Journal of Psychology and Behavior Studies
ISSN: 2753-2364
DOI: 10.32996/jpbs
Journal Homepage: www.al-kindipublisher.com/index.php/jpbs

JPBS
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

Understanding Aesthetic Principles in Music and its Effect to Contemporary Music Composition: An Educational Psychology Perspective

Zhang Jianxin[1] ✉ Liu Wenhong[2], Li Yuli[3] and Xiao Ruihong[4]
[1234]*La Consolacion University Philippines*
Corresponding Author: Zhang Jianxin, **E-mail**: 315173608@qq.com

| ABSTRACT
The study aims to understand the aesthetics on music and its effect to contemporary music composition.This study will be structured on a descriptive correlational research design, where numeric score rating will be assigned to gather the perception of a specific respondent to observe a structured pattern. Quantitative research allows for objectivity, fast data collection and analysis of the data in statistical form that can provide a thorough overview of the study (Health Research Funding, 2018). Aside from the descriptive quantitative design, correlation will also be used to further understand how variables affect each other which are; Psychology of music aesthetics as the independent variable while contemporary music composition. Hence, according to I-Chant A. Chiang, Rajiv S. Jhangiani, and Paul C. Price, (2013), correlation research is a non-experimental research design in which two variables are measured and assessed on the aspect of their statistical relationship in strength and range. The study will focus on Academy of Chinese Traditional Opera, and Central Conservatory of Music, Beijing, China as the two study sites. The third year level students enrolled in music program are the respondents that have prior knowledge on Psychology of music aesthetics, and applies contemporary music composition as part of program requirements. Many respondents disagreed that the sound of contemporary music is a bop, and contemporary music's genre is not one of their choices. Most respondents disagreed that they often listen to contemporary music and shared that contemporary music does not have a good range of type of songs.

| KEYWORDS

Aesthetic Music; Contemporary Music; Music Intervention Program, Psychology of Music; Educational Psychology

| ARTICLE INFORMATION

ACCEPTED: 26 June 2024 **PUBLISHED:** 27 July 2024 **DOI:** 10.32996/jpbs.2024.4.2.2

1. Introduction

Traditionally, music has been studied as a human artifact, focusing to a certain degree on the structural analysis of the score and on the historical birth and fortune of the compositions. Though legitimate and useful, the structural and historical approaches take only partially into account the listener's experience while listening (Reybrouck, 2010). Apparently, during the times of greater uncertainty brought by unpredicted situations, such as those we lived during the Covid-19 outbreak (Baker et al., 2020), people sometimes pushed to reduced discomfort by conservatively dismissing alternative behaviors and avoiding information that disconfirms previously acquired beliefs, behaviors, or cognitions.

On the other hand, music as a special subject itself has the deepest power of the people. Music can wash and immerse the heart. Music course is also an important way to implement esthetic education in the process of quality-oriented education, which can better enrich students' minds, develop students' phenomenal power, and further enhance students' phenomenal space and creativity (Au and Lau, 2021). In addition, music can deeply affect students, help students form a correct attitude toward objective facts, enhance students' moral concepts and moral feelings, and better regulate students' behavior. The realization of these needs

to use the emotional guidance and cognitive concept of music, through the emotional and cognitive guidance of music psychology to better have a profound impact

Furher, according to Jia N and Yang C (2022), the approaches and methods of music psychology in the relationship between music emotion and cognition in music teaching activities. on students' thoughts, enhance students' good moral sentiment, increase wisdom and improve health, and promote students to develop good ideological morality (Topal et al., 2021). Music education is not only needed for the construction of socialist spiritual civilization, but also an important means to stimulate students' musical ability and individualized and comprehensive development. Based on this, from the perspective of music psychology, this essay deeply discusses the application path of the relationship between emotion and cognition in music teaching activities.

It is evident that almost every music educator is able to write, make simple drawings, record and copy these by using computers or is able to use his computer for watching and listening to visual or audio media products. But the computers provide two more technological possibilities for music teachers besides listening to music from CDs, playing mp3 tracks, watching videos, presenting visual materials with projectors: the ability to write notes and to record sounds. At present, there are many software options for notation and recording. But it is not possible for a teacher to learn and use all the software -which require a specific knowledge on their own- in detail. However the ability of each music teacher to use some programs accepted in the whole world at a definite level is also a necessity of the contemporary education approach. Based upon these, this study aimed to determine the software that is utilized or used and thought to be useful in music education. For this purpose, the accessible scientific reports, publications and Internet resources related to the subject are examined and a descriptive study was carried out based on the screening model. The data gathered together presented and suggestions were made.

2. Review of Related Literature

2.1 Psychology of Music Aesthetics

According to Xu and Xia (2022), aesthetic psychology plays an important role in the individual's aesthetic experience and judgment, and also affects the individual's ability to capture the beauty of the aesthetic object and improve the aesthetic ability. It has the characteristics of consciousness, individual differences and diversity. And the aesthetic psychology of different individuals at different stages has great changes, which will be affected by individual age structure, social experience, mental health status and cognitive level. As per Yu (2021), music appreciation education will have a positive impact on the physical and mental health of individuals, and make the nervous system become active under the stimulation of music, so as to show a better mental outlook externally. In music appreciation education, it is beneficial to cultivate individual aesthetics, improve individual aesthetic level, and make individual body and mind healthier through music singing training. Music appreciation education can also promote the improvement of individual intelligence, balance the development of left and right brain, and make the thinking more active and creative. Music appreciation education has a good effect on the venting of individual negative emotions. It can infect individual emotions through positive music, slowly put down the heart's preparedness, release their backlog of negative emotions, and open their hearts under the guidance of positive music to become positive and active, so as to improve individual emotional control ability. Long term music appreciation education will enrich individual emotion and help to improve individual aesthetic ability. However, college students are in a special stage of physical and mental development. Their emotions are easy to fluctuate. They have strong curiosity about the things around them. Their aesthetic consciousness has not been fully formed, and their aesthetic ability needs to be cultivated. Therefore, it is very necessary to carry out music appreciation education for students in universities.

Further, the researcher will investigate the effect of music appreciation teaching strategies combined with music psychology on students' learning psychology and learning outcomes through questionnaires and visits, and collated findings into data. The Korean lessons designed under the guidance of the psychological effect-based teaching strategy can be added to fully engage students' senses and enhance their emotional experience hence, the experimental class will be more motivated to learn and students will have better learning outcomes. The negative emotions that can be generated by students during their previous participation in music student teaching practices will be addressed accordingly.

2.2 Music, Mood and Movement Theory

Mood. The first theoretical statement for the MMM is that music produces the psychological response of altered mood leading to improved health outcomes. Based on the elements of rhythm, melody, pitch and harmony, music produces psychological responses within a person when it passes through the auditory cortex of the brain, which processes the music. This processing occurs in the limbic system, which is known as the centre of emotions, sensations and feelings. Human responses to music occur predominantly in the right hemisphere of the brain, which is involved in intuitive and creative methods of processing information (Tramo, 2001, as cited in Murrock and Huggins, 2009). Through affective response and cognitive recognition, music is able to alter mood. Thus, a person's current mood, response to the given music, and musical preference play an important part in mood alteration leading to various health outcomes. As a nursing intervention, music has been used across various cultures to alter mood (Nayak et al. 2000, Jeong & Kim 2007), decrease anxiety (Chlan 1995, Good et al. 1999, as cited in Murrock and Huggins, 2009),

and reduce depression (Siedliecki & Good 2006). Nurses have also tested music to decrease agitation in patients with dementia (Goodaer & Abraham 1994, Ragneskog et al. 2001, Hicks-Moore 2005, Sung et al. 2006). Only one study used the Theory of IMIA to decrease agitation in patients with Alzheimer's disease (Gerdner 2000, as cited in Murrock and Huggins, 2009). Thus, music altered mood to improve the health outcomes of anxiety, depression and agitation in various international patient populations.

Music can also alter mood when used as a type of auditory distraction. By helping a person pay minimal attention to an unpleasant stimulus, music can be used as a stimulus-substitution. For example, pain typically leads to a stress response that signals the release of epinephrine and nor-epinephrine, resulting in increased heart rate, respiratory rate, blood pressure, and state anxiety (Lazarus 1991, as cited in Murrock and Huggins, 2009). Music may interrupt this stress response as it is thought that listening to calming music releases beta-endorphins, the body's natural opioid pain relievers (McKinney et al. 1997, as cited in Murrock and Huggins, 2009). Several researchers have reported using a music intervention to decrease blood pressure, heart rate, respiratory rate and oxygen consumption during percutaneous coronary interventions (Chan et al. 2006), mechanical ventilation (Chlan et al. 2001, as cited in Murrock and Huggins, 2009) and for patients after heart attack (White 1999, as cited in Murrock and Huggins, 2009). Nursing studies that used music interventions based on the theory of pain: a balance between analgesia and side effects (Good 1998, as cited in Murrock and Huggins, 2009) have shown decreased surgical pain (Good et al. 1999, McCaffrey & Good 2000), labour pain (Phumdoung & Good 2003, as cited in Murrock and Huggins, 2009) and chronic knee pain (McCaffrey & Freeman 2003, as cited in Murrock and Huggins, 2009). By interrupting the stress response, music decreased blood pressure, heart rate, respiratory rate, oxygen consumption and pain.

Another way that music alters mood is by encouraging social interaction. As a means of socially acceptable self-expression, music plays an important role in the communication of feelings and group identity (Hargreaves et al. 1997, as cited in Murrock and Huggins, 2009). Because it is based on cultural experiences and expectations, music appeals to diverse groups of people regardless of language, economic, religious or educational factors. Music interventions conducted in group settings have resulted in improved social well-being, sense of belonging, companionship, and perceived psychological well-being among stroke survivors (Jeong & Kim 2007) and those with traumatic brain injury (Nayak et al. 2000). Therefore, music alters mood, leading to the improved health outcomes of decreased anxiety, depression, agitation, pain, altered physiological responses and improved social interaction.

Movement. The second theoretical statement for the MMM is the physiological responses to music are a cue for movement leading to the initiation and maintenance of physical activity. From the auditory cortex, the neural impulses of auditory rhythm stimulate the neural motor impulses, resulting in the auditory motor entertainment described in the RAS technique. The physiological mechanisms for this technique are based on interactions between auditory and motor systems, or sound and movement. As the first element of music, rhythm has important influences on motor control and function due to its recurring patterns and predictable cues. Rhythmic cuing leads to synchronization that determines timing, cadence and dynamics of physical movements (Thaut 1997, as cited in Murrock and Huggins, 2009). This occurs in both the upper and lower extremities, as demonstrated by finger and toe tapping. Studies based on the RAS technique have used music as an external time cue to regulate body movement and improve gait in adults with disabilities such as Parkinson disease (Thaut 1997, as cited in Murrock and Huggins, 2009) and stroke (Jeong and Kim 2007, as cited in Murrock and Huggins, 2009). Furthermore, relationship between musical rhythm and human movement has been shown to increase physical activity maintenance in patients with pulmonary disease (Bauldoff et al. 2002, as cited in Murrock and Huggins, 2009) and in healthy older adults (Hamburg and Clair 2003, as cited in Murrock and Huggins, 2009). Thus, music is an auditory cue for movement that can lead to the initiation and maintenance of physical activity in various adult populations.

Initiation and maintenance of physical activity. The third theoretical statement for the MMM is both the psychological response of altered mood and the physiological response of movement to music promotes the initiation and maintenance of physical activity leading to improved health outcomes. Although physical activity has been associated with the improved health outcomes of weight loss (Murrock & Gary 2008), weight management (Littman et al. 2005), reduced cardiovascular risk factors (Schneider et al. 2006), blood pressure management (Castaneda et al. 2002), blood sugar management (Kelley and Goodpaster 2001, as cited in Murrock and Huggins, 2009), and improved quality of life (Jeong & Kim 2007), initiation and maintenance of physical activity is difficult for many adults. Exercising to music can improve mood (Murrock 2002, as cited in Murrock and Huggins, 2009), and positive mood changes might influence an individual's intention to continue exercising. Thus, music has important implications for increasing physical activity. For the MMM, enjoyment is also an important component of mood alteration. Enjoyment of physical activity has been linked with decreased perceived effort and improved feeling states (McAuley et al. 2007), and enjoyment has been identified as a mediator between physical activity and positive mood changes (Motl et al. 2000, as cited in Murrock and Huggins, 2009). Enjoyment is defined as an optimal psychological state that leads to performing an activity primarily for its own sake, and is associated with positive feeling states, such as pleasure, liking, and fun (Csikszentmihalyi, 1990, as cited in Murrock and Huggins, 2009). Music interventions designed to increase physical activity should focus on promoting enjoyment as this is a reinforcement

of the behaviour and is critical to initiation and maintenance of a physical activity programme (Motl et al. 2000, as cited in Murrock and Huggins, 2009).

During physical activity, perceptions of discomfort and exertion occur through the peripheral cues of muscle discomfort and fatigue and through central cues of changes in heart rate, respiratory rate and oxygen consumption mediated by the autonomic nervous system. By distracting an individual's perception of exertion, music allows them to minimize the peripheral and central cues of discomfort (Szmedra & Bacharach 1998, Yamashita et al. 2006). Also, exercising to music can improve participation by capturing an individual's interest and connecting the physical activity with positive experiences. The positive experiences contribute to the initiation and maintenance of physical activity (Hamburg & Clair 2003, as cited in Murrock and Huggins, 2009). Furthermore, the relationship between rhythm and movement benefits skill acquisition and improved performance, regardless of an individual's fitness level. Music can lead to greater frequency, intensity and duration of physical activity (Tenenbaum et al. 2004, as cited in Murrock and Huggins, 2009) all of which are important for achieving the health outcomes. As a result, exercising to music can increase enjoyment, connect physical activity with positive experiences, improve frequency, intensity, and duration, and promote the initiation and maintenance of physical activity leading to the improved health outcomes of weight, blood pressure, blood sugar, and cardiovascular risk factor management, and improved quality of life.

2.3 The Importance of Aesthetic Taste in Music and Art for Our Perceived Identity

Within philosophy, psychology, and neuroscience, research on personal identity has tended to focus on certain traits such as memory or experience of agency. In ordinary life, however, the identities we construct and convey to others are often related to our preferences: the things we care about and like. Recently, this aspect of identity has been studied with a focus on moral values. A number of studies have suggested that changes in moral values are construed as changes in personal identity (Strohminger and Nichols, 2014; Prinz and Nichols, 2016; Heiphetz et al., 2017). But what about other kinds of values? Our daily life is replete with decisions that reflect our aesthetic values and preferences. What shall I wear? What shall I watch on television? What music shall I listen to? Some follow their favorite musician on social media and adapt further aesthetic preferences from them. Others invest time and significant resources to see art shows in museums. Our hypothesis in this paper is that aesthetic preferences and the arts could be also closely linked to the self and that a change in taste and aesthetic values may be construed as a change in who one is.

Philosophers of art have investigated that nature of taste and aesthetic judgment (Hume, 2000, [1739]; Zangwill, 2019), but there has been comparatively little work on the links between taste and identity. Here we explore this relationship with four experimental studies. We show that changes in taste are interpreted as changes in identity and we found that the degree of impact on identity varies with the degree of the aesthetic change. The self has many dimensions, but one seems to relate to the arts. As such, our findings suggest that the construction of identity includes our relationship to cultural artifacts. That bears on how we should think about the self — it may be more cultural than some theories have emphasized — and how we think about the arts — they are not merely forms of entertainment but also constitute important values we care about and that are central to us. Hence, we are aesthetic selves: central aspects of our identity are constituted by cultural and art-related preferences.

2.4 Prior Work Relating to Art, Aesthetics, and Identity

To our knowledge, there has been no work to date using psychological methods to explore intuitions about the relationship between aesthetic taste, the arts, and personal identity. Still, there is research that adds plausibility to our hypothesis.

First, there is much work in sociology on the nature of subcultures. Philosophers and cognitive scientists tend to focus on highly individual aspects of identity, such as autobiographical memories, but, for sociologists and some social psychologists, identity is more frequently associated with the social groups to which we belong, and these include groups united by taste in the arts. The most obvious examples come from music: youth subcultures such as goths, punks, and deadheads are conceptualized as contributing to identity (Hebdige, 1979). Sociologists have also traced connections between aesthetic taste and social class. For example, preference for classical (Katz-Gerro, 2002) or eclectic music (Peterson and Kern, 1996) might help one indicate one's social status. Similar things hold for art expertise and museum attendance (Bourdieu et al., 1990; Hanquinet, 2013). Such observations indicate that our taste can help us form social groups and signal to others who we are and where we stand in society. Related to this is the idea of aesthetic tribalism: Taste choices come in groups. If we share one aesthetic commitment with a social group we might unwittingly adopt more of their choices, aesthetic and otherwise, picking up its aesthetic convictions rather than consciously adopting them, which gives our aesthetic participation a highly social touch (Lopes, 2018). Interestingly, seminal research on "minimal group" formation also has used taste in paintings (Klee vs. Kandinsky) to induce preferential treatment of in-groups (Tajfel, 1970).

Second, there has been a substantial body of work examining links between personality traits and aesthetic interests for music and the arts. Studies into art preferences – the extent to which individuals like or dislike different styles of paintings – have represented

the dominant approach in the area of personality and art, no doubt because of the relative straightforwardness of classifying artistic products according to established schools. Even before personality traits were "invented" (i.e., prior to the development of trait taxonomies), psychological eminencies such as Burt (1933) and Eysenck (1940) examined personality differences in ratings of different paintings. Even today, empirical aesthetics is in no small part shaped by individual differences in taste and preference (Jacobsen, 2006). Factors such as "openness to experience" as well as other traits can be used to predict artistic preferences (Furnham and Walker, 2001; Chamorro-Premuzic et al., 2009; Swami and Furnham, 2014). Significantly less research has been devoted to the questions of how much aesthetic traits actually matter to us and to what extent we perceive them as being central to us as a person. There have been some claims regarding an "artistic personality" whose openness, curiosity, imagination, and creativity leads to a greater proclivity for aesthetic experiences (Chamorro-Premuzic et al., 2007). Yet the complementary question has, to our knowledge, never been studied: would a change in my preferences change me?

Third, there is recent evidence that moral values play a central role for our identity, prompting researchers to postulate a "moral self" (Strohminger and Nichols, 2014; Prinz and Nichols, 2016). Within philosophy, morals and aesthetics are regarded as the two main domains of value. Unlike "descriptive" domains, which capture how things actually are, normative domains describe how things should be, and terms of evaluation (such as good and bad) are used to assess cases that meet or violate those norms. In both morals and aesthetics, we make such evaluative judgments. This invites the question: If morals are important to identity, why not aesthetics? The link between morality and identity may relate to the fact that morality is emotionally charged (Greene and Haidt, 2002). We feel our moral values deeply, and experience intense emotions when they are instantiated or violated (Avramova and Inbar, 2013). The same might be true for aesthetic values. That we invest a lot of energy and resources to engage in aesthetic experiences of artworks or to encounter our favorite musicians and bands in concerts is already an indication that our aesthetic choices might in fact matter a great deal to us. It only seems plausible that our aesthetic taste is also important to who we are. It is this taste that determines the range of aesthetic objects and experiences we value. Similar to our moral evaluations of social situations aesthetic evaluations are also inherently affective. They are motivational states related to dispositions of our embodied and situated self to act on the world (Prinz, 2011; Fingerhut and Prinz, 2018a). This link of art and emotion (complementary to the moral-emotions link) provides a further reason to explore the possibility that aesthetic taste is related to identity.

These findings offer circumstantial reasons for hypothesizing an "aesthetic self." If preferences for certain arts are linked to social group membership, personality, and emotionally grounded values, then changes in our aesthetic preferences should be perceived as a threat to our identity and transform us. The main aim of this investigation is, therefore, to explore whether changes in aesthetic tastes actually exert an impact on perceived identity.

2.5 Aesthetic Experience of Music

An aesthetic experience of music is an important phenomenon worthy of scientific study as testified by questionnaire surveys pointing to enjoyment, beauty, and nostalgia as some of the foremost aesthetic reasons for listening to music (along with entertainment, company and the like; e.g., Laukka, 2007). Even the decision to play an instrument or to choose music as a profession often derives from aesthetic past experiences (Sloboda, 1992; Juslin and Laukka, 2004). In spite of its importance as well as its long history of philosophical and scientific investigation (for a review, see Brattico and Pearce, 2013), aesthetic experience is also one of the most poorly defined concepts in psychology and neuroscience (Juslin et al., 2010; Markovic, 2012). In this paper, utilizing neuroscientific evidence as a starting point, we aim at providing an explicit definition of this phenomenon and its components organized in temporal order. In parallel, we discuss the questions yet unsolved or left open by the available evidence and suggest hypotheses for further testing.

Until recent years, investigations of music within the field of cognitive neuroscience have focused on instrumental music particularly from the Western classical repertoire. The proportion of studies focusing on classical instrumental music, though, is quickly decreasing as in the past few years researchers have been increasingly exploring brain responses to other musical genres as well (e.g., Limb and Braun, 2008; Janata, 2009; Berns et al., 2010; Brattico et al., 2011; Johnson et al., 2011; Montag et al., 2011; Pereira et al., 2011; Salimpoor et al., 2011; Zuckerman et al., 2012; Alluri et al., in press). Cognitive neuroscientists have typically considered music as a perceptual and cognitive phenomenon to be compared to language, memory, attention, and other human cognitive functions (e.g., Peretz and Zatorre, 2003; Koelsch and Siebel, 2005). Until now, the neurosciences of music have given very little attention to the aesthetic aspects of the musical phenomenon, like judgments of the value of music as a form of art (cf. Brattico and Pearce, 2013). Recent attention, however, has been devoted to musical emotions though with clearly divergent views on the kinds of emotions that music truly generates and how these emotions are evoked (see, e.g., Juslin and Västfjäll, 2008; Konecni, 2008; Zentner et al., 2008). Here, we provide a novel perspective of the musical phenomenon as an instance of the aesthetic experience triggered by an object or an external event without an intrinsic survival function. In doing so, we integrate cognitive and affective and decision-making processes related to music in a single mental act, namely the aesthetic experience. Furthermore, following the concept of mental chronometry in associating cognitive operations to brain events happening in real time (Donders, 1869; Posner, 2005), we propose that this aesthetic musical experience consists of a cascade of mental processes in an individual

(alone or together with others) occurring at a precise moment in time. We consider not only classical instrumental music consumed in a concert hall but also other very common aesthetic phenomena centered around music, such as ushering at a live pop/rock concert or watching opera. Our descriptions mainly concern the aesthetic experiences of Western individuals as little is known about the content and conceptualization of those experiences in isolated non-Western cultures. We also provide working hypotheses that could help solve outstanding issues on the nature of musical emotions and of the musical phenomenon in its multimodal complexity.

According to Chatterjee's (2011) fresh conceptualization, aesthetics includes "the perception, production, and response to art, as well as interactions with objects and scenes that evoke an intense feeling, often of pleasure." Markovic (2012) instead specifically proposes a definition of an aesthetic experience as an "exceptional state of mind," in which focused attention plays a crucial role, and which responds not to bodily needs (such as appetitive and mating functions) but provides "pleasures for the mind" (p. 2). In our recent review on neuroesthetic studies of music (Brattico and Pearce, 2013), we define an aesthetic experience of music "as one in which the individual immerses herself in the music, dedicating her attention to perceptual, cognitive and affective interpretation based on the formal properties of the perceptual experience." Aesthetic processing, namely information processing of an artistic object (see, e.g., Jacobsen, 2006), comprises receptive (sensory), central (emotional, perceptual, and cognitive), and productive processes. Aesthetic experience, as defined here and elsewhere (e.g., Leder et al., 2004; Shelley, 2012), comprises only receptive and central processes, resulting in emotions, appreciation, and judgment of a sensorial entity, such as a musical piece, with respect to one or more relevant concepts (like beauty, elegance, rhythm, mastering of performance, and so on). Production is not in the focus of this framework although it might constitute a minor aspect (humming along with a song, tapping with a foot, etc.).

The components of a given aesthetic process are governed by situational and individual characteristics. They also change over time because they are affected by biological and cultural evolution, by technical possibilities and by fashion (together referred to as diachronia). Within a given time, cultural, subcultural, and group factors (together referred to as ipsichronia), determine aesthetic processing as well as specifics of a given content domain (Jacobsen et al., 2004; Jacobsen, 2006, 2010; Brattico et al., 2009; Istók et al., 2009). Here we propose a novel approach in which the components of an aesthetic experience are not static but dynamic modules. The model conforms to an information processing view in which mental events are defined both spatially, namely associated with specific neural locations or networks, and temporally, evolving in time as the outcome of distinct neural mechanisms. (We refer the reader to Figure 1 as a guide to the temporal order of events in the aesthetic experience and the related brain structures). We propose that complete actualization of a musical aesthetic experience requires a particular (aesthetic) attitude, intentionality, attention, and the appropriate context. When those are present, the aesthetic experience comes to full fruition by inducing emotions in the individual (particularly aesthetic ones, defined below; for emotion concepts used in this framework, please see Table 1), by prompting an evaluative judgment of, e.g., beauty, and by determining liking and a time-lasting preference. Hence, by identifying putative temporally and/or spatially quantifiable subprocesses with the help of evidence obtained with functional magnetic resonance imaging (fMRI), positron emission tomography (PET), magnetoencephalography (MEG), and electroencephalography (EEG) as well as from brain-lesioned patients, we provide a workable definition of the musical aesthetic experience for future investigations. Particularly, in our proposal we define three main outcomes of the musical aesthetic experience: aesthetic emotions (e.g., enjoyment, interest, nostalgia), aesthetic judgments (namely, the appraisal of the beauty of a musical piece or the evaluation of the perfection and efficacy of a musical performance), and preference (for instance, the liking or disliking of a piece or a musical genre). All these outcomes of a musical aesthetic experience require perceptual, cognitive, and early emotional reactions to music to come into existence. However, of the three, only aesthetic emotions consist mainly of affective processes, whereas aesthetic judgments and preference include also evaluative, cognitive, and decisional processes. In the following sections, we elaborate on the subprocesses that constitute a musical aesthetic experience along with the underlying neural mechanisms and proposed temporal succession.

2.6 Aesthetic Judgments

Aesthetic judgment (also sometimes termed appraisals) can be viewed as a special type of conscious evaluation typically directed at a human composition (like a musical piece or a painting) but also sometimes toward a natural object or event (a sunset, lightning, and so on). In musical and visual domains alike, the central component of such a judgment is the positive or negative outcome based on beauty or other criteria that the community considers relevant for the decision process (Jacobsen et al., 2004; Istók et al., 2009). Based on the results of a free-associations questionnaire, music-specific dimensions, such as melody, rhythm, harmony, and affective potential, are also important, particularly in musicians (Istók et al., 2009). Indeed, criteria for aesthetic judgments of music vary according to the style and the corresponding community of reference (e.g., von Appen, 2007). For example, criteria for aesthetic judgments of hip hop music are certainly divergent from those underlying the aesthetic appraisal of classical jazz music; to simplify, the former may rely on verbal complexity and the matching between word prosody and rhythm (e.g., Shusterman, 1991), whereas the latter may be judged based on the performer's virtuosity, the mastering of jazz harmony rules, and the originality of improvisation (e.g., Gioia, 1988). The definition of these aesthetic criteria, including specific stylistic standards, is the

aim of entire disciplines and is marginal to our purpose of unveiling the mental and neural chronometry of the aesthetic experience of music. Nevertheless, for our aims, it is important to notice that each listener has implicitly or explicitly internalized the rules and conventions of the musical style with which she is most familiar. In the words of Gallese and Freedberg (2007), "such processes might be precognitive and not always dependent on perception informed by cognition and cultural stock (as in much traditional aesthetics)" (p. 411). Taking this into account in our model, aesthetic judgment mainly follows cognitive processing of style-specific standards, as indicated by our psychophysiological findings (Müller et al., 2010; see Figure 1). The process of judging music according to certain criteria, an activity common to all listeners that sometimes only happens implicitly, is highly dependent on intentionality as well as external and internal contexts as we will illustrate later in this paper.

Aesthetic judgments, early emotional responses, and discrete emotions of music may be intertwined and hard to separate in a linear chronological sequence at the neural level. A very recent EEG and behavioral study purposely investigated one kind of aesthetic judgment of music, namely the attribution of positive or negative value according to the beauty dimension (Müller et al., 2010) and how it interacts with cognitive processing and emotional responses to sounds. After listening to 5 s chord sequences in which the last chord was manipulated in compliance with the rules of Western harmony, subjects were prompted by a visual cue to answer either the question "Is it beautiful?" or "Is it correct?" A late positive potential (LPP), lasting from 600 to 1200 ms after the last manipulated chord, was observed during both judgments but was larger when subjects judged beauty than when they judged correctness. In previous literature, the LPP has been associated with motivated, valenced attention to visual faces (Hajcak et al., 2006), erotic pictures (Briggs and Martin, 2009), words, and abstract black and white shapes (Jacobsen and Höfel, 2003). The larger LPP to beauty versus correctness chord judgments obtained by Müller et al. (2010) thus indicates an affective, motivational component in the computation of beauty judgments for chords. Furthermore, in a study of Japanese subjects using PET to measure brain metabolic activity, Suzuki et al. (2008) found that part of the dopaminergic reward system, namely the dorsolateral midbrain regions, was activated by listening to and rating the beauty of consonant chords irrespective of their major or minor keys (hence irrespective of their sad or happy emotional qualities) when contrasted with rating ugly dissonant major or minor chords. This finding was stronger with minor consonant chords, whereas the beauty ratings (contrasted with ugly ratings) of major consonant chords correlated with activity in the middle temporal gyrus. The authors interpret this result *post hoc* by associating minor consonant chords with additional pleasurable feelings in Japanese listeners due to a cultural preference bias for minor music. The issue is, nevertheless, still open since the neural correlates of the aesthetic chord judgments were not studied separately from those of the affective responses to them. In the subsequent sections of this paper, we capitalize on neuroimaging findings obtained with more complex musical sequences to propose separating the two processes of aesthetic emotions and judgments both in time, i.e., occurring in a specific temporal order, and in space, i.e., activating distinct neural systems.

What seems to distinguish aesthetic judgments of musical beauty from those in other domains (like in visual arts or literature) is the triggering of motion in the listener (e.g., Patel, 2008). It is a common observation that when we find a musical piece interesting or beautiful, we are motorically entrained, tap along with the beat, change our facial expressions, and (when possible) start to dance, sing, or play along. A musical experience, whether it consists of listening, performing, or dancing, is hence conceptualized as encompassing the whole body. This broad conception of music falls within the modern philosophical and neurobiological framework of embodied cognition (Lakoff and Johnson, 1980; Varela et al., 1992; Damasio, 1995), which posits that the human presence in the world and its cognitive understanding are mediated by the body and by the mutual interaction between different bodies and cognitive entities. Hence, applying the concept of embodied cognition to musical activities, some have proposed that the transfer of physical sound energy to the mental representation of music is embodied and requires motor and somatosensory body engagement (Molnar-Szakacs and Overy, 2006; Leman, 2007). An fMRI study by Kornysheva et al. (2010) provided empirical evidence for the engagement of premotor brain circuitry during aesthetic judgments. Eighteen subjects with little or no musical education were asked to give beauty or tempo judgments of slow to fast rhythmic patterns differing in beat subdivisions and played alternatively by wooden drums or metal drums. The contrasts between rhythms judged as beautiful and those judged as non-beautiful showed activation of the ventral premotor cortex and the cerebellum. In our framework, induction of motor activity and other physiological and bodily changes accompanies the flow of aesthetic processes.

Interestingly, prefrontal areas like the superior frontal gyrus (BA 10) and the middle frontal gyrus (BA 9) of the orbitofrontal cortex coupled with the anterior cingulate cortex (BA 24) are recruited for beauty judgments of musical rhythms (Kornysheva et al., 2010). The explicit orientation of the subjects to process sounds aesthetically contrasted with instructions to focus on the tempo of the stimuli is sufficient to activate the orbitofrontal areas. Orbitofrontal cortex activation has previously been observed for situations that required the cognitive monitoring of events and sensory stimuli, which implicates this brain structure in aesthetic contemplation. It is important to note that the same regions of the brain, in particular the anterior orbitofrontal cortex (BA 10) coupled with the anterior cingulate cortex (BA 24), are also active during ratings of preference or beauty of faces, paintings, or geometrical shapes, and even during contemplation of paintings (Jacobsen et al., 2006; Kim et al., 2007; Cupchik et al., 2009). It has been suggested that these brain regions mediate cross-modal integration between subjective hedonic experience, visceral or bodily sensations, and evaluative judgment (Kringelbach, 2005).

The significance of the orbitofrontal cortex in aesthetic judgment has received support from other neuroimaging studies. A recent pivotal fMRI experiment by Ishizu and Zeki (2011) showed that a very small region of the medial orbitofrontal cortex, the A1 field, is activated by beautiful musical pieces and paintings (contrasted with ugly ones). A linear relationship between activation of A1 was even found with the intensity of the beauty experience. These findings led the authors to propose that the *aesthetic judgment* of beauty is hardwired in a specific brain area of the frontal lobe: anything activating that brain area would be experienced as beautiful. Such results confirm the need to broaden the classical comparison made between music and language (see, e.g., Peretz and Zatorre, 2003; Patel, 2008) to include other aesthetic domains like the visual arts, dance, and literature.

Two recent meta-analyses have identified several areas consistently involved in aesthetic appraisal and other aesthetically positive experiences. Brown et al. (2011) utilized a voxel-based meta-analysis of 93 imaging studies to identify brain regions activated by positive aesthetic appraisals across four sensory modalities. Areas including the supplementary motor area, dorsomedial thalamus, anterior insula, medial orbitofrontal cortex, and midbrain were active for positively judged auditory stimuli. An area in the right anterior insula was common to all sensory modalities (auditory, gustatory, olfactory, and visual). Although they did not find evidence of activity in the insula, Kuhn and Gallinat (2012) examined common areas activated by subjective positive judgments, including attractiveness, liking, or beauty, across 39 studies, and found regions of the ventromedial frontal lobe (including the orbitofrontal cortex), the anterior cingulate cortex, the left ventral striatum, the right cerebellum, and the left thalamus. While the identification of these areas as part of an aesthetic cross-modal circuit represents an advancement of the neuroesthetics field of research, the discrepancies between the two meta-analyses likely derive from the inclusion of a number of different types of aesthetic processes and modalities, thus highlighting the need for their analytic determination.

2.7 Aesthetic Emotions

Aesthetic emotions, such as awe, being moved, enjoyment, nostalgia, and chills or frissons, are, according to some scholars, the true emotions that can be induced (not simply expressed or perceived) by music (e.g., Konecni, 2008). The definition of aesthetic emotions, though, is still under debate. For instance, while not mentioning them explicitly, Koelsch (2010) argues for the legitimacy of musical emotions, as opposed to the artificiality of aesthetic ones, because they are controlled by the same brain structures associated with everyday emotions triggered by life events. Similarly, Juslin et al. (2010) oppose the use of the concept of aesthetic emotions when it is merely associated with any emotion evoked by a piece of art or when it represents refined emotions lacking goal relevance and action drive. As already briefly mentioned by Suzuki et al. (2008), aesthetic emotions should be regarded as distinct from other discrete emotions, such as sadness and happiness, as well as from aesthetic judgments. In the literature, they have been identified as emotions triggered by a work of art, i.e., in a context devoid of any obvious material effect on the individual's wellbeing. In that sense, they have been contrasted with utilitarian or everyday emotions, which involve appraisal of the situation in relation to the individual's goal and action oriented coping (Zentner and Eerola, 2010). In our recent work (Brattico and Pearce, 2013), we offer a compromise. Drawing on Sloboda's (2010) distinction of music in everyday life versus in an aesthetic context, we suggest that casual (often inattentive) listening to music in everyday situations mainly induces basic emotions. Conversely, when a piece of music is listened to within an aesthetic context or performed with an aesthetic attitude (such as in a concert hall), special kinds of emotion might be generated, such as enjoyment, awe, and nostalgia. These can be considered truly aesthetic emotions.

We also propose that, as opposed to discrete emotions, which can be perceived and induced quickly after a very brief musical excerpt, aesthetic emotions are slow and often require listening to the piece of music as a whole. Their processing hence follows feature analysis, early emotional reactions, cognitive processing of musical rules, and discrete emotions (see Figure 1). In line with this, retrospective post-performance ratings could be considered as optimal for measuring experienced aesthetic emotions: they allow for the recollection of the entirety of an aesthetic event (although this would be biased toward the peak and ending experiences) and an assessment of its expressivity, and thus of its ability to induce discrete emotions (e.g., Juslin and Laukka, 2004; Laukka, 2007; Zentner et al., 2008). Zentner et al. (2008) asked over 800 attendees of a summer music festival in Genève to rate the appropriateness of a list of 66 adjectives in describing the emotions experienced during a performance. Very interestingly, according to confirmatory factor analyses, the 9-factor domain-specific model that best fit the listeners' ratings included emotions that have been often described as aesthetic: wonder, nostalgia, transcendence, tenderness, peacefulness, power, joyful activation, tension, and sadness. Most of these emotions were positive, and even the sadness factor did not include aversive aspects typical of its utilitarian counterpart, such as feelings of gloominess or depression. The authors (Zentner et al., 2008; Zentner and Eerola, 2010) directly compared the 9-factor model to the basic emotion model, ascribing the differences between them to the specific properties of music. According to our proposal, time is crucial in accounting for the differences, as we will illustrate below.

Following Leder et al. (2004), we propose that aesthetic emotions and aesthetic judgments are the two outcomes of aesthetic processing. We further suggest that aesthetic emotions, when they are successfully triggered by music, succeed feature analysis, early emotional responses, and particularly core "liking," cognitive processing, and discrete emotions in this temporal order. In particular, discrete emotions in music are quickly perceived, induced (when possible), and assessed to determine the musical

expressivity of a performance, which, in turn, might affect the induction of aesthetic emotions. Such a prediction stems from the currently sparse literature and calls for targeted empirical testing. In sum, we agree with Juslin et al. (2010) that an aesthetic emotion does not necessarily accompany an aesthetic judgment (there termed "response") and that it has to be distinguished from conscious liking or preference (see below). In music, discrete and aesthetic emotions seem to be of central importance since aesthetic judgment is not necessarily explicitly present, such as in the common situation of incidental listening. Aesthetic emotions have been repeatedly indicated to be one of the primary reasons for wanting to attentively listen to music (Juslin and Laukka, 2004; Laukka, 2007; McDonald and Stewart, 2008), and even for choosing music as a profession (Sloboda, 1992).

An important type of aesthetic emotion is enjoyment. Similar to humor, music experience might be characterized by cognitive and affective elements (e.g., Moran et al., 2004). In humor, the cognitive element refers to understanding the disparity between the punch line and previous experience, whereas in music it might consist of detecting the violation of expected events (e.g., Huron and Margulis, 2010; Vuust and Kringelbach, 2010). The affective element may consist of the enjoyment derived from understanding the joke or the music. During this enjoyment moment, both in humor and in music, the perceiver experiences visceral and emotional reactions. FMRI and PET studies have demonstrated that musical pleasure recruits neural networks involved in the experience of reward and pleasure, including the ventral striatum (particularly, the caudate nucleus and the nucleus accumbens) and the orbitofrontal cortex (Blood and Zatorre, 2001; Koelsch et al., 2006; Salimpoor et al., 2011). These brain structures are active even when subjects passively listen to enjoyable music (as resulting from post-scanning tests) without being required to rate its pleasantness (Brown et al., 2004). Indeed, in depressed people, who have a decreased capacity for pleasure and enjoyment, favorite music compared to neutral music elicits significantly less activation of the ventral striatum than in healthy people, as evidenced by fMRI measurements (Osuch et al., 2009).

In music, a very strong aesthetic emotion of enjoyment in a listener or performer can sometimes be accompanied by certain bodily changes, such as chills, or goose bumps. We only briefly touch upon chills here, but extensive research has investigated this phenomenon (for a recent review, see Huron and Margulis, 2010). Although rare in occurrence (Huron, 2006; Juslin et al., 2010), these physiological responses represent an important bodily marker of emotional peaks (Grewe et al., 2009) and subjective enjoyment of music (Salimpoor et al., 2009). The neural correlates of chills during music listening have been discovered by way of PET and fMRI (Blood and Zatorre, 2001; Salimpoor et al., 2011). The intensity of chills, as measured by polygraph (e.g., heart rate, breathing, skin conductance, body temperature, blood volume pulse amplitude) and subjective ratings of pleasure, were correlated with activity in a broad network of brain regions including the ventral striatum, orbitofrontal cortex (BA 14), insula, anterior cingulate, cerebellum, supplementary motor area, and dorsal midbrain (possibly the periacqueductal gray), whereas it was negatively correlated with activation in the hippocampus, amygdala, cuneus, precuneus, and medial prefrontal cortex (BA 10 and 32). The subcortical regions associated with chills, such as the ventral striatum and periacqueductal gray, are also linked with pleasure in other mammals (Panksepp, 2009–2010). In a study in which the time course of the brain activity was investigated, the peak intensity of chills was positively correlated with dopamine release in the nucleus accumbens; on the other hand, anticipation, or the time immediately preceding peak pleasure, was correlated with activity in the caudate nucleus (Salimpoor et al., 2011). This highlights the importance of expectancy and anticipation in an emotional experience of music, as also emphasized by Vuust and Kringelbach (2010). Chills can be considered a subjective response, being highly variable between individuals, but some sensory features have been proven to relate with the chill response, such as high-pitched sustained crescendos similar to those characterizing the separation calls of neonates, sudden changes in harmony, and other musical events disrupting the expectations for incoming sounds based on previous musical knowledge. Thus, within our framework, chills are considered to be a physiological response at the interface between the automatic hardwired responses to sensory features of core "liking" and the subjective processes of the aesthetic emotion of enjoyment.

The aesthetic emotion of nostalgia (for empirical studies of the emotional aspects of nostalgic experiences, see Wildschut et al., 2006; Janata, 2009; Trost et al., 2012) induced during music listening has also received the recent attention of neuroscientists and music psychologists. Indeed, the memory associations with life events that happened during a music listening experience dictate a strong emotional, both experiential and physiological, response to music (Juslin and Västfjäll, 2008). According to Konecni (2008), the aesthetic experience of music is determined in large part by episodic memory, with nostalgia considered the most important, and perhaps the only, emotion truly induced by music. Elicitation of memories and nostalgia are listed among the main reasons for listening to music and for the strongest bodily changes in both elderly and young adults (Laukka, 2007; McDonald and Stewart, 2008). The neural correlates of specific autobiographical memories associated with a musical piece have recently been investigated by Janata (2009) with a naturalistic paradigm. During fMRI scanning, subjects listened to 30 s excerpts of 30 pop and R&B songs (also containing lyrics) dating from their extended childhood (341 unique song excerpts across subjects) and rated them according to affective and autobiographical association scales. After fMRI scanning, subjects identified those songs that were judged as autobiographically salient and rated the strength of the associated emotional memories. The left dorsal medial prefrontal cortex (BA 8/9) reacted to the degree of autobiographical salience of the songs, likely establishing an association between structural tonality aspects and retrieval cues. Listening to autobiographically salient songs recruited both the left ventrolateral prefrontal

cortex (particularly BA 44/45), also activated by structural violations of music (Tillmann et al., 2003; Koelsch et al., 2005), and the posterior cingulate gyrus, associated with other autobiographical memory tasks involving effortful retrieval demands. Hence, the findings demonstrate the power of music to evoke vivid memories and nostalgia. In doing so, music activates in a natural, spontaneous way the frontal network previously associated with effortful tasks in which subjects were required to retrieve episodes cued by single words or images (e.g., Svoboda et al., 2006). Further studies are needed, though however, to relate these activation patterns to the role of lyrics or melodies in nostalgia and autobiographical memories of music. For instance, using O15 PET to compare episodic versus semantic activations by familiar and unfamiliar melodic tunes, Platel et al. (2003) obtained similar but right-sided activations of the superior (BA 11) and medial (BA 8/9) frontal gyri along with the precuneus (BA 7); follow-up studies may elucidate whether this lateralization difference might be ascribed to the use of only melodic stimuli in Platel et al. (2003) as opposed to vocal music in Janata (2009).

Silvia (2005) has proposed the appraisal theory of emotion to account specifically for aesthetic emotions. This theory posits that a specific emotion stems from the adaptive outcomes of the evaluation or appraisal of an event in relation to a personal goal (Ellsworth and Scherer, 2003). For example, if the process results in the appraisal of an event as obstructive to personal goals, then an action tendency will result from high sympathetic nervous system arousal (Scherer et al., 2003); in contrast, if the appraisal is that it will be easy to cope with a situation, then the event does not control the emotion system and the individual can establish a new equilibrium (Ellsworth and Scherer, 2003). A first automatic appraisal, related to the assessment of whether a situation could be potentially dangerous for wellbeing, happens through a fast subcortical route similar to a reflex (Niedenthal et al., 2006). During fast appraisal the sensory valence and arousal of sound stimuli are processed, whereas a slow, cognitive appraisal relies on cortical processes for the evaluation of the individual's capacity to cope with a situation (Niedenthal et al., 2006). According to Silvia (2005), a positive aesthetic emotion and judgment derives from the subjective appraisal of events according to the fulfillment of personal goals. For instance, interest, an aesthetic emotion deriving from the appraisal of novelty or complexity, combines with coping potential for the subjective feeling of being able to understand something that is new and complicated. However, it is known that the subjective conscious appraisal of discrete emotional states in faces is mediated by medial prefrontal cortex activation (e.g., Rubino et al., 2007). In the context of his Imagination, Tension, Prediction, Reaction, and Appraisal theory (ITPRA), Huron (2006) (see also Huron and Margulis, 2010) also indicates appraisal as an important affective mechanism in an aesthetic context independent of goal attainment: the immediate early emotional reactions that are caused, e.g., by a loud or dissonant chord (the latter resonating with the acoustic characteristics of screams or distress calls), are appraised in the musical context, which is harmless to the listener. Hence, an initial automatic negative reaction to a sad piece would be reframed within the aesthetic context and would hence produce the positive joyful feeling of aesthetic enjoyment. Similar to what we have conceived regarding aesthetic emotions, such an appraisal process is slower than the initial affective reactions to sounds and could be either conscious or below the level of awareness.

In sum, aesthetic emotions in our proposal succeed and integrate earlier affective processes, such as core "liking," arousal, and other early emotional reactions, as well as perception, induction, and recognition of discrete emotions, leading to a (supposedly) longer-lasting emotional and bodily reaction. In line with Konecni (2008), we suggest as a working hypothesis that the longer timeframe of aesthetic emotions may sometimes be equal to that of mood induction processes.

2.8 Contemporary Music

Contemporary Music Review, implies a special relationship with music history. Rather than foreground genre, idiom, location, period or technique, the adjective 'contemporary' seems to stake out boundaries at the edge of time. Unlike other historical periods, the contemporary needs neither beginning nor end. Once invoked, the contemporary can simply persist; it is less a specific place *in* time than an abstract relation *with* time, the coordinates, capacities and tensions of which interpellate an observer with a particular perspective *on* time. Understood in this sense, the contemporary can just as easily involve distance as it does presence; just as easily direct attention backwards as it does forwards. One thing that is clear is that the contemporary now has its own history—a malleable one depending on which historians and theorists one chooses to believe, but evidently extending backwards as many as 36 years in the case of this journal alone. And as the contemporary ages, the work of invoking or enacting it increasingly involves answers to questions about abstraction and representation. We might think about the writing of music history as entailing a similar challenge to identify the reasons *why* particular events, figures, ideas and works attained dominance while others seemed futile; and indeed why we today might, in particular cases, feel inclined to resettle old scores or redirect old narratives. Unfortunately, this kind of reflection rarely operates at a higher level than arbitrary revision. Some of the recent 'new materialist' interventions, for instance, seem to offer a similar kind of reassurance as the plot of *Interstellar*; the comfort in knowing that there have always been exceptions to the historiographical mistakes of sexism, speciesism, strict canonicity or Western supremacy. These authors are relieved to find that the 'modest witness' of modern science was never anything more than a web of partial and ephemeral contingencies (Haraway 1997, 24; cf. Piekut 2012). Digitally remediated recordings and archival sources seem to lend new meanings to past certainties just as they reshape our cherished senses of scholarly responsibility and critical distance (Walton 2015). Mapping the past as a network of relations across heterogeneous collectives of humans and nonhumans makes

'the music itself' return 'with a difference' (Piekut 2014, 213). Significantly, what these interventions promise is not novelty but, as Emily Dolan has written, a kind of renewal, a vehicle to convey musicology *back* to long-established passions and rigours, 'whereby we can recast the loving adoration of musical culture as a new kind of worthy intellectual engagement' (Dolan 2015, 91). Inter-dimensionality, remember, brings Cooper not forward but *back* to a time when progress was still possible. The point, it seems, is to get back to the work of winning.

2.9 Technology

Technology is ubiquitous. Thus, it is hardly surprising that it has had a profound influence on the art of music in the twentieth century. It has altered how music is transmitted, preserved, heard, performed, and composed. Less and less often do we hear musical sound that has not at some level been shaped by technology: technology is involved in the reinforcement of concert halls, the recording and broadcast of music, and the design and construction of musical instruments. Many church organs, for example, now use synthesized or sampled sounds rather than actual pipes; instruments are now available that have what look like piano keyboards and make what sound like piano timbres, but which are actually dedicated digital synthesizers; virtuoso performers whose instrument is the turntable are now part of not only the world of disco but also the world of concert music (John Zorn, for example, has written a piece for voice, string quartet, and turntables). Technology is changing the essence of music, although many musicians still do not appreciate the extent of its influence. Technology came to music with the advent of recordings. Thomas Edison invented a crude cylinder phonograph in 1877. By the end of the nineteenth century, companies in the United States and England were manufacturing disc recordings of music. Prior to recordings, home consumption of all music-whether composed for keyboard or not-was by means of private piano performance. The possibility of preserving musical performances by recording utterly changed the social and artistic meanings of music. The invention of the tape recorder a half century later made sonorities not only reproducible but also alterable. The resulting techniques allowed recorded sounds to be fragmented, combined, distorted, etc. Such manipulations could affect not only sound qualities but also timespans. By changing recording speeds, for example, a composer of musique concr?te could compress a Beethoven symphony into a single second or make a word last an hour.

Consider Hal Freedman's composition Ring Precis, from the mid '70s. Freedman has taken a recording of the entire Ring cycle of Wagner-some eighteen hours of music-and arbitrarily cut it up into three-minute segments, all of which are played simultaneously.[2] The resulting sound is, doubtless, utterly unlike anything you have ever heard, but I am more interested in the temporal implications of Freedman's compositional procedure. He has compressed by superimposition eighteen hours into three minutes, and thereby created a new piece out of an old one. Today, because of electronic technology, we listen to unaltered music only rarely. The sounds we hear have been not only performed by musicians but also interpreted by audio engineers, who have reinforced the acoustics of concert halls, spliced together note-perfect recorded performances, created artificially reverberant performance spaces, projected sounds across the world via satellite broadcast, greatly amplified rock concerts, and created temporal continuities that never existed "live." The audio engineer is almost as highly trained as the concert performer, and can be just as sensitive an artist. Recording technology has forced us to reconsider what constitutes a piece of music. It is unreasonable to claim that the printed score represents the musical sounds. The score usually gives no indication of how the audio engineer should manipulate his/her variables. Two differently mixed, equalized, and reverberated recordings of the same performance can contrast as much as two different performances of the same work. Today, splicing is done electronically, with far greater sophistication and flexibility than previously imaginable. As a result, recording and performance are diverging into two separate art forms. When we listen to a fine live performance, we get caught up in the sweep of the experience. If we subsequently hear a recording of the same performance, we may be disappointed, because the excitement of live performance-partly visual and partly visceral-cannot be captured on audio tape. Furthermore, if there are a few wrong notes or rhythms in a live performance, who cares? But even a small number of clinkers on a recording-which will be heard again and again, in a more detached way than concert listening-can be maddening. Thus recorded performances seek perfection, while live performances seek immediacy.

2.10 Computer Music in Modern Composition

Music has long been regarded as the most sophisticated and creative language throughout the world. It is accomplished by It conveys emotions in a direct and palpable way, but the inner details can be elusive to catch or feel. Over the past years, music is generally composed by a small group of people with artistic talents. However, since music is composed of a set of interconnected patterns, it can also be an excellent test field for mathematical, computational, and artificial intelligence methods. As technology evolves, a new generation of frameworks and techniques are emerging for creating music automatically yet intelligently. The algorithmic composition utilizes multiple programming languages and computer software to generate music, including GarageBand, Chordbot, and TonePad. Several artificial intelligence advances, such as machine learning, neural networks, and evolutionary computation, are also put into effective use in the realm of music composition to reinforce creativity and promote innovations.

Since the United States and The United Kingdom in the 1940s have produced a real sense of the electronic computer, with the end of the Second World War, these computers with powerful computing power was soon used by scientists of all disciplines for

analysis, research work. Similarly, musicians who are trying to break new ground in music are beginning to use this tool in their music. At first, the electronic computer was first used in the analysis and research of music theory, and it has a very good auxiliary role in the analysis of the style, tonality and harmonic structure of music works. After a series of experiments, American composer Richard Hillel and mathematician Leonard Isaac created the first true "computer music" in 1957. After 70 s, computer music shows the trend of accelerated development. Many computer music laboratories have been set up in the United States and Western Europe. Some internationally renowned universities have also set up special research institutes and published some monographs and periodicals. Since 1974, an international computer music conference has been held every year around the world. The International Computer Music Association was also formed in 1975, with the publication of Computer Music Magazine. The Stockholm Acoustical Conference has been held every ten years since 1983. Since 1992, an international symposium on musical acoustics has been held every three years, covering all aspects of computer music and musical acoustics. In Asia, Japan and China have also established a number of small computer music laboratories, the use of computer composition, computer technology for sound sampling and editing has been widely used. After the 1980s, with the continuous improvement of synthesizer technology, the further expansion of electronic technology to the digital direction, and later the emergence of MIDI technology and the popularity of personal computers, computer music began to move towards the popularization and commercialization. At the same time, of course, electronic acoustic music based on audio synthesis is also developing at an amazing speed with the help of digital technology. Since the mid-1990s, the development of computer music has been unstoppable. Digital technology has penetrated into almost all fields of computer music. Because of the microcomputer operation speed and multimedia function continuously upgrade and the development of professional audio interface, sequencer for computer software has been greatly improved, can not only make it easier to handle the MIDI data, and can handle audio information at the same time, become a sequencer, multi-track recording, processing, indented blended with a variety of functions such as to music workstation software. At the same time, a large number of software recording programs and software audio sources and software effects for computers have emerged, and most of them have superior performance, some even better than the original hardware equipment. With these audio sources, effects, recording, mixing and other software music software and professional audio card, it is completely possible to complete all the programs from musical instrument playing, audio recording, texture arrangement, audio modulation to CD burning independently on the computer. At this point, it really realized the way of music creation with computer as the core tool.

There have been many efforts to explore the possibilities that music technology offers in education, in spite of the synchronous nature of music performance (Dammers, 2009). This limited review includes thirty-four peer-reviewed research articles that investigate different ways music technology can be integrated into music education. From “traditional” uses such as online research (Barry, 2003), streaming audio/video (Cox, 2005) and traditional music notation software (Schroth, Helfer, & Dammers, 2009) to Skype lessons (Dammers, 2009) and Dance eJay (Gall & Breeze, 2005 and Mellor, 2008), the results are categorized and discussed. From the results, it is clear that while technology does offer many possibilities for the music educator, the paradigm of music research must be shifted to clearly state study objectives and to include audio/video material, as well as relevant sheet music in order for educators to truly absorb the information and gauge the efficacy of the use of the technology. In 2009, Dammers summed up the conundrum of using Information and Communications Technology (ICT) in the field of music education, stating that because music performance is, by its very nature, synchronous, the use of ICT is problematic at best (Dammers, 2009, p. 22). Many collegiate programs are embracing the possibilities of asynchronous online education (research rather than performance), but music programs are not generally moving in that direction (Dammers, 2009, p. 22). This does not mean that technology is not being used in music education, but it does shape how it is being explored and implemented from the primary level through higher education. Before examining how technology is being used in music education, it is necessary to lay out parameters for the term. Rees (2001) defined music technology as “the systematic study of tools and techniques for music production, performance, education, and research” (Rees, 2011, p. 154). This article will deal primarily with education and research, showing how music technology – and more specifically ICT within the field of music – is being used to shape opportunities for music students of varying ages, skills and backgrounds. It will then turn to a discussion on the importance of clearly stated objectives within the research framework and consider an inherent problem in the manner in which the findings are presented.

Although it is practically impossible to deliver synchronous music education (Dammers, 2009), that does not mean that there is no possibility for online music programs in higher education. In 2003, Barry (2003) developed and evaluated web-based components for a graduate music education research course, with Phase I delivering web-based instruction in blocks and Phase II alternating web and traditional instruction (after receiving student feedback) (Barry, 2003). In 2001, Bauer (2001) integrated web-components into a traditional music education methods course to investigate student attitudes towards asynchronous instruction with generally positive responses (Bauer, 2001). At the high school level, an internet-based study unit was created with the purpose of teaching high school choral students vocal anatomy, with results showing that students’ knowledge was successfully increased and that they were comfortable learning this way (Ryder, 2004, p. iv). In 2003, DeVries studied the use of ICTs in primary classrooms in Australia and found that most teachers were using CDs for song repertoire as well as modeling the singing for their students (DeVries, 2013, p. 5). Teachers also used other kinds of multimedia, including DVDs, video, the television and websites. However, more recent kinds of ICT (i.e. tablets or musical digital toys) were rarely used, with lack of knowledge and cost as the major

constraints (DeVries, 2013, p. 5). Another 2015 study looked at a small group of students using video in a much more creative manner. After the teacher showed her class a twenty minute segment of the Metropolitan Broadcast (originally recorded live in high definition) of Mozart's opera, The Magic Flute, students clamored for more and ended up watching the entire opera over the course of eight weeks (Acker, Nyland, & Niland, 2015, p. 68). The class began incorporating the storyline of the opera into their dramatic playtime and even had discussions about the symbolism in the opera (Acker et al., 2015, p. 68). The MET Broadcasts are filmed and broadcast live, with an incredibly high quality in video and sound, which makes it possible to engage students in the closest thing to a live performance as possible. This study clearly shows that these young students were engaged by the use of ICT in the classroom and took it far beyond simply "watching a video." While the students were not able to watch the broadcast live, they were able to get a similar experience in their classroom – as long as there is equipment set up with a teacher who knows how to use it.

2.11 Electronic Music

The work and performances of electronic ensemble HyperSense Complex (Burton, 2003; Langley, n.d.; Riddell, 2005, n.d.; Riddell, Langley, & Burton, 2002– 2005) also exemplify sensory/gestural musical interaction for trained/professional performers and musicians utilising wearable motion-sensor controllers. Another electronic ensemble, The Hub (Bischoff et al., 1987–present; Brown, n.d.; Early Computer Network Ensembles, n.d.) is responsible for advancing the field of 'Computer Network Music'—a genre of electronic/electroacoustic music which explores the potentialities of enabling multiple performers to collaborate and interact with each other in improvisational composition and performance through a shared, connective ICMS via individual user interfaces or instruments. In this instance, The HUB itself acts as the central computer juncture through which each of the participating members can connect via a wired local network. Global String (Plohman, 2000; Tanaka, n.d.; Tanaka & Toeplitz, 1998–2001) is another example of an ICMS representative of Computer Network Music. In contrast to the HUB, however, the system was designed not for use by a specific ensemble of musicians involved in its development, but as a gallery installation for public use. In developing Global String, Tanaka and Toeplitz expanded upon the ideas established by The Hub through the use of the internet as the central juncture through which a potentially infinite number of remote users could interact with the users in the installation performance-space. The installation consisted of a physical string connected to a virtual string network, which would transfer analogue pulses of the real string, measured by vibration sensors and converted to digital data to any users actively connected to the virtual string network.

There are numerous other approaches to ICMS design that have contributed greatly to the development of HCI in music throughout its history but have become less common in recent years; likely due to the increasing influence of popular electronic music upon the area. Inter-Harmonium (Miranda, n.d.a; Miranda & Brouse, 2005a), BCMI-Piano (Miranda, n.d.b; Miranda & Brouse, 2005a, 2005b) and Eunoia (Chow, 2013; Park, 2013; Park, n.d.; synthhead, 2014b) are all exemplary of brain–computer interfacing systems and are reliant upon a technique known as Electroencephalography, or EEG, which is used to measure brain-patterns as voltage fluctuations by attaching sensors to the scalp.

Audulus (Holliday, 2011–present; Subatomic Software Audulus, 2014) and Jasuto (Wolfe, 2008–present) are both music-creation applications that do not incorporate the use of any two-way communicative capabilities between user and computer. Like Reactable, they are both modular in their design; allowing users to connect different sound-source/effect objects, etc. together to create virtual instruments and the like. Jasuto is focused entirely on synthesis, while Audulus offers greater potential for experimentation with not only sound-design but also control of external instruments, MIDI devices, etc. and is more like a stripped-down, simplified version of the modular programming environments Max/MSP (Puckette, 1988–present) and Pure Data (Puckette, 1996–present). Both of these systems aim to provide intermediate-level electronic musicians with an introductory route into the areas of modular sound-design and visual programming, respectively—in particular Audulus, which allows for novice programmers with little or no experience to explore the creative potentialities of working within a modular programming environment and to incorporate this into their music-making process without the need to undergo the extensive learning-curve required to gain a relative level of knowledge and proficiency with regards to the visual programming languages used in Max/MSP and Pure Data.

The bulk of these studies looked at the use of music software in composition projects. Software such as Mixcraft (Minott, 2015, p. 261) and Dance eJay (Gall & Breeze, 2005 and Mellor, 2008, p. 451) were used by secondary students in putting together music compositions, with focus on how students used the technology to create the compositions, the effects of formal instrumental music instruction on the strategies used by the students and also looking at the creative process from the viewpoint of defining exact what it means to be musically creative (Mellor, 2008, p. 451). While the bulk of the studies concerned secondary students, Mills and Murray looked at "good use" of ICT in ages eleven to fourteen, stating that this group is often neglected, (Mills & Murray, 2000, p. 29). In all of these studies, students did not use music notation, and generally worked with "pop" sound loops (Minott, 2015, p. 268 and Mellor, 2008, p. 457) or loops prepared in advance for the study (Gall & Breeze, 2005, p. 420). In higher education, a study concerning the student perceptions of MIDI (music instrument digital interface) was conducted in 2001 (Airy & Parr, 2001). A key concept in many of these studies was the idea of "democratizing" the compositional process (Ward, 2009, p. 154), and a

fascinating study in New Zealand showed how this democratization can lead to unlocking the potential of "troubled" student with positive results (Bolton, 2008). There was evidence of studies in other European countries that followed these same lines. In Italy, a study looked at the interaction between children and musical machines in children aged three to five (Addessi & Pachet, 2005, p. 21), with attention paid to the use of an improvisatory set up. Another study in Sweden followed eight-year-old children creating music with a synthesizer and music software (Nilsson & Folkestad, 2005).

Alternative Histories of Electronic Music, convened at the Science Museum in London in April 2016, invited its delegates to question 'familiar narratives' of male, elite, Western dominance in the field and create new historiographical spaces for 'little-known individuals, institutions, or artefacts, perspectives absent from "standard" accounts (however defined), and/or promising methodological approaches such as those found in science and technology studies' (Mooney, Schampaert, and Boon 2017, 144). Note how the term 'alternative' is used here with a distinctly additive inflection: the possibilities for concatenation must be infinite—we can no longer place limits on our understanding of music history. The organisers are quick to point out that their account is 'not motivated by a desire to reject previous scholarship on electroacoustic music's history', but rather 'to serve as an illustration that all history is contingent: no account can be complete in every detail; none can accommodate all viewpoints, or interrogate all sources' (ibid). The consensus seems to be that we might overcome our despair about the bad old days of music and musicology simply by extracting more resources from an ever-expanding archive: we can reject the singularity of the objective gaze and rest well knowing that more will always be better; indeed, that more and better are all we can ever have.

2.12 Elements of Music Composition and Recent Advances

To delve into the rationale behind computer music, it would be critical to analyze a piece of music by looking at its "genetic" makeup (Fu, 2021). It has been universally accepted that musical compositions consist of a sequence of highly-organized patterns, such as rhythm, melody, and accompaniment. By diversifying the pitch, timbre, speed, and intensity, the countless combinations of these three elements have entailed different music genres and given rise to a significant amount of musical works throughout the world. The study of Fu (2021) on musical elements is a rapidly growing research area and forms the basis of computational models of its composition. Therefore, this section would elaborate on the task of making music through the process of establishing the rhythm, creating the melody, and arranging the accompaniment.

Rhythm. refers to the connection between notes and rests, and encompasses the pattern of sound, silence, and emphasis to make music move and flow (Liu and Thing, 2017). It also regulates the length and strength when notes are played to invent various notes durations and types of accents (Liu and Ting, 2017). In computer music, it is not easy to find the appropriate rhythm for each tune due to the wide range of arranging notes to the beats. However, in recent years, there is a growing number of new research achievements about technological innovation in academic circles. Wang et al. introduced an integrated fitness function and utilized statistical results to access the rhythms. Patterns rated with a higher fitness value will serve as the foundation for future computer music models (Wang et al., 2020) Towsey et al. built a genetic algorithm based on extracted rhythmic features from world-famous pieces, and improved music arrangements in aspects of note density, rhythmic variety, and syncopation (Towsey et al., 2001).

Apart from applying computational tools to evaluate rhythms, scientists even endeavored to create them automatically using computer software and more advanced algorithms. Yamamoto et al. established a GA to simulate rhythms and fill in gaps as drum beats (Yamamoto et al., 2011) Other studies used neural networks to model rhythms and provide the backbone for the entire group. For example, Chen et al. (2001) presented a neural network to learn the input rhythms and then generate patterns accordingly. These fruitful scientific researches have transferred music composition to a task of recombining and reassigning notes and rests, thereby rearranging the rhythm in the same way.

Melody. is a sophisticated arrangement of musical tones that are organized as an aesthetic entity (Liu and Thing, 2017). Most compositions contain multiple melodies created by respective instruments and they are woven together to make the piece sonically pleasing. The melody usually includes two essential components:

1) *Pitch.* It means the quality of a sound controlled by the rate of vibrations from an instrument. This task also involves the range of instruments or vocals, the sequence of pitches, and harmony of the
concurrent pitches.

2) *Duration.* It denotes the length of time that each note will be played for and closely relates to the pace and feel of any music. Computer music also takes melody into account and innovates ways of generating surprisingly intriguing melodies. The most common methods include producing the whole piece in a single time, construct the melody note by note, and mimicking the structure of music input. Some research suggests to use algorithms to produce the tunes at random and then select the good ones. Yoon developed an interactive evolutionary system to produce music clips based on musical seed data (Chen et al., 2001).

Osana extracted features on pitch and duration from music samples and created an automatic composition system using GA melody (Fuji et al., 2011)

Accompaniment. is another crucial part to support or complement the music, and it might come in as single notes, chords, or other tunes. It serves to enhance the expression of compositions and help the audience feel the harmony. The inherent regularity of accompaniment and its cohesion to the main melody bring out computational intelligence's superiority into full play. Acevedo applied GA to find the counterpoint of music samples and eventually build the main accompaniment. It is noted that the accompaniment was subject to certain rules, such as the length of each note and the intervals should imitate those of the input melody, without destroying the overall atmosphere (Garay, 2020). Onisawa also constructed an interactive GA system to create chord templates, which could evolve according to the listener's feedback (Yoon, 2004).

In summary, computer music has penetrated each element of music composition, and is expected to exert a stronger influence with more intelligent tools coming into play.

2.13 Significance of the Study

The study is intended to be the beneficial for the following:

Students. The learners will be benefited from the study in understanding psychology of music during music class, and enhance their contemporary music composition through the guidance of their music teachers.

Teachers. The study can be an avenue for music educators to learn the students appreciation level in the aesthetics of music. It can also be a basis for improving their approach in teaching contemporary music composition by means of an organized intervention program.

Administrators. This study will support the school decisions for an intervention program to continuously update the knowledge and skills of music program teachers.

Future Researcher. The outcome of the study can be used as reference for future researchers to utilize mixed method research to have a better understanding and output of this study that can be a significant contribution to the body of knowledge.

3. Theoretical Framework

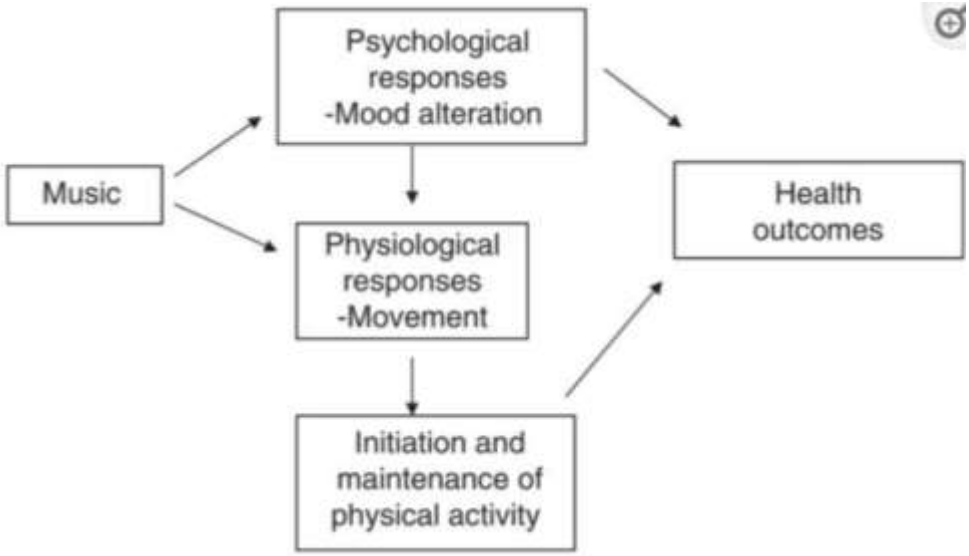

Figure 1. Framework of MMM Theory

The study will be anchored to the theory of music, mood and movement to improve health outcomes (Murrock and Higgins,2009). Murrock and Higgins (2009), synthesized by combining the psychological and physiological responses of music to increase physical activity and improve health outcomes. It proposed that music alters mood, is a cue for movement, and makes physical activity more enjoyable leading to improved health outcomes of weight, blood pressure, blood sugar and cardiovascular risk factor management, and improved quality of life.

Another interesting topic that can also be a theoretical foundation of thes study is the elements of music composition and recent advances (Fu, 2021) that adopted music theory of Heinrich Schenker (1868–1935). Fu (2021) summarized the latest technical developments in computer music and its real-life applications in music compositions. Fu (2021) gave a brief overview of the elements of music compositions, namely rhythm, melody, and accompaniment, and the recent research work in respective areas. It then goes into the current progress and applications of computer music. Overall, Fu (2021) strengthened the idea that computer music plays an integral role in transforming traditional modes of composition and diversifying ways of creating music.

3.1 Conceptual Framework

Using the variables from the mentioned theories the researcher formulated an operational model that will be utilized for the objectives of this study. Based from the preceding framework, the proposed study presents its concept map as illustrated in Figure 2.

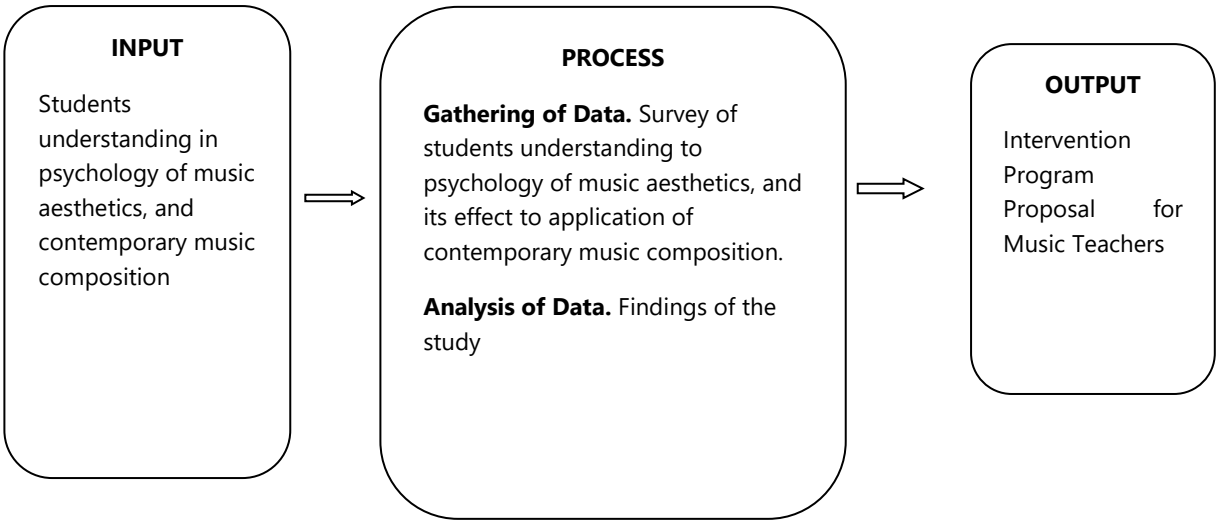

Figure 2. Conceptual Framework of the Study

The theory has given all the basic components of a research study on understanding the aesthetics on music and its effect to contemporary music composition. Based on the theoretical framework, the conceptual framework identified the relationship of the variables in the study as shown in Figure 2 above is an illustration of the input-process-output utilized in this study. First, Input covered the students understanding in psychology of music aesthetics, and contemporary music composition. Second, the Process described the students understanding to psychology of music aesthetics, and its effect to application of contemporary music composition, this study will lead to an intervention program proposal which is the Output. This process helped the researcher follow the method of the research.

3.2 Statement of the Problem

The study aims to understand the aesthetics on music and its effect to contemporary music composition.
Specifically, it will sought to answer the following questions:

1. How do the students describe their understanding in psychology of music aesthetics in terms of:
    1.1 Mood;
    1.2 Movement; and
    1.3 Initiation and maintenance of physical activity?
2. How do the students rate the contemporary music composition as guided by their music teachers?
3. Does the students description to psychology of music significantly affect their contemporary music composition?
4. What intervention program can be proposed for music teachers based on the findings of the study?

3.4 Definition of Terms

These key terms will be given the following conceptual and operational definitions for better understanding of the study.
The following terms will be defined in both conceptual and operational manner.

Aesthetics of music. It refers to the branch of philosophy that deals with the nature of art, beauty and taste in music, and with the

creation or appreciation of beauty in music.

Contemporary Music Composition. In this study, it refers to the music performed and created by the music students that is considered rhythmically, harmonically, and textually current with the aid of the existing learning management system for the music program.

Initiation and maintenance of physical activity. Beginning and continuing a physical activity programme with music over a period of time

Mood. It refers to the effect of music played in the background to establish a mood of relaxation, calm, etc.

Movement. It refers to the activities that uses a range of sensory modalities such as vision, hearing and movement to support music learning in a fun and engaging way.

Music Intervention Program. It refers to the activity providing information about the composers, the instruments and ensembles, and the different styles of music from an era as parts of the program.

Psychology of music. It refers to the branch of both psychology and musicology.

3.5 Scope and Delimitation of the Study

The respondents of the study are the music students enrolled in the two music schools namely; Academy of Chinese Traditional Opera, and Central Conservatory of Music, Beijing China. The study will focus on the identified parameter of the study which are; psychology of music aesthetics in terms of mood, movement, and initiation and maintenance of physical activity. In addition, the students rating to their contemporary music composition will be included in the study towards an intervention program proposal for music teachers. The total number of students enrolled in Music course on the two music schools will be determined for the sample size of the study. This study will be conducted during the Calendar Year 2022-2023.

3.6 Methods and Techniques Used

This study will be structured on a descriptive correlational research design, where numeric score rating will be assigned to gather the perception of a specific respondent to observe a structured pattern. Quantitative research allows for objectivity, fast data collection and analysis of the data in statistical form that can provide a thorough overview of the study (Health Research Funding, 2018). Aside from the descriptive quantitative design, correlation will also be used to further understand how variables affect each other which are; Psychology of music aesthetics as the independent variable while contemporary music composition. Hence, according to I-Chant A. Chiang, Rajiv S. Jhangiani, and Paul C. Price, (2013), correlation research is a non-experimental research design in which two variables are measured and assessed on the aspect of their statistical relationship in strength and range.

A purposive sampling technique will be used in this research, whereas this sampling technique according to Hameed (2016), allows the researcher to select a particular setting and respondents to participate in the research. For this study, the respondents as participants are third year level students enrolled in Academy of Chinese Traditional Opera, and Central Conservatory of Music, Beijing China. Furthermore, the researcher will compute for the sample size using the sample size calculator by raosoft.com where the confidence level will be set into 95% and a 5% margin of error will be expected. The total number of the enrolled third year level students in music program at Academy of Chinese Traditional Opera, and Central Conservatory of Music, Beijing China will be needed for the researcher to calculate the final sample size.

3.7 Respondents of the Study

The study will focus on Academy of Chinese Traditional Opera, and Central Conservatory of Music, Beijing, China as the two study sites. The third year level students enrolled in music program are the respondents that have prior knowledge on Psychology of music aesthetics, and applies contemporary music composition as part of program requirements.

3.8 Data Processing and Statistical Treatment

The Statistical Package for Social Sciences (SPSS) version 25, the data that will be gathered in this research will be analyzed through descriptive analysis to describe the understanding of the students to Psychology of music aesthetics, and their application of contemporary music composition. Furthermore, the SPSS v.25 Correlation analysis will be applied to The study aims to determine the effect of the psychology of music aesthetics to the students application of contemporary music composition. Guided by the statistician, data may be subjected to test of normality to consider the distribution of data, and know what statistical formula will be used, normal data distribution results will be analyzed with the use of Pearson-r and non-normal data distribution results will be computed with Spearman-rho.

Calculated mean scores per indicator with verbal interpretation as well as the total mean score will be applied for description on psychology of music aesthetics, and contemporary music composition. The instrument will use a 4-point rating scale in which the respondents expressed their degree of agreement or disagreement on given indicators using the following responses which were stated on the table below.

4. Presentation, Analysis and Interpretation of Data

This chapter presents analyses and interpretations of the study's data. The data are presented in the order and sequence of the questions raised in Chapter 1 for clarity and consistency in the discussion: (1) How do the students describe their understanding in psychology of music aesthetics in terms of mood, movement, initiation and maintenance of physical activity? (2) How do the students rate the contemporary music composition as guided by their music teachers? (3) Does the students description to psychology of music significantly affect their contemporary music composition? And (4) What intervention program can be proposed for music teachers based on the findings of the study?

4.1 How do the students describe their understanding in psychology of music aesthetics in terms of:

Table 2: Students Response with their Understanding in the Psychology of Music Aesthetics

Indicators	Weighted Mean	Verbal Interpretation	Rank
A. Mood			
1. It helps me think about myself.	2.32	Disagree	2
2. It leads my thoughts to somewhere else.	2.40	Disagree	1
3. It makes me believe I am better able to cope with my worries.	2.25	Disagree	3
4. It helps me better understand my thoughts and emotions.	2.13	Disagree	5
5. It helps me think about my identity.	2.22	Disagree	4
Average	**2.26**	**Disagree**	**3**
B. Movement			
1. It makes me sing while listening to a music.	3.04	Agree	2
2. It gives me the urge to dance.	2.92	Agree	4
3. It makes me feel positive when I feel like loosing to a contest.	2.99	Agree	3
4. It is a means to express myself whenever I am happy or sad.	3.14	Agree	1
5. It helps me find my own way to learn when studying.	2.82	Agree	5
Average	**2.98**	**Agree**	**2**
C. Initiation and Maintenance of Physical Activity			
1. I can express my thoughts that I cannot share in words.	2.99	Agree	4
2. I can escape from my tiring daily routines.	3.14	Agree	1
3. I can forget the problems in the environment that surrounds me.	3.02	Agree	3
4. I can put fantastic images or stories in my head.	2.99	Agree	4
5. I feel the energy I need for the day.	3.10	Agree	2
Average	**3.05**	**Agree**	**1**
Overall Weighted Mean	**2.76**	**Agree**	

Table 2 shows the numerical data of the students' respond with the psychology of music aesthetics applied by their school in terms of mood, movement, and initiation and maintenance of physical activity. Pertaining to the table, the three aspects of got an overall weighted mean of 2.76 and is interpreted as "Agree".

4.1.1 Mood

In this section, it quantifies the students' response with the psychology of music aesthetics applied by their school in terms of mood. On rank one having the highest weighted mean of 2.40 and a verbal interpretation of "Disagree", It leads my thoughts to somewhere else. Followed by It helps me think about myself on rank two with a weighted mean of 2.32 and an interpretation of "Disagree". On rank three, It makes me believe I am better able to cope with my worries with a weighted mean of 2.25 and an interpretation of "Disagree". Then on rank four with 2.22 and interpreted as "Disagree", It helps me think about my identity. Lastly,

having the lowest weighted mean of 2.13 and interpreted as "Disagree", It helps me better understand my thoughts and emotions. Overall, the students' response with the psychology of music aesthetics applied by their school in terms of mood corresponds to a weighted mean of 2.26 and a verbal interpretation of "Disagree".

4.1.2 Movement

In this section, it quantifies the students' response with the psychology of music aesthetics applied by their school in terms of movement. On rank one having the highest weighted mean of 3.14 and a verbal interpretation of "Agree", It is a means to express myself whenever I am happy or sad. Followed by It makes me sing while listening to a music on rank two with a weighted mean of 3.04 and an interpretation of "Agree". On rank three, It makes me feel positive when I feel like losing to a contest. with a weighted mean of 2.99 and an interpretation of "Agree". Then on rank four with 2.92 and interpreted as "Agree", It gives me the urge to dance. Lastly, having the lowest weighted mean of 2.82 and interpreted as "Agree", It helps me find my own way to learn when studying. Overall, the students' response with the psychology of music aesthetics applied by their school in terms of movement corresponds to a weighted mean of 2.98 and a verbal interpretation of "Agree".

4.1.3 Initiation and Maintenance of Physical Activity

In this section, it quantifies the students' response with the psychology of music aesthetics applied by their school in terms of initiation and maintenance of physical activity. On rank one having the highest weighted mean of 3.14 and a verbal interpretation of "Agree"; I can escape from my tiring daily routines. Followed by I feel the energy I need for the day on rank two with a weighted mean of 3.10 and an interpretation of "Agree". Then on rank three with 3.02 and interpreted as "Agree", I can forget the problems in the environment that surrounds me. Lastly, having the lowest weighted mean of 2.99 and interpreted as "Agree", I can express my thoughts that I cannot share in words and I can put fantastic images or stories in my head. Overall, the students' response with the psychology of music aesthetics applied by their school in terms of initiation and maintenance of physical activity corresponds to a weighted mean of 3.05 and a verbal interpretation of "Agree".

4.2 How do the students rate the contemporary music composition as guided by their music teachers?

Table 3: Ratings of the Students on their Contemporary Music Composition

Indicators	Weighted Mean	Interpretation	Rank
1. Contemporary music's genre is one of my choices	2.13	Disagree	3
2. The sound of contemporary music is a bop	2.03	Disagree	1
3. Contemporary music has a good range of type of songs	2.32	Disagree	5
4. Variety of music in contemporary music matches my various moods	2.40	Disagree	7
5. I often listen to contemporary music	2.16	Disagree	4
6. My everyday "go to music" are songs from contemporary music	3.19	Agree	15
7.Music nowadays eases my mind whenever listening to it	2.77	Agree	11
8. Today's music is comforting me whenever I can feel stress	2.76	Agree	10
9. Contemporary music helps me fall asleep	2.85	Agree	12
10. Songs composed as contemporary music are well known	2.72	Agree	9
11.Listening to contemporary music makes me dance	2.40	Disagree	7
12. Contemporary music has a nice flow of rhythm	2.13	Disagree	3
13. Contemporary music has a good musical arrangement	2.49	Disagree	8

14.Contemporary music are likely to be performed by people live	2.92	Agree	13
15. Contemporary music satisfies my likes when it comes to music	3.14	Agree	14
Overall Weighted Mean	**2.56**	**AGREE**	

Table 3 shows the numerical data of the ratings of the students to their application of contemporary music composition guided by their music teachers. Staring on rank one, with a weighted mean of 2.03 which has the lowest mean the sound of contemporary music is a bop and interpreted as "Disagree". Followed by contemporary music's genre is one of my choices and contemporary music has a nice flow of rhythm both on rank three, with a weighted mean of 2.13 and a verbal interpretation of "Disagree". On rank four, I often listen to contemporary music with a mean score of 2.16 and interpreted as "Disagree". Contemporary music has a good range of type of songs was in rank five with a mean score of 2.32 and a verbal interpretation of "Disagree". On rank seven, with a mean score of 2.40 and a verbal interpretation of "Disagree" was variety of music in contemporary music matches my various moods and listening to contemporary music makes me dance. Contemporary music has a good musical arrangement has a weighted mean of 2.49 and interpreted as "Disagree" was on rank eight. Songs composed as contemporary music are well known was on rank nine having a weighted mean of 2.72 and a verbal interpretation of "Agree". Followed by rank ten was today's music is comforting me whenever I can feel stress with a mean score of 2.76 and interpreted as "Agree". On rank eleven music nowadays eases my mind whenever listening to it has a weighted mean of 2.77 and a verbal interpretation of "Agree". Contemporary music helps me fall asleep with a mean score of 2.85 was on rank twelve and has a verbal interpretation of "Agree". On rank thirteen with a weighted mean of 2.92 was contemporary music are likely to be performed by people live and a verbal interpretation of "Agree". Contemporary music satisfies my likes when it comes to music was on rank fourteen with a mean score of 3.14 and a verbal interpretation of "Agree". Lastly, my everyday "go to music" are songs from contemporary music was interpreted as "Agree" on rank fifteen with a weighted mean of 3.19. Overall, of the ratings of the students to the comptemporary music composition applied by their music teachers has a general weighted mean of 2.56 and has a verbal interpretation of "Agree".

4.3 Does the students description to psychology of music significantly affect their contemporary music composition?

Table 4: The Effect of Psychology Of Music Aesthetics To Contemporary Music Composition.

Analysis of Variance (ANOVA)						
Source of Variation	**Sum of Square**	**Degree of Freedom**	**Mean of Square**	**Computed F**	**P-value**	**F crit**
Treatment	0.97	2	0.48	93.28	0.00	5.14
Errors	0.03	6	0.01			
Total	**1.00**	**8**				

The analysis of variance in Table 4 for the significant effect of the psychology of music aesthetics to contemporary music composition application revealed that since the computed F of 93.28 is greater than the critical value of 5.14 with the degree of freedom of 2 and 6 and level of significance of 5% thus the null is rejected. Therefore, the psychology of music significantly affect the students application of contemporary music composition.

4.4 What intervention program can be proposed for music teachers based on the findings of the study?

Since the students understanding to psychology of music aesthetics has a significant effect to their application of contemporary music composition therefore, there is a need to propose an intervention program that can be beneficial for students, teachers, and school administrators.

5. Summary of Findings

The following are the major findings of the study:

5.1 Students Understanding in the Psychology of Music Aesthetics

With the factor regarding mood, at rank one having the highest weighted mean of 2.40 and a verbal interpretation of "Disagree", It leads my thoughts to somewhere else. Followed by It helps me think about myself on rank two with a weighted mean of 2.32 and an interpretation of "Disagree". On rank three, It makes me believe I am better able to cope with my worries with a weighted mean of 2.25 and an interpretation of "Disagree". Then on rank four with 2.22 and interpreted as "Disagree", It helps me think about my identity. Lastly, having the lowest weighted mean of 2.13 and interpreted as "Disagree", It helps me better understand

my thoughts and emotions. Overall, the students' response with the psychology of music aesthetics applied by their school in terms of mood corresponds to a weighted mean of 2.26 and a verbal interpretation of "Disagree".

On the factor of movement, rank one having the highest weighted mean of 3.14 and a verbal interpretation of "Agree", It is a means to express myself whenever I am happy or sad. Followed by It makes me sing while listening to a music on rank two with a weighted mean of 3.04 and an interpretation of "Agree". On rank three, It makes me feel positive when I feel like losing to a contest. with a weighted mean of 2.99 and an interpretation of "Agree". Then on rank four with 2.92 and interpreted as "Agree", It gives me the urge to dance. Lastly, having the lowest weighted mean of 2.82 and interpreted as "Agree", It helps me find my own way to learn when studying. Overall, the students' response with the psychology of music aesthetics applied by their school in terms of movement corresponds to a weighted mean of 2.98 and a verbal interpretation of "Agree".
For initiation and maintenance of physical activity factor, rank one having the highest weighted mean of 3.14 and a verbal interpretation of "Agree"; I can escape from my tiring daily routines. Followed by I feel the energy I need for the day on rank two with a weighted mean of 3.10 and an interpretation of "Agree". Then on rank three with 3.02 and interpreted as "Agree", I can forget the problems in the environment that surrounds me. Lastly, having the lowest weighted mean of 2.99 and interpreted as "Agree", I can express my thoughts that I cannot share in words and I can put fantastic images or stories in my head. Overall, the students' response with the psychology of music aesthetics applied by their school in terms of initiation and maintenance of physical activity corresponds to a weighted mean of 3.05 and a verbal interpretation of "Agree".

5.2 Students Application of Contemporary Music Composition

The rating of the students to the contemporary music composition revealed that, staring on rank one, with a weighted mean of 2.03 which has the lowest mean the *sound of contemporary music is a bop* and interpreted as "Disagree". Followed by *contemporary music's genre is one of my choices and contemporary music has a nice flow of rhythm* both on rank three, with a weighted mean of 2.13 and a verbal interpretation of "Disagree". On rank four, *I often listen to contemporary music* with a mean score of 2.16 and interpreted as "Disagree". *Contemporary music has a good range of type of songs* was in rank five with a mean score of 2.32 and a verbal interpretation of "Disagree". On rank seven, with a mean score of 2.40 and a verbal interpretation of "Disagree" was *variety of music in contemporary music matches my various moods and listening to contemporary music makes me dance*. *Contemporary music has a good musical arrangement* has a weighted mean of 2.49 and interpreted as "Disagree" was on rank eight. *Songs composed as contemporary music are well known* was on rank nine having a weighted mean of 2.72 and a verbal interpretation of "Agree". Followed by rank ten was *today's music is comforting me whenever I can feel stress* with a mean score of 2.76 and interpreted as "Agree". On rank eleven *music nowadays eases my mind whenever listening to it* has a weighted mean of 2.77 and a verbal interpretation of "Agree". *Contemporary music helps me fall asleep* with a mean score of 2.85 was on rank twelve and has a verbal interpretation of "Agree". On rank thirteen with a weighted mean of 2.92 was *contemporary music are likely to be performed by people live* and a verbal interpretation of "Agree". *Contemporary music satisfies my likes when it comes to music* was on rank fourteen with a mean score of 3.14 and a verbal interpretation of "Agree". Lastly, *my everyday "go to music" are songs from contemporary music* was interpreted as "Agree" on rank fifteen with a weighted mean of 3.19. Overall, of the ratings of the students to the comptemporary music composition applied by their music teachers has a general weighted mean of 2.56 and has a verbal interpretation of "Agree".

5.3 The Effect of Psychology Of Music Aesthetics To Students Application of Contemporary Music Composition

The analysis of variance result revealed that since the computed F of 93.28 is greater that the critical value of 5.14 with the degree of freedom of 2 and 6 and level of significance of 5% thus the null hypothesis was rejected. Therefore, there is a significant effect of students understanding in the psychology of music aesthetics to their contemporary music composition.

5.4 Music Teachers Intervention Program Proposal

Based on the results of the findings, there is a need to propose an intervention program for teachers in music. Program Administrators in coordination with the teachers should consider the following components for the music intervention program for teachers to be applied to the students of music. The components of the intervention should be consisting of music in-depth recognition and understanding, complete world of music contemporary and future, and song analysis and appreciation as part of the activities in the music program.

6. Conclusions

Based on the significant findings, the following conclusions were reached:

1. Majority of the respondents disagreed that the psychology of music aesthetics applied by their school leads their thoughts to somewhere else neither helps them think about themselves, and even making them believe they are better able to cope with their worries.

2. Many respondents disagreed that the sound of contemporary music is a bop, and contemporary music's genre is not one of their choices. Most respondents disagreed that they often listen to contemporary music, and shared that contemporary music does not have a good range of type of songs. More respondents disagreed that variety of music in contemporary music matches their various moods and listening to contemporary music makes them dance. Lastly, contemporary music does not have a good musical arrangement according to the respondents.
3. The null hypothesis was rejected because the psychology of music has a significant effect to the students application of contemporary music composition.
4. There is a need to propose an intervention program for teachers of music program that will be beneficial for students, teachers and school administrators.

6.1 Recommendations

Based on the conclusions of the study, the following are hereby recommended:

1. Program Administrators together with the teachers should create activities for the students to recognize and appreciate further the psychology of music aesthetics. The set of activities focus on exploring voice timbres in popular music, use a lesson plan in recognizing different voice timbres, and find its examples. Listen to a song of choice and ask your students to describe the vocal qualities. Compare these songs to the opera excerpts they heard before. These components will extend their understanding to music through mood, movement etc.

2. The world of music should also be added in the intervention program encouraging teachers to improve activities such as playing an easy song with students in class. The teacher should divide the class to play different percussion parts, ukulele, piano and other instruments. Latin, Jazz, Pop and other genres available. The teachers should require the students to listen to a popular song by muting all instruments except one (percussions, piano, etc.), this will determine if the students can recognize the song.

3. Teachers should do song analysis with activities which are; before the class, select a song that is a good fit for the students. The teacher should choose something seasonal, or a song by one of the students' favorite artists. Ask the students to write some headings on the board for the different areas for analysis. This could include lyrics, structure, instrumentation, melody, and so on. The areas that the teachers will depend on the level of the students

4. The schools administrators and music teachers should continuously enhance the contemporary music composition skills in the school. The teachers should carefully review the various teaching approaches to the students considering the flow of music, bass, tempo, beats, soundtracks, guitars and other factors to be considered in learning music.

5. The teachers should be innovative and creative in teaching different music genres with the purpose of catching the learners interest. Different variety of music, and range in type of songs should thoroughly be explained by the teachers considering that it will not only be a requirement for the students but ensure that it will match their mood so that they can also dance.

Funding: This research received no external funding.
Conflicts of Interest: The authors declare no conflict of interest.
Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers.

References

[1] Anderson, J. C. (2000). Aesthetic concepts of art. In N. Carroll (Ed.), Theories of art today (pp. 65–92). University of Wisconsin Press. https:// uwpress.wisc.edu/books/3055.htm
[2] Armstrong, T., & Detweiler-Bedell, B. (2008). Beauty as an emotion: The exhilarating prospect of mastering a challenging world. *Review of General Psychology, 12*(4), 305–329. doi:.10.1037/a0012558
[3] Belke, B., Leder, H., & Carbon, C. C. (2015). When challenging art gets liked: Evidences for a dual preference formation process for fluent and non-fluent portraits. *PLOS ONE, 10*(8), Article e0131796. doi:.10.1371/journal.pone.0131796
[4] Blood, A. J., & Zatorre, R. J. (2001). Intensely pleasurable responses to music correlate with activity in brain regions implicated in reward and emotion. *Proceedings of the National Academy of Sciences of the United States of America, 98*(20), 11818–11823. https://doi.org/10.1073/pnas .191355898
[5] Bullot, N. J., & Reber, R. (2013b). A psycho-historical research program for the integrative science of art. *Behavioral and Brain Sciences, 36*(2), 163– 180. https://doi.org/10.1017/S0140525X12002464
[6] Cheung, V. K. M., Harrison, P. M. C., Meyer, L., Pearce, M. T., Haynes, J.-D., & Koelsch, S. (2019). Uncertainty and surprise jointly predict musical pleasure and amygdala, hippocampus, and auditory cortex activity. *Current Biology, 29*(23), 4084–4092.e4. https://doi.org/10.1016/j.cub .2019.09.067

[7] Fechner, G. T. (1876). Vorschule der aesthetik [Elements of aesthetics]. Druck und Verlag von Breitkopf & Härtel.
[8] Hanslick, E. (2018). On the musically beautiful: A new translation (L. Rothfarb & C. Landerer, Trans.). Oxford University Press.
[9] Juslin, P. N., & Västfjäll, D. (2008). Emotional responses to music: The need to consider underlying mechanisms. *Behavioral and Brain Sciences, 31*(5), 559–575. https://doi.org/10.1017/S0140525X08005293
[10] Koelsch, S., Jacobs, A. M., Menninghaus, W., Liebal, K., Klann-Delius, G., von Scheve, C., & Gebauer, G. (2015). The quartet theory of human emotions: An integrative and neurofunctional model. *Physics of Life Reviews, 13*, 1–27. https://doi.org/10.1016/j.plrev.2015.03.001
[11] Leder, H., Belke, B., Oeberst, A., & Augustin, D. (2004). A model of aesthetic appreciation and aesthetic judgments. *British Journal of Psychology, 95*(4), 489–508. https://doi.org/10.1348/00071260423 69811
[12] Matthen, M. (2017). The pleasure of art. *Australasian Philosophical Review, 1*(1), 6–28. https://doi.org/10.1080/24740500.2017.1287034
[13] Menninghaus, W., Wagner, V., Hanich, J., Wassiliwizky, E., Jacobsen, T., & Koelsch, S. (2017). The Distancing-Embracing model of the enjoyment of negative emotions in art reception. *Behavioral and Brain Sciences, 40*, Article e347. https://doi.org/10.1017/S0140525X17000309
[14] Sherman, A., & Morrissey, C. (2017). What is art good for? The socioepistemic value of art. Frontiers in Human Neuroscience, 11, Article 411. https://doi.org/10.3389/fnhum.2017.00411
[15] Skov, M., & Nadal, M. (2020). A farewell to art: Aesthetics as a topic in psychology and neuroscience. *Perspectives on Psychological Science, 15*(3), 630–642. https://doi.org/10.1177/1745691619897963
[16] Song, L. (2022). RESEARCH ON THE INFLUENCE OF COLLEGE MUSIC APPRECIATION PEDAGOGY ON STUDENTS'AESTHETIC PSYCHOLOGY AND CONSCIOUSNESS. *Psychiatria Danubina*, *34*(suppl 4), 470-470. https://hrcak.srce.hr/file/409592
[17] Thompson, W. F., Bullot, N. J., & Margulis, E. H. (2022). The psychological basis of music appreciation: Structure, self, source. doi:.10.1037/rev0000364
[18] Tiihonen, M., Brattico, E., Maksimainen, J., Wikgren, J., & Saarikallio, S. (2017). Constituents of music and visual-art related pleasure—A critical integrative literature review. *Frontiers in Psychology, 8, Article 1218.* https://doi.org/10.3389/fpsyg.2017.01218
[19] Xu, F., & Xia, Y. (2022). ANALYSIS ON THE TEACHING PRACTICE OF MUSIC AESTHETIC APPRECIATION IN COLLEGES AND UNIVERSITIES FROM THE PERSPECTIVE OF MUSIC EXPERIENCE. *Psychiatria Danubina*, *34*(suppl 5), 439-439. https://hrcak.srce.hr/file/410279
[20] Yu, L. (2021). Research on the construction of music appreciation ecological classroom and the innovation of teaching methods. In *E3S Web of Conferences* (02034). EDP Sciences. doi:./10.1051/e3sconf/202123502034