denzin & Lincoln:2018; Lincoln & Guba:1985). The materials selected for this study are books and articles written by pioneering researchers examining the effect of music on cognition, behavior, and emotions. Books written by experts in the field often provide theoretical frameworks, conceptual discussions, and critical analyses that inform the interpretivist perspective. As for articles were accessed by scanning databases such as Scopus, *WoS*, ProQuest, and Google Scholar.

3. RESULTS

Four explanatory hypotheses are proposed for the effect of music on cognitive, behavioral, and emotional responses. Here, four explanations of arousal-based effects (ABE), priming effects, the influence of emotion on behavior, and dominance and control will be presented, respectively. Firstly, the explanations of Robert M. Yerkes & John Dillingham Dodson and Daniel Berlyne, important researchers in the field of arousal-based effects, will be examined. Secondly, explanations by various researchers (e.g. Hallam:2013; North, Hargreaves, MacKenzie, and Law:2004; Schellenberg, Nakata, Hunter, & Tamoto:2007; Rentfrow & Gosling:2003) in the context of priming effects are included. Thirdly, regarding the impact of emotions on our actions, Susan Hallam's answers to the question of why we react emotionally to music are discussed. Patrik N. Juslin's BRECVEMA Model will also be explained. And lastly, recent studies have investigated explanations suggesting that people's control over the music they listen to influences their reactions to music. Mehrabian and Russell (1974) and Krause (2014a, 2014b, 2015) are the important researchers mentioned in this title.

3.1. Arousal-Based Effects (ABE)

Arousal refers to the activation and physiological responsiveness of an individual's body and mind. Understanding ABE is crucial because arousal levels can influence an individual's cognitive functioning and subsequent behavior (Yerkes & Dodson:1908). Traditional studies on skilled performance concentrated on how arousal and cognitive load induced by a stimulus can mediate performance across a variety of domains. (Yerkes & Dodson:1908).

According to Gaston (1968), music can range from being extremely exciting and energizing to being tranquil or comforting (as cited in Hallam, Price, & Katsarou:2002). Strong data suggests that people react differentially to sedative and stimulative music (Radocy & Boyle, 1988; Hallam:2001) from a number of sources. According to studies conducted in the 1970s, quicker or louder music causes higher levels of physiological arousal, while slower or quieter music causes lower levels of arousal (Berlyne:1971).

Berlyne's (1974) psychobiological approach and Yerkes and Dodson's (1908) optimal level of physiological arousal are two significant fulcrum for arousal based effects.

3.1.1. Daniel Berlyne's psychobiological approach

The psychobiological approach to music developed by Daniel Berlyne in 1974 emphasizes how psychological and biological processes interact throughout the experience and perception of music. Focusing on the interplay between psychological and biological processes in the experience and perception of music, Berlyne (1974) took a psychobiological approach to music. A variety of emotional and cognitive reactions to music can be elicited, according to Berlyne (1974), and these reactions can be impacted by psychological and physiological factors. According to the psychobiological perspective of Berlyne (Berlyne, 1974), an individual's response to music may differ depending on their cognitive capabilities, personality qualities, and emotional states.

A variety of emotional and cognitive responses to music are impacted by psychological and physiological factors, according to Berlyne (1974). In this setting, music entails a complex interplay between sensory perception, emotional arousal, and cognitive processing and integrates both the cognitive and affective domains. This implies that music has the ability to evoke and precipitate emotional responses, and that these responses are mediated by physiological processes.

In order to better understand how music affects people and why certain musical elements evoke particular emotional responses, he stressed the significance of investigating the physiological and psychological processes that underlie musical experiences (Berlyne:1974). In general, Berlyne's psychobiological approach to music aims to investigate the interaction between psychological and biological aspects of the experience and perception of music, illuminating the neural pathways behind our emotional and cognitive reactions to music.

3.1.2. Yerkes and Dodson's optimal level of physiological arousal

The Yerkes-Dodson law was first proposed by Robert M. Yerkes and John Dillingham Dodson, two psychologists in 1908. This law contends that there is an ideal level of physiological arousal for carrying out

various tasks. According to this law, performance tends to rise with increasing arousal up to a point, at which point further arousal may lead to a decline in performance (Figure 1.). Yerkes and Dodson's framework can be used to comprehend the relationship between music and physiological arousal, as discovered by Hallam (2009).

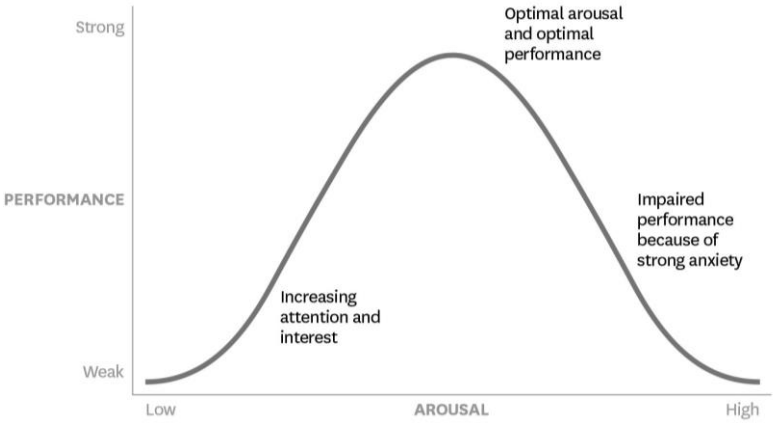

Figure 1. Yerkes and Dodson law

Individual diversity and taste preferences affect how music and physiological arousal interact. While some people might choose low-arousal music to help them rest and unwind, others might prefer high-arousal music to invigorate and motivate them. The context in which music is experienced can also affect how it affects physiological arousal. When it comes to music, various styles can arouse people to different degrees. To give an example, the effect of music on arousal during exercise may differ from the effect of music during a relaxing session. Or, music that is quick and energetic tends to raise arousal levels, whereas music that is quiet and soothing might have a calming impact and lower arousal levels. These reactions stem from pre-existing neural connections pertaining to the basic components of music, such as pitch, tempo, timbre, and loudness (Gabrielsson, 1993).

It is intricate and multidimensional to understand how music affects physiological arousal. Physiological reactions such as heart rate, blood pressure, and cortisol levels can be modulated by music. These physiological modifications may then affect cognitive and emotional functions. For instance, relaxing music can encourage relaxation and lower tension, but uplifting music that raises physiological arousal might result in an improved mood and better concentration. The subjective elements of music perception exist. The way that different people react to the same music varies greatly based on their personal preferences and traits (Hallam and Himonides:2022). The way people respond to music is influenced by a variety of factors, including the structural elements of the music (tempo, modality, instrumentation, genre), cultural factors (environmental elements like tonality and the way that musical associations are formed and learned), and associative factors (personal and subjective meanings attached to a specific piece of music based on musical experiences).

In conclusion, different forms of music can evoke varying amounts of arousal. This relationship between music and physiological arousal is a dynamic process. Individual characteristics, personal preferences, and environmental circumstances all have an impact on this connection. Understanding how music impacts physiological arousal might help explain the emotional and cognitive reactions it elicits and how it might affect people's behavior and well-being.

3.2. Priming Effects

Priming, the covert activation of different mental constructs by the perception of external stimuli (Bargh et al.:2010; Bargh & Chartrand:2000). Priming effects explore how prior exposure to certain stimuli can influence subsequent cognitive processes, perceptions, attitudes, and behavior. The process via which exposure to a certain stimulus modifies or alters a person's reaction to a subsequent stimulus is referred to as "priming." The "certain stimuli" that are being discussed here are the first stimuli that people are exposed to before their ensuing cognitive processes, perceptions, attitudes, or behaviors are assessed. Often referred to as "prime stimuli," these first inputs might take many different forms, including words, sounds, images, concepts, or

experiences. They are either purposefully or inadvertently introduced to people in an effort to elicit specific mental connections or representations. In the context of music, priming effects can occur when specific musical elements, themes, or genres such as melody, rhythm, harmony, lyrics, genre, instrumentation activate associated mental constructs or emotions.

The priming effect in music refers to the phenomenon where exposure to certain musical stimuli can influence subsequent thoughts, emotions, or behaviors. It is based on the concept of priming, which suggests that prior exposure to a stimulus can affect the processing and interpretation of subsequent stimuli. According to numerous specific forms of the idea (e.g., North, Hargreaves, MacKenzie, and Law:2004; Hansen and Hansen:1990; Martindale and Moore:1989; Hargreaves, Hargreaves, and North:2012), this process is concerned with the capacity of music to prime particular thoughts and connections. All of them address the issue of how certain musical compositions (e.g. classical pieces, popular songs, folk music, experimental or avant-garde compositions) can trigger various "networks of association" that unique listeners have accumulated during their listening lifetimes.

Music can prime various aspects, including emotional states, cognitive processes, and even social behaviors. Priming occurs when listening to a particular piece of music or a specific genre activates associated thoughts, memories, or emotions, which can then influence subsequent perceptions or actions. For instance, listening to sad music may prime individuals to experience a more introspective or melancholic mood, whereas listening to aggressive or fast-paced music may prime individuals to feel more energized and exhibit more vigorous movements or behaviors.

According to Hallam (2013), music has the potential to enhance cognitive functions like memory and concentration. Specific memories or associations can be primed by particular musical cues or melodies (such as signature melodies, recurring patterns, lyrics, instrumentation, or sound), enabling people to recall previous experiences or events connected to the music (Schellenberg, Nakata, Hunter, & Tamoto:2007). Furthermore, by affecting focus, attentiveness, or concentration levels, music can prime attentional processes (Husain, Thompson, & Schellenberg: 2002).

It's important to note that the priming effect in music is not universally consistent, as individual differences and personal experiences can modulate its impact (Peretz & Zatorre:2005). Moreover, the specific content, context, and meaning attributed to the music can influence the priming effects (Rentfrow & Gosling:2003). Cultural factors and individual musical preferences may also play a role in shaping how music primes certain thoughts, emotions, or behaviors (Hargreaves, North, & Tarrant:2005). Here is a nice place to provide some examples of cultural influences. Religious traditions, rituals, celebrations, and cultural ceremonies frequently depend heavily on music. A culture's political feelings, social movements, and historical occurrences can all be reflected in music. Some musical genres or songs may evoke strong emotional connections to conflicts or cultural identities by being linked to historical events, revolutions, or acts of resistance. Cultural values, ideas, narratives, and moral lessons are frequently passed down through music from one generation to the next, influencing people's perspectives and feelings about their cultural identity.

Overall, the priming effect in music highlights the powerful influence that music can have on our psychological and behavioral responses. By understanding how music primes certain mental and emotional states, researchers can explore its potential applications in various domains, including therapy, advertising, and enhancing cognitive performance (Salimpoor, Benovoy, Larcher, Dagher, & Zatorre:2011). Due to its potential applications in areas like improving cognitive performance, productivity and work environments, emotional regulation and stress management, rehabilitation, and physical therapy, understanding how music primes particular mental and emotional states is highly relevant across multiple domains. Understanding the mental, emotional, and cognitive states that music impacts allows for the efficient application of music in a variety of contexts, providing chances to enhance performance, well-being, and experiences in a range of human endeavors.

3.3. Impact of Emotion on Behavior

Emotions play a fundamental role in human behavior and decision-making. Emotions are important in the regulation of behavior; both negative and positive emotions are necessary for human beings (Duman:2019).

The impact of emotion on behavior examines how emotions, elicited by various stimuli such as music, shape cognitive processes, judgment, preferences, and actions. Emotions can influence attention, memory, evaluation, and the overall subjective experience.

Music is widely used to explore and regulate moods. In actuality, listening to music is the most frequent action we engage in to control our moods. It's a common perception that slow, quiet music reduces anxiety and helps us to relax, while stimulating music tends to increase our arousal levels (Hallam, 2018:20). The way that each person reacts to music varies greatly. It could be oversimplified to generalize about the effects of music based only on its tempo or volume, as there are many subtle ways that music influences people's emotions, arousal levels, and relaxation. Not all good effects of music. For instance, teenagers might utilize music as a diversion to keep from worrying about issues that would negatively affect their ability to adjust psychologically. It might worsen depressed symptoms and encourage suicidal thoughts to listen to music that addresses gloomy topics like suffering or death (Hallam, 2018:21).

According to Hallam (2018), Emerita Professor of Education and Music Psychology, there are three basic justifications for why we react emotionally to music. According to the first, there may be a *pre-existing link* between musical stimuli and emotional reactions. We react to the sound of music instantly and unconsciously, just like how we may react to a loud noise. Our autonomic nervous system reacts to variations in pace, dynamics, pitch, and timbre as the music changes. Research into the brain regions involved in strong positive emotional reactions to music has shown that these are the regions that light up in response to highly rewarding stimuli. It is known that dopamine and opioid systems, as well as other neurotransmitters, are active in connection with these reward mechanisms. As emotional responses intensify, the amygdala, which is linked to fear and other unfavorable emotions, also exhibits a decline in activity. It's possible that music's potent effects result from its ability to simultaneously elicit some emotions while suppressing incompatible ones. For example, a cheerful, catchy tune makes someone feel happy or joyful. Audiences can be excited and enthusiastic by listening to high-energy electronic dance music or intense rock. Listeners may experience feelings of strength and empowerment when they hear songs with inspirational lyrics or catchy melodies.

The second theory for why we react emotionally is that there *could be connections* to a particular emotional event in our lives, such music playing when we first met a lover. Music can have absolute meanings that are internal to the music itself or referential meanings that are about non-musical phenomena. Referential meanings concern actual events in life that are connected to specific musical compositions. For instance, hearing a piece of music from a loved one's funeral may bring back the tears.

Thirdly, when musical *expectations are disappointed* or delayed, emotions may be triggered. Expectations and tensions are raised by music. These can elicit various emotional reactions based on how they are realized or addressed. Expectations are created by music based on our understanding of the cultural tone and distinctive characteristics of different genres. Variations in how these expectations are fulfilled or broken influence how we feel when we hear music. We have developed a brain as a species that rewards accurate forecasting of the future. This appears to be how music elicits emotional responses. Brain systems store information about the recent past, forecast the future, and modify encoding when forecasts are incorrect (Hallam, 2018:23-24). Despite being primarily cortically based, mechanisms interact with the reward system to cause emotional reactions (Trainor, & Zatorre, 2016:285-306). Although primarily cortically based, these pathways interact with the reward system to cause emotional reactions. How we react emotionally to music that we are familiar with, or to which we know what to expect, is a problem for expectation theories. This is explained by the fact that our responses to unanticipated occurrences happen instantly and without thought, thus even though we are familiar with the song, we still feel something. In Western tonal music, frameworks involving rhythm, meter, tonality, harmony, and melody shape expectations. These give composers a variety of ways to defy expectations.

Additionally, studies have shown that musicians outperform non-musicians in a number of executive domains, such as task flexibility, information monitoring, working memory, and self-regulation (Moradzadeh et al., 2015; Zuk et al., 2014). Research has also demonstrated benefits for memory, particularly for verbal and auditory memory (Oechslin et al., 2013; Roden et al., 2014).

Several models have been developed to explain our overall emotional reactions to music. The most comprehensive is the BRECVEMA (the expression BRECVEMA consists of the initials of the 8 factors written in Figure 2.) framework described by Juslin (2013).

3.3.1. Patrik N. Juslin, BRECVEMA model

Patrik N. Juslin, head of the Music Psychology Group at Uppsala University, hypothesizes a variety of systems in charge of a person's emotional response to music. Juslin (2013) suggests an expanded and up-to-date version of the framework naming BRECVEMA that can explain both 'everyday emotions 'and 'aesthetic emotions '(Figure 2.). The initials of BRECVEMA can be seen in Figure 2. The BRECVEMA framework is the most thorough attempt to describe the mechanisms that might underlie music's emotional influence. These mechanisms elucidate the emotions evoked by music through connections to initial sensory responses and gradual cognitive operations. These mechanisms can operate either subconsciously or intentionally, encompassing shared or individual experiences. Moreover, music can either directly trigger emotions or serve as a surrogate for them (Völker:2019).

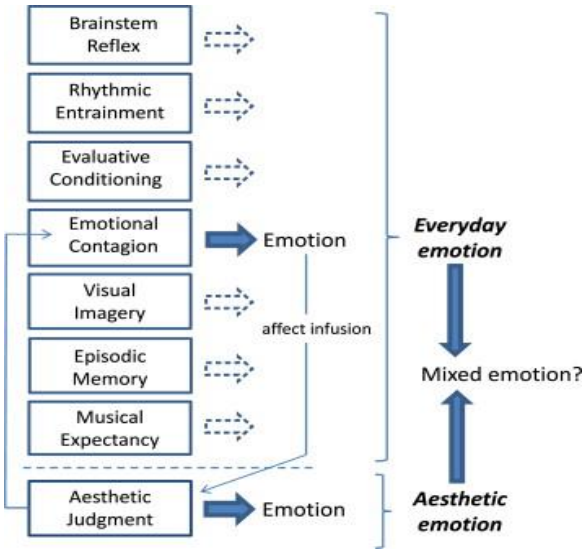

Figure 2. BRECVEMA model (Juslin, 2013)

BRECVEMA includes eight elements (Juslin: 2016):

***B**rain stem reflex*: A basic acoustic feature like excessive or growing loudness or speed triggers a hard-wired attention response in the brain stem known as reflex.

***R**hythmic entrainment*: The gradual synchronization of an internal bodily rhythm, such as the heart rate, with an external rhythm in the music is known as rhythmic entrainment.

***E**valuative conditioning:* A frequent link between a piece of music and additional favorable or unfavorable stimuli is called evaluative conditioning.

***C**ontagion*: Contagion is an internal mimicry of the music's allegedly emotive expression in the form of a voice.

***V**isual imagery*: Visual imagery is a metaphorical mapping of the musical structure that the listener uses to create interior images of an emotional character.

***E**pisodic memory*: The term "episodic memory" refers to a listener's conscious recall of a specific experience from their past that was sparked by music.

***M**usical expectancy*: The steady development of the musical structure and its expected or unexpected continuation causes musical expectation.

***A**esthetic judgement*: A subjective assessment of the aesthetic worth of the music is made by aesthetic judgment using a unique set of weighted criteria.

According to Juslin's theory, the mechanisms are connected to mental representations that are triggered when attention is focused on music. Simple representations are used by quick mechanisms, while more complex networks are used by sophisticated mechanisms (as cited in Völker:2021). Complex interplay between the individual, the situation, and the nature of the music determine the specific way in which emotions are evoked (Hallam, 2020:417).

These three explanations have garnered significant attention in experimental psychology because they shed light on the intricate relationships between cognitive processes, emotional experiences, and behavior. By studying arousal-based effects, priming effects, and the impact of emotion on behavior, researchers can gain insights into the underlying mechanisms that shape human responses to stimuli, including music. This knowledge has practical applications in fields such as advertising, consumer behavior, clinical psychology, and cognitive neuroscience, contributing to a deeper understanding of human psychology and behavior. A fourth explanatory mechanism, dominance and control has emerged from recent studies.

3.4. Dominance and Control

Susan Hallam's more recent studies and theories have shown a fourth explanatory mechanism "dominance and control" (Hallam, 2016:792). What is meant here is that the degree to which a listener dominates and controls the music they are listening to strongly influences how they react to it. To clarify a little further;

Dominance: The degree of power or influence that the environment has is referred to as dominance. When used in a musical composition, dominant elements or qualities can make listeners feel powerful, strong, or forceful. For instance, music that is loud, frantic, and has powerful beats and violent melodies may impart a sensation of domination.

Control: Contrarily, control refers to how much people believe they have control over their surroundings. This can apply to the capacity to select the music to listen to, change the volume, or skip tracks in the context of music. Controlling one's musical surroundings might help one feel independent and empowered.

According to the dominance and control mechanism, people are influenced by music through changes in how they perceive power relationships and their sense of agency in their surroundings. Researchers can learn more about the psychological and emotional effects that music can have on people by comprehending how it might elicit sentiments of control and domination. Examining the emotional and psychological effects of music, especially in connection to control and dominance, might help us better understand how thoughts, emotions, and behaviors are influenced by it. With the use of this understanding, specific experiences and therapies in a range of fields, including psychology, neurology, therapy, marketing, and entertainment, can be designed that capitalize on the ways in which music influences people's emotions and behaviors.

The dominance and control mechanism come from Mehrabian and Russell's (1974) environmental psychology model.

3.4.1. Mehriban and Russel's model

Albert Mehrabian, Emeritus Professor of Psychology and James A. Russell, an American psychologist proposes a model describing affective responses to stimuli. Mehrabian and Russell (M-R) model suggests that environmental stimuli are linked to behavioral responses by the primary emotional responses of arousal, pleasure, and dominance (Mehrabian & Russell:1974). The central idea in M-R is that environmental cues influence people's emotional states (e.g., degrees of pleasure or arousal) which then result in approach or avoidance behaviors.

This model provides an organized method for comprehending emotional reactions that go beyond binary valence—positive or negative. By taking pleasure, arousal, and domination into account, it captures subtleties and offers a more complete picture of emotional experiences. Furthermore, knowing the relationship between

dominance and emotional experiences is useful for creating events, products, or situations that are likely to elicit particular emotions.

The model describes environmental responses as *approach (AP)* and *avoidance (AV)* actions. The fundamental premise is that environmental signals affect people's emotional states (such as levels of pleasure or arousal), which then cause them to behave in either an approachable or avoidant manner. AP-AV responses thus creating a quadruple probability as follows:

- a want to physically remain in (AP) or leave (AV) the environment,
- a readiness or desire to look around and investigate the environment (AP) against a tendency to avoid moving through or interacting with it (AV),
- a want or readiness to connect with others in the environment and speak with them (AP), or a desire or willingness to avoid doing so and disregard their attempts to communicate with you (AV), and
- or the enhancement (AP) or hindrance (AV) of pleasure with tasks completed.

Individuals' emotional reactions to the environment determine whether they choose to approach or avoid certain components of it, and these reactions can be characterized in terms of these three distinct dimensions (Hallam, 2016:792).

Susan Hallam's recent studies use Mehrabian and Russell's model to explore the relationship between music and affective responses. She uses the model's dimensions of pleasure and arousal as a basis for understanding how music influences individuals' emotional experiences.

In the M-R model, “dominance”, last dimension, represents the degree to which the listener has control over the listening situation. For “dominance” dimension, Hallam (2016) also reviewed Amanda Krause’s studies. M-R model suggests that dominance, representing the degree of control over the listening situation, can influence individuals' emotional response and subsequent behaviors. Recent research by Amanda Krause emphasizes the importance of choice and control in listeners' experiences.

3.4.2. **Amanda Krause, importance of choice and control**

A music psychology scholar Amanda Krause has carried out a number of dominance studies that emphasize the importance of freedom and control. A listener's level of control over the listening environment is referred to as dominance. In the 1970s, 1980s, and to some extent in the 1990s, most listeners had little to no control over the music they listened to, therefore this was of little importance (Hallam, 2016:793). The prevalence of music has expanded along with our ability to manage our auditory settings, though, as a variety of contemporary digital listening tools that can be used independently have steadily emerged. According to Krause, listening should be more enjoyable when there is dominance (or control).

It is unclear whether this is because it promotes approach behaviors, which indicate a willingness to engage with the environment. On the other side, it has the potential to isolate people from it and lessen the need for interaction. Individuals' emotional reactions to the environment determine whether they choose to approach or avoid certain components of it, and these reactions can be characterized in terms of three distinct dimensions: pleasure, arousal, and dominance (Mehriban and Russel:1974).

It is essential to comprehend the theoretical justifications for these effects. According to recent studies, listeners' dominance and control over the music they listen to have a big impact on how they react. Choice and control are becoming increasingly important as digital music listening and greater personal control over aural settings grow. According to Krause's research (2014a, 2014b, 2015), people who feel they have greater influence over the music they listen to report feeling more satisfied and motivated. People's responses are also influenced by the setting and environment in which music is heard. For instance, music heard in private settings, where individuals feel dominant and in control, tends to be liked more and receive greater attention compared to public situations. Overall, these findings emphasize the active role of listeners as consumers and the influence of dominance and control in shaping their music-related experiences.

4. CONCLUSION

This publication discusses four explanatory ideas that explain how music affects cognitive, behavioral, and emotional responses. There were four hypotheses offered for priming effects, dominance and control, emotion's impact on behavior, and arousal-based effects (ABE).

Firstly, arousal-based effects in music are reviewed. The explanations of Robert M. Yerkes & John Dillingham Dodson and Daniel Berlyne, important researchers in the field of arousal-based effects, were examined. Arousal refers to the activation and physiological responsiveness of an individual's body and mind. Arousal levels can influence an individual's cognitive functioning and subsequent behavior. People can react differently to music that can be extremely exciting and energizing or calm and relaxing. Various music styles can arouse people to different degrees. On the other hand, regarding the psychobiological perspective of Berlyne, an individual's response to music may differ depending on their cognitive capabilities, personality qualities, and emotional states.

Secondly, priming effects in music are handled. Explanations by various researchers (e.g. Hallam:2013; North, Hargreaves, MacKenzie, and Law:2004; Schellenberg, Nakata, Hunter, & Tamoto:2007; Rentfrow & Gosling:2003) in the context of priming effects are included.

The priming effect in music refers to the phenomenon where exposure to certain musical stimuli can influence subsequent thoughts, emotions, or behaviors. It is based on the concept of priming, which suggests that prior exposure to a stimulus can affect the processing and interpretation of subsequent stimuli. Certain musical cues or melodies (e.g., signature melodies, repetitive patterns, lyrics, instrumentation, or sound) can prime specific memories or associations, allowing individuals to recall past events or experiences linked to the music.

Thirdly, indirect effect of music via emotions are examined. Regarding the impact of emotions on our actions, Susan Hallam's answers to the question of why we react emotionally to music are discussed. According to Hallam, there could be connections to a particular emotional event in our lives. Or, there may be a pre-existing link between musical stimuli and emotional reactions. Or maybe, when musical expectations are disappointed or delayed, emotions may be triggered. Patrik N. Juslin's BRECVEMA Model was also explained here. The BRECVEMA framework is the most thorough attempt to describe the mechanisms that might underlie music's emotional influence. These mechanisms elucidate the emotions evoked by music through connections to initial sensory responses and gradual cognitive operations. According to Juslin's theory, the mechanisms are connected to mental representations that are triggered when attention is focused on music.

Lastly, recent studies have investigated explanations suggesting that people's control over the music they listen to influences their reactions to music. Mehrabian and Russell (M-R) model suggests that environmental stimuli are linked to behavioral responses by the primary emotional responses of arousal, pleasure, and dominance. M-R model suggests that dominance, representing the degree of control over the listening situation, can influence individuals' emotional response and subsequent behaviors. Krause's recent research emphasizes the importance of choice and control in listeners' experiences. According to Krause, listening should be more enjoyable when there is dominance (or control).

In conclusion, music holds significant potential to shape and influence various aspects of human experience. The four explanatory propositions presented in this article shed light on the intricate relationship between music and cognitive processes, behavior, and emotional responses. By understanding how music can stimulate or calm individuals, create suitable mental states, evoke and modulate emotions, and exert control over attention and perception, we gain valuable insights into its diverse effects on human behavior. These findings have practical implications across different domains, including therapy, education, and marketing. Further research in this field can deepen our understanding of music's impact and enable us to harness its power more effectively for the benefit of individuals and society as a whole.

4.1. Recommendations for Further Research

- More experimental studies are needed for environmental responses as approach (AP) and avoidance (AV) actions

- Music and emotion impact research needs to go deeper.
- The applications of all theoretical explanations should be carefully examined in terms of consumer behavior.
- The applications of all theoretical explanations should be carefully examined in terms of the manipulation of individuals and society.

REFERENCES

Bargh, J. A., & Chartrand, T. L. (2000). *Studying the mind in the middle: A Practical guide to priming and automaticity research*. In: Reis H, Judd C, editors. Handbook of research methods in social psychology. New York: Cambridge University Press.

Bargh, J. A., Gollwitzer, P. M., & Oettingen, G. (2010). *Motivation*. In: Fiske S, Gilbert DT, Lindzay G, editors. Handbook of social psychology. New York: Wiley; pp. 268–316.

Berlyne, D. E. (1971). Aesthetics and psychobiology. *Cognitive Psychology*, 2(3), 331-50.

Berlyne, D. E. (1974). *Studies in the new experimental aesthetics: Steps toward an objective psychology of aesthetic appreciation*. Hemisphere Publishing Corporation.

Chamorro -Premuzic, T., & Furnham, A. (2007). Personality and music: Can traits explain how people use music in everyday life? *British Journal of Psychology*, 98(2), 175-85.

Chanda, M. L., & Levitin, D. J. (2013). The neurochemistry of music. *Trends in Cognitive Sciences*, 17(4), 179-93.

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches*. Sage Publications.

Denzin, N. K., & Lincoln, Y. S. (2018). *The SAGE handbook of qualitative research.* Sage Publications.

Duman, N. (2019). Mentalizasyon ve mentalizasyonun psikopatoloji, duygudurum düzenleme, saldırganlık ve şiddet ilişkisi üzerine bir derleme. *Pesa International Journal of Social Studies*, 5(2):200-8.

Gabrielsson A. (1993). Emotion and music. *Newsletter of the European Society for the Cognitive Sciences of Music*, 4, 4–9.

Gaston, E. T. (1968). *Music can range from being extremely exciting and energizing to being tranquil or comfortin*g. In E. T. Gaston (Ed.), The Power of Music (pp. 45-62). New York, NY: Music Publishers.

Hallam, S. (2001). The development of expertise in musicians: Implications for teaching. *Psychology of Music*, 29(3), 275-89.

Hallam, S. (2009). *Music psychology: An overview*. In S. Hallam, I. Cross, & M. Thaut (Eds.), The Oxford handbook of music psychology (pp. 3-18). Oxford University Press.

Hallam, S. (2013). The power of music: Its impact on the intellectual, social and personal development of children and young people. *International Journal of Music Education*, 28(3), 269-89.

Hallam, S. (2018). *The impact of music in everyday life: Psychology and the music industry.* Oxford University Press.

Hallam, S., Cross, I., & Thaut, M. (Eds.). (2016). *The Oxford handbook of music psychology* (2nd ed.). Oxford University Press.

Hallam, S., & Himonides, E. (2022). *The power of music An exploration of the evidence*. Open Book Publishers. p.314. Doi: https://doi.org/10.11647/OBP.0292

Hallam, S., Price, J., & Katsarou, G. (2009). The effects of background music on primary school pupils' task performance. *Educational Studies*, 35(2), 131-41. Doi:10.1080/03055690802648138

Hansen, J., & Hansen, J. D. (1990). *The psychology of advertising*. Routledge.

Hargreaves, D. J., Hargreaves, J. J., & North, A. C. (2012). *The social and applied psychology of music.* Oxford University Press.

Hargreaves, D. J., North, A. C., & Tarrant, M. (2005). The functions of music in everyday life: Redefining the social in music psychology. *Psychology of Music*, 33(4), 395-405.

Husain, G., Thompson, W. F., & Schellenberg, E. G. (2002). Effects of musical tempo and mode on arousal, mood, and spatial abilities. *Music Perception: An Interdisciplinary Journal*, 20(2), 151-71.

Juslin, P. N. (2013). From everyday emotions to aesthetic emotions: Towards a unified theory of musical emotions. *Physics of Life Reviews*, 10(3), 235–66. https://doi.org/10.1016/j.plrev.2013.05.008

Juslin, P. N. (2016). *Emotional responses to music*. In S. Hallam, I. Cross, & M. Thaut (eds.), The Oxford handbook of music psychology (pp. 197–214). Oxford: Oxford University Press.

Krause, A. E. (2014a). Choice and control in the music listening experience. *Journal of Consumer Research,* 41(2), 567-81. https://doi.org/10.1086/675691

Krause, A. E. (2014b). The role of perceived control over the music selection environment in shaping individuals' emotional and behavioral responses to music. *Journal of Retailing and Consumer Services,* 21(6), 986-95. https://doi.org/10.1016/j.jretconser.2014.08.012

Krause, A. E. (2015). I did it my way: Comparing the effects of various modes of music selection on individuals' responses to self-selected and experimenter-selected music. *Psychology of Music*, 43(5), 589-606. https://doi.org/10.1177/0305735613515339

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.

Martindale, C., & Moore, K. (1989). Priming, prototypicality, and preference. *Journal of Experimental Psychology: Human Perception and Performance*, 15(2), 331-40.

Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. The MIT Press.

Moradzadeh, L., Blumenthal, G., & Wiseheart, M. (2014). Musical training, bilingualism, and executive function: A closer look at task switching and dual-task performance. *Cognitive Science*, 39(5), 992–1020. https://doi.org/10.1111/cogs.12183

North, A. C., & Hargreaves, D. J. (2008). *The social and applied psychology of music*. Oxford University Press.

North, A. C., Hargreaves, D. J., MacKenzie, L. A., & Law, R. (2004). The effects of musical and voice "fit" on responses to advertisements. *Journal of Applied Social Psychology*, 34(8), 1675-708.

Oechslin, M. S., Ville, D. V. D., Lazeyras, F., Hauert, C.-A., & James, C. E. (2012). Degree of musical expertise modulates higher order brain functioning. *Cerebral Cortex*, 23(9), 2213-24. https://doi.org/10.1093/cercor/bhs206

Peretz, I., & Zatorre, R. J. (2005). Brain organization for music processing. *Annual Review of Psychology*, 56, 89-114.

Radocy, R. E., & Boyle, J. D. (1988). *Psychological foundations of musical behavior*. Charles C Thomas Publisher.

Rentfrow, P. J., & Gosling, S. D. (2003). The do re mi's of everyday life: The structure and personality correlates of music preferences. *Journal of Personality and Social Psychology*, 84(6), 1236-56.

Roden, I., Könen, T., Bongard, S., Frankenberg, E., Friedrich, E. K., & Kreutz, G. (2014). Effects of music training on attention, processing speed and cognitive music abilities—Findings from a longitudinal study. *Applied Cognitive Psychology*, 28(4), 545–57. https://doi.org/10.1002/acp.3034

Salimpoor, V. N., Benovoy, M., Larcher, K., Dagher, A., & Zatorre, R. J. (2011). Anatomically distinct dopamine release during anticipation and experience of peak emotion to music. *Nature Neuroscience*, 14(2), 257-62.

Schäfer, T., Sedlmeier, P., Städtler, C., & Huron, D. (2013). The psychological functions of music listening. *Frontiers in Psychology*, 4, 511. doi: 10.3389/fpsyg.2013.00511

Schellenberg, E. G., Nakata, T., Hunter, P. G., & Tamoto, S. (2007). Exposure to music and cognitive performance: Tests of children and adults. *Psychology of Music*, 35(1), 5-19.

Smith, J. K. (2008). *Interpretive inquiry*. In L. M. Given (Ed.), The SAGE encyclopedia of qualitative research methods (Vol. 1, pp. 433-435). Sage Publications.

Trainor, L. J., & Zatorre, R. J. (2016). *The neurobiology of musical expectations*. In S. Hallam, I. Cross, & M. Thaut (eds.), The Oxford handbook of music psychology (pp. 285–306). Oxford: Oxford University Press.

Völker, J. (2019). Personalising music for more effective mood induction: Exploring activation, underlying mechanisms, emotional intelligence, and motives in mood regulation. *Musicae Scientiae*, 25(4), 380–98. https://doi.org/10.1177/1029864919876315

Völker, J. (2021). Measuring emotional music experience: Spreading activation and BRECVEMA mechanisms. *Psychology of Music*, 50(2), 631–49. doi:10.1177/03057356211010224

Yerkes, R. M., & Dodson, J. D. (1908). The relation of strength of stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology*, 18(5), 459-82.

Zuk, J., Benjamin, C., Kenyon, A., & Gaab, N. (2014). Behavioral and neural correlates of executive functioning in musicians and non-musicians. *PLoS ONE*, 9(6), e99868. https://doi.org/10.1371/journal.pone.0099868

ETHICAL PERMISSION

In this study, all rules specified within the scope of the "*Higher Education Institutions Scientific Research and Publication Ethics Directive*" were followed. None of the actions mentioned under the title "*Actions Contrary to Scientific Research and Publishing Ethics*" which is the second part of the directive, have been carried out. This research is one of the studies that do not require Ethics Committee Approval according to ULAKBİM TR Index 2020 criteria.

LIMITATION

There is a scarcity of literature and experimental studies in the field of music psychology.

ACKNOWLEDGEMENT

The author has no support to report.

DISCLOSURE STATEMENT

No potential competing interest was reported by the author.

FUNDING

The author has no funding to report.