

A COMPARATIVE STUDY ON MUSICIANS AND
NON-**MUSICIANS' AFFECTIVE RESPONSE IN**
MUSIC LISTENING

LOH WAI NENG

CULTURAL CENTRE
UNIVERSITY OF MALAYA
KUALA LUMPUR

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NON-MUSICIANS' AFFECTIVE RESPONSE IN
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LOH WAI NENG

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Name of Candidate: LOH WAI NENG

Matric No: ROA180001

Name of Degree: MASTER OF PERFORMING ARTS (MUSIC)

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A COMPARATIVE STUDY ON MUSICIANS AND NON-MUSICIANS'

AFFECTIVE RESPONSE IN MUSIC LISTENING

ABSTRACT

This study examined the affective responses in the music listening among undergraduates' student using Circumplex Model of Emotion (Russell, 1980). The purpose of this study was to investigate the affective responses of undergraduate music major and non-music major students in music listening to four different music genres, which were classical music, romantic music, atonal music and experimental music. A study involving of 123 participants from undergraduate music major and non-music major students in Klang Valley area was conducted using google form. By using SPSS to tabulate the data, the result showed that there were no major differences between both musicians and non-musicians when they listen to four different types of music genres. For classical music and romantic music, emotion responses for both musicians and non-musicians are towards to high valence, whereas for atonal music and experimental music, the emotion responses for both musicians and non-musicians are towards to low valence.

Keywords: affective response, musician, non-musician, music listening

SATU PERBANDINGAN ANTARA PEMUZIK AND BUKAN PEMUZIK
PADA AFEKTIF RESPONS DALAM PENDEGARAN MUZIK

ABSTRAK

Kerja ini mengkaji afektif respons dalam pendegaran muzik antara pelajar sarjana muda dengan menggunakan 'Circumplex Model of Emotion' (Russell, 1980). Tujuan kerja ini adalah untuk menyelidik afektif respons antara sarjana muda pemuzik dan bukan pemuzik semasa mendengar empat genre muzik yang berlainan, iaitu muzik klasikal, muzik romantis, muzik atonal, dan muzik experimental. Kerja ini membabitkan 123 orang responden dari sarjana muda pemuzik dan bukan pemuzik dalam kawasan Klang Valley dengan menggunakan google form. Dengan penggunaan SPSS bagi menjadualkan data, keputusan menyatakan tidak mempunyai perbezaan yang besar antara sarjana muda pemuzik dan bukan pemuzik semasa mereka mendengar empat genre muzik yang berlainan. Bagi muzik klasikal dan muzik romantis, emosi respons bagi pemuzik dan bukan pemuzik adalah ke arah valence tinggi, manakala bagi muzik atonal dan muzik experimental, emosi respons bagi pemuzik dan bukan pemuzik adalah ke arah valence rendah.

Kata kunci: afektif respons, pemuzik, bukan pemuzik, pendegaran muzik

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Music listening exists in people's everyday lives. It is known as the most popular leisure activities (Schäfer, Sedlmeier, Städtler, & Huron, 2013). In Dolegui's (2013) study, he found out that many students listen to music for releasing stress and anxiety when it comes to complex cognitive processing, for instance completing an assignment, studying for a test and many more. It proves that music listening could improve their cognitive performance, but there are also some contradict result, where some of the participants found that listening to music is a distraction for them.

Music listening can arouse strong emotional responses. According to Juslin and Västfjäll (2008), when a person listening to music, it will form a special music experience on an individual whereby it will influence an individual's feeling, body, and even brain development. Scherer and Zentner (2001) defined emotion in the psychological perspective indicted that it is a "diffuse affect states" which is subjective to feeling changing with low intensity that persist across "encounters with multiple stimulus events" (p. 383).

In Radocy and Boyle (2003) study, emotion defined as one of a part of feeling that is in psychological field that related to affective aspect. Emotion combined with both body and mind states that includes emotional response that produced by an individual and physical change that cause by stimulation. It is important issue in music psychology even though emotional responses belong to the basic level of music behaviours. Further, according to Ruud (2002), emotion involves mind movement; therefore, it conveys important information regarding the person's state.

According to Schafer et al. (2013), there are three benefits in term of psychological factors of music listening, first, music listening can regulate one's arousal and mood. Second, it can also achieve self-awareness and lastly, music listening acts as an expression of social relatedness. In Russell's (1980) study, he stated that two broad dimensions of valence (pleasantness) and arousal (activation) have been identified using the multidimensional scaling (MDS) techniques, and it known as Circumplex model of emotion.

In an earlier study by Hevner (1936) study, it was suggested that instead of focusing the emotion of the listener, she focused on the emotion that the music was portraying. Hevner used a quadrant which involves valence dimension and arousal dimension to insert a contrasting emotion identified for each of the music selections. This approach was similar to Russell's Circumplex Model of Emotion after around 45 years, which is in the year of 1980 (Russell, 1980). Nonetheless, Russell's circumplex does not make a reference to Hevner's study.

With the presence of stressors, music listening could lower down an individual's arousal level to an optimal level. For instance, individual who listens to music that are relaxing tends to show a faster recovery rate as compared to individual who listens more to nature sounds (Thoma et al., 2013). In contemporary society, there are much agreement to support that individuals feel and perceive emotions when they listen to music. However, in Mas-Herrero, Zatorre, Rodriguez-Fornells, and Marco-Pallarés's (2014) study, there are some individuals reported that they do not feel any pleasure or feeling any enjoyment when they listen to music. According to Juslin and Västfjäll (2008), it was indicated that listeners generally tend to experience more positive emotions than negative emotions when listens to music; and listeners prefer to listen to music that gives them positive emotions, for instance music that promotes happiness than to listen to music that arouses dark mood.

According to Fischer (2013), although there were numerous studies has been done to identify different emotion towards different structural elements of music, however there has not been much study into different people have different emotional responses towards music.

1.2 Statement of the Problem

There are differences in music listening experiences between musicians and non-musicians. According to Kreutz, Ott, Teichmann, Osawa, and Vaitl (2007), they stated that people with musical training, which generally known as musicians, are considered as the ones that might be affected with vivid emotional responses when listening to music. In general perspectives and assumption, musicians are better at cognitive learning. Whereas in the study of Kreutz et al. (2007) study, the researchers stressed out that non-musician showed a stronger emotion response as compared to the musician. Further, it also contrasted with the findings of Hamamoto, Botelho, and Munger (2010) research which stated that non-musicians are sensitive to the tonal music as compared to musicians.

According to Daynes (2010), she presented that there are differences between musician and non-musician in their emotional responses when they listen to atonal and tonal music whereby musician shown more emotional intensity as compared to non-musician. However, in general, participants had a much lower emotional response to atonal music than to tonal music, this music genre is perceived as negative among the average listeners. The emotional responses to atonal music are not explored broadly by music psychologists, as majority of them used Classical and Romantic music to measure emotional response. From the discussion above, the study aims to investigate the differences in music listening emotive responses among musicians and non-musicians.

1.3 Research Objectives

This study focuses on the affective responses in the music listening among undergraduate music major and undergraduate non-music major students using Circumplex Model of Emotion. The purpose of the research aims to investigate the affective responses of undergraduate music major and undergraduate non-music major students in music listening to four different music genres: (1) Classical music; (2) Romantic music; (3) Atonal music; and (4) Experimental music.

1.4 Research Questions

There are three research questions to be investigated in this study, which are:

1. What are the affective responses of undergraduate music major students listening to classical, romantic, atonal and experimental music?
2. What are the affective responses of undergraduate non-music major students listening to classical, romantic, atonal and experimental music?
3. What are the differences in the ranges of affective responses between undergraduate music major and non-music major students listening to classical, romantic, atonal and experimental music?

1.5 Significance of the Study

This study contributes to the understanding of the value of music listening for music major undergraduates' student and non-music major undergraduates' student to pick the right song to listen that gives them emotional benefits whether it is in positive or negative emotion responses. Besides, this study aims to contribute further knowledge to music psychologist researchers in increasing the findings of how listening to different types of music affects different types of affective responses.

1.6 Delimitation of Study

There are three components of delimitations to the study. First, the participants are delimited to undergraduates' students. These participants have diverse musical background, and from a range of majors; nevertheless, with their academic status as 'undergraduate', they are included as the representative of the general population at large. Besides, the choices of music listening material used are delimited to tonal and atonal music. Tonal music is again delimited to classical music and romantic music that are homophonic texture, thus polyphonic texture music in Baroque, Renaissance or Rococo period is not included. Whereas for atonal music are delimited to atonal music and experimental music. Furthermore, the entire repertoire chosen were piano pieces. Thirdly, this study was geographically delimited to the Klang Valley area, where the selected undergraduate participants were chosen randomly from local and private universities.

1.7 Definition of Terms

The following presents the theoretical and operational definition of terms for this study.

1.7.1 Music listening

In the study on Schäfer, Sedlmeier, Städtler, and Huron (2013), music listening defined as "enigmatic" (p. 1), a mysterious aspect of human behaviours. In this study, music listening is defined operationally in the study as listening to recorded music of four different genres, in a home-based environment.

1.7.2 Valence

According to Gomes, Brainerd and Stein (2013), they defined valence defined as the level of pleasantness that is provoked when a stimulus is encoded, which the pleasantness ranges from strongly negative; then to neutral; and to strongly positive. Valence means

that how an individual judge a stimulus, whether it is unpleasant or pleasant (Fairfield, Ambrosini, Mammarella, & Montefinese, 2017).

1.7.3 Arousal

According to Gomes, Brainerd, and Stein (2013), they defined arousal as the level of activation that is provoked when a stimulus is encoded, which the activation ranges from calm emotion to excited emotion. Arousal means that the activation degree of an individual feels towards a stimulus, whether it is calm (low) or exciting (high) (Fairfield, Ambrosini, Mammarella, & Montefinese, 2017).

1.7.4 Tonal music

According to Milne (2010), he defined tonal music as the music that uses the chords to establish the tonic chord. Tonal music is a form of art music from 17th to the early of 20th century. In this study, tonal music refers to music from the Classical and Romantic genres.

1.7.5 Atonal music

Mencke, Omigie, Wald-Fuhrmann, and Brattico (2019) defined atonal music as 20th or 21st century art music that characterised as lacking of tonal scale, regular meter and tonal centre. In Hindley's (1971) study, he defined atonal as "the abandonment of key as a system of organisation" (p.546). However, in this study, atonal music defined as music that without tonal centres, and all the notes that played are used impartially (Kennedy, 2007). Additionally, Daynes (2010) stated that melody, harmony, rhythm and other elements in a music are release in atonal music that makes the music lack of tonality. Furthermore, the focus of atonal music is not on the melody nor harmony, rather include different elements such as texture and timbre.

1.7.6 Experimental music

According to Rockwell (1986), experimental music is defined as a variety set of music “that gained momentum” (p. 51), arose in the mid-20th century. This type of compositional music and performance are very unpredictable. In this study, experimental music refers to music that focuses more on its compositional elements.

1.8 Conclusion

Chapter 1 has presented the statement of problem, research objectives, research questions, the significance of study, and delimitation of the study. The chapter concluded with the theoretical and operational definition of terms. This study aims to focus on listening to four different types of music genre, which are classical music, romantic music, atonal music and experimental music using Circumplex Model of Emotion.

CHAPTER 2

LITERATURE REVIEW

2.1 Music Listening

Music listening is one of the famous and the most easily accessible activity in human's everyday daily life. In Rentfrow and Gosling (2003) study, they reported that the participants listen to music more frequent than any other activity such as watching movies, reading books, and eating, and suggested that music acts as a fundamental role in an individual's everyday lives. According to Saarikallio (2012), the researcher found that there were about 100% of people love music. Additionally, there were 64% of peoples have the habit of music listening multiple times per day and 18% of peoples listen to music once per day (Greasley & Lamont, 2011). Music can be appeared as different functions, for instance it can be a leisure activity where the individuals can listen to music on a radio when driving car, music played as background on a shopping mall, and listen a music performance on a concert hall. Yet, music has a big ability to reflect one's emotion (Saarikallio, 2008).

Individuals can easily access to listen to different types of music with the advanced technology in today's world (Greasley & Lamont, 2006). Music listening are not only restricted to live performance, radio broadcasts, or recordings, as an alternative it can be accessed through digital ways, for instance from smart phones, tablets, laptops, even television with online services that can stream millions of different choices of music (Krause, North, & Hewitt, 2013).

Also, based on Skanland (2011), individuals can listen to their preference songs whenever and wherever they want by using their portable MP3 players, and they can listen to the songs repeatedly. And through listening to music, the sound that produced can trigger individual's emotion response.

One great reason that why individuals really get into themselves seems to be their emotional get evoked by listening to music (Thoma, Ryf, Ehlert, & Nater, 2006). According to Wheeler (1985), there is an interconnection between emotion and music before listening and after listening to it. For instance, people who was in cheerful emotion before listening to music and did not prefer to the music that listened reported decrease significantly in happiness, whereas for people who was in sorrowful emotion before listening to music and prefer to the music that listened reported less sorrowful after listening.

2.2 Emotion Responses

According to Dalsborn (2015), music used to regulate as well as develop physical and physiological responses and emotions on a human. Music is regarded as the "language of emotions" as it is designed to induce the emotions through sensory and or cognitive processes (Juslin & Västfjäll, 2008).

In Swaminathan and Schellenberg's (2015) work, they accumulated few works from past research and reported that individuals across diversity of age groups use music to control their feeling and mood; to improve their motivation; to relax and distract from stress. Also, there are some individual's report that they don't feel any pleasure or feeling a little when listens to music (Mas-Herrero, Zatorre, Rodriguez-Fornells, & Marco-Pallarés, 2014).

In Theorell and Bojner Horwitz (2019) study, they pointed out that if listener has a strong feeling towards a specific song, his or her emotion may amplify if compared to other listener that was no feeling towards the song. For instance, some listeners may respond a happy feeling towards a song that other listeners may be feeling the sadness or react with a very strong tension towards a song that most other listeners may find it very clam.

There are differences of emotion response in listener's age. For instance, in Vieillard and Gilet's (2013) finding, older individuals are reported to have greater emotions than younger individuals when they listen to happy sounding music, and older individuals showed a higher of zygomatic EMG activity when they listen to scary sounding music.

Another finding by Larsen and Whitaker (2013), they pointed out that repeated hearing a song may found out that there are different emotion responses, for some listeners. This is because the attention level as well as the listener's mind-set was different, they tend to figure out more what is missing and hadn't noticed in the first listening.

One interesting finding from Liljeström, Juslin, and Västfjäll (2013) which indicated that listening to music accompanied with a close friend comparing listening to music alone is reported to give rise to positive emotional responses. The finding suggested that it has higher mean ratings of happiness-elation emotion; enjoyment-pleasure emotion and admiration-awe emotion. Moreover, participants self-selected music tends to have greater emotional experiences than unfamiliar music. Self-chosen music will make an individual to have more familiarity towards the music than music that is randomly chosen, as familiarity towards a song will enable a huge number of underlying mechanisms to activate emotion induction, and thus produce more positive emotion.

In Russell's (1980) study, emotional responses are frequently being measured along two continuous dimensions, one vertical dimension that assessing arousal level which is from low activation to high activation; whereas for horizontal dimension that assessing valence level which is from negative pleasantness to positive pleasantness. As positive and negative emotions lie at opposite ends of the bipolar valence continuum, therefore they cannot occur at the same time. Both separates arousal and valence dimensions combined to form a circumplex model, which concludes all the emotions that represented.

In Huang and Wu's (2019) study, they classified emotion into three different levels of mean scores, and categorised emotion into five categories, which were happy-sad emotion; agitated-calm emotion; humorous-serious emotion; longing-depressed emotion; and majestic-delicate emotion. For instance, in happy-sad category, mean score that is higher indicates that it is a happy emotion; lower mean score indicates that it is a sad emotion. There were total of 12 excerpts being conducted in this study, and 179 undergraduate students participated. To sum up, happy-sad and agitated-calm were the most common emotion that tested by the participants. However, the excerpts that chosen in this study were not classified into more details.

Further, music psychologists also indicated that emotional responses towards atonal music are not investigated in-depth sufficiently as compared to music from classical and romantic period (Daynes, 2010).

2.2.1 Emotion responses between musician and non-musician

According to Kreutz, Ott, Teichmann, Osawa, and Vaitl (2007), they drawn attention to the emotional responses in music listening among the musicians, whom are generally assumed to be more sensitively affected by music. In a general perspectives and assumption, musicians are better at cognitive learning, and therefore, they acquire stronger and keen responses when listening to classical music. That is also a supposition that musicians with classical background since young have a more reflective and intense responses towards classical music as compared to popular music (Sopchack, 1955). Also, in Kreutz et al. (2007), the researchers stressed out that non-musician showed a stronger emotion response in general, than musician, except for peacefulness. It might be musician tend to listen more on the technical aspects of the performance rather than to feel the music. However, participants would have to listen to 25 music excerpts representing five

emotion categories, which were 'happy', 'sadness', 'fear', 'anger' and 'peace', this experiment took a longer period to finish.

Bumgarner (2015) tested emotion response on dissonance music between musician and non-musician. According to Foss, Altschuler, and James (2007), Pythagoras has proposed the rules regarding consonance and dissonance. He said that the combination of two tones with a simple ratio, for instance an octave or fifth apart, were pleasing to the ear, so he named it consonant. Whereas the dissonance is the combination of two tones with complicated ratio, for instance major or minor second, tritone, major or minor seventh, that was harsh to ears. In Pythagorean rule, it has become a basic for Western classical music, music progresses with consonant intervals, and resolves the dissonant intervals.

As what Bumgarner (2015) expected, dissonance music gained a negative rating compared to consonant music, for both musician and non-musician. But for musician, even though they gave a negative rating on listening to dissonance music, but the result was not so significant. Musician already know the structure and knowledge about consonant music, therefore they will be aware more on dissonance music, because they want to learn more about dissonance music (Schon, Regnault, Ystad, & Besson, 2005). However, in this study, one of the limitations is that the researcher acquires the same excerpts that used by past studies, which he repeated the studies done by past researcher.

Kelly and Tan (2004) did a study on musician and non-musician undergraduates to create graphic representation of a complete compositions song while they are listening to and write some explanation after that. Results showed that musicians were more focus on the cognitive dimensions such as the themes, instruments identification, changes of modes, pitch, repetition, whereas non-musicians were more focussed on the affective

dimensions describing the emotion whereby they link the music with some images and make up a storyline that suits the music.

According to Daynes (2010), she presented that there are differences between musician and non-musician in their emotion responses when they listen to atonal and tonal music. The findings suggested that musicians have more emotional intensity than non-musicians. However, she did not conclude which aspects of musical training that musicians have to musical knowledge and listening familiarities to experience this effect. In her study, she used mixed-method research design and three musical excerpts were given to 19 participants to listen; and they were assigned to a two-week of time period to listen to the music in order to familiarize themselves with the compositions. During this two-week time frame, all the participants in this experiment were required to self-report their emotional responses to the music in both qualitative and quantitative forms. The researcher found that musicians were better in identifying musical structures than non-musicians, but she also stated that in overall, participants had a much lower emotional responses when they listened to atonal music compared to tonal music. However, this study used a relatively small number of participants; therefore, it is most likely to provide a conservative result. It is also very important to note that the excerpts being used in this study only consisted of one type of musical instrument, the piano.

For Hamamoto, Botelho, and Munger (2010), they found that non-musicians are sensitive to the tonal music; at the same time, their informal musical knowledge also enables them to identify the bitonal music, as well as trained musicians. It is not surprising to know that non-musicians were sensitive to bitonal music, it is due to bitonal music is not a usual composition style that we used to hear, and the music was used by a very little number of composers.

Ransdell and Gilroy (2001) conducted a study with 45 undergraduate psychology students, on how listen to classical background music has an effect on the performance

of multi-tasking while doing their school work. The participants in this study were required to participate in both conditions, which are silent and with background music. The background music consisted of three slow ballads; all the songs taken from a sing-along with a Nelson Riddle Orchestra tape. In addition, it also consisted of one instrumental and two vocal songs. The results had shown that the presence of background music would slow down the word processing among the participants. It is reported that the participants could not really concentrate in writing while listening to background music; in contrast, they were able to concentrate better in the silence condition. They also found that participants who had prior musical training write and construct better and longer sentences than those who had no musical training before.

Tempo does produce different emotions. As according to Liu et al. (2018), music with fast tempo produces the most pleasant emotion, whereas music with slow tempo evoked lower arousal emotion. Also, in their study, they found out that musicians and non-musicians have different emotions when they listen to the music with different tempo. As they stated, musicians were more refined in their music recognition, such as they are more ability to listen to rhythm and the beats of the piece, and thus they perceived stronger activation than non-musicians. When the researchers tested the valence dimension of emotional responses between musicians and non-musicians when they listen to music that is in fast tempo, there were significant differences. However, musicians showed a higher valence emotional than non-musicians when they listen to music in fast tempo when the comparison was separated in the valence and arousal dimensions. Participant's ratings showed a decreasing tendency from musicians to non-musicians in the valence dimension; whereas in the arousal dimension, participant's ratings showed an increasing tendency from musicians to non-musicians, it showed that there are differences between musicians and non-musicians that played different role in affecting their emotion responses.

In more scientific studies, according to Mikutta, Maissen, Altorfer, Strik, and Koenig (2014), it was reported that professional musicians show a larger brain responses than non-professionals when their brain activities are being measured using electroencephalography (EEG) while both parties listen to Beethoven's 5th Symphony first movement, which also implies that professional musicians may experience musically induced emotions intensely.

Listening to different music types does induce different kinds of emotion. According to Krumhansl (1997), listening to music that is sad-sounding leads to decreases in heart rate level as well as skin-conductance level, however it increases blood pressure level. It was indicated that listening to music that is frightening would increase in pulse transmission time and on the other hand decreases in pulse amplitude. Further, listening to music that is happy-sounding would have decrease in depth of respiration.

In sum, these studies indicated that there are different ways of listening among musicians and non-musicians where the musicians tend to listen to the music more in-depth and focus on cognitive dimensions based on their formal musical knowledge whereas the way of non-musician listening to music generally dependent on their informal musical knowledge and impression of the affective dimensions.

2.2.2 Emotion responses to tonal and atonal music

Emotional responses towards atonal music are not investigated massively by music psychologists as the majority of the music used by the researchers was the repertoire from Classical and Romantic period. In one of the most recent studies by Kallinen (2005), he discovered that a higher frequency of tonal music was selected as compared to atonal music when the participants were asked to choose musical works that expressed emotions. The reasoning provided by Kallinen was, firstly, the atonal music projected the emotions in different manner as compared to tonal music. Secondly, tonal music has more

familiarity and is common to be performed and heard in the surrounding environments as compared to the listening of atonal music, generally in lesser normal expectations.

In Scruton's (1997) study, he suggested that atonal music may portray negative emotions as he thinks that atonal music is lack of a significant element that tonal music has, which is "most music that seems meaningful to us is tonal" (p.233). According to Daynes (2010), she found that participants had a much lower emotional response to atonal pieces compared to tonal pieces. Three excerpts that used in this study was Clementi's Piano Sonata, Op. 25 (tonal piece), and Schoenberg's Op. 11 and Berio's Rounds (atonal pieces). This study also stated that Clementi's Piano Sonata produced more intense emotional responses than Schoenberg or Berio's pieces.

Tonal music makes the music understandable to be perceived as positive in terms of emotional and cognitive experiences. The music created pleasure in the same degree, as tonal music creates structure by the tonality on the music itself. People would know that the music is tonal even they did not select the music pieces, as tonal music is quite predictable compared to atonal music. For tonal music that is relaxing, it could be used for emotional regulation as the music induces low and moderate activation (Dalsborn, 2015).

In De Yarman's (1972) finding, he stated that young children who are exposed to both tonal and atonal music perform tonal music better than children who exposed to tonal music only. The reasons that he speculated stated that atonal melodies and unusual meters are not taught in school by the music teachers, as music teachers find it difficult to perform atonal music.

In Theorell and Bojner Horwitz's (2019) study, they tested the emotion effect according to the respondent's age when they listen to classical (tonal) music. Most of the adult listeners that are familiar with the classical (tonal) music shown the increased of

arousal levels as compared to the younger listeners that has no previous experience in listening to classical (tonal) music, in which their arousal levels decreased significantly.

Based on what Huang and Wu (2019) stated, they found that classical (tonal) music listening causes a happy and majestic emotion response compared to non-classical (atonal) music listening. It has been suggested that future study to investigate on these kinds of music to observe how different music elements and music styles can generate diverse result. And, to measure the respondent's emotion prior to any experiment as specified by Wheeler (1985), that emotion before listening to any specific music does make an important effect. In another finding as well, by Trost, Ethofer, Zentner and Vuilleumier (2011) provided evidence in the increase of respiration rates when a person is listening to music that played by classical musical instrument and it was recognised as high arousal level and positive valence.

2.3 Circumplex Model

Russell (1980) proposed the Circumplex Model based on Hevner's (1936) work. According to Wenas, Sjahputri, Takwin, Primaldhi, and Muhamad (2016), circumplex model of affect is a model with two dimensions, arousal as the vertical axis, that measures emotional intensity. Whereas valence as horizontal axis, that measures the emotion ranging from negative to positive. For instance, 'anger' emotion is a negative valence emotion with high arousal level; 'boring' emotion is a negative valence emotion with low arousal level. On the other end of the spectrum in the model, 'amused' emotion is a positive valence emotion with high arousal level; and 'relaxed' is a positive valence emotion with low arousal level.

In the same study, they have built a mass quantity of vocabulary that consists of 3,000 Indonesian words to find out the arousal and valence contents in Indonesian language. They followed Russell's circumplex that mainly focus on the emotional states'

measurement. The source of these vocabularies is the words that was most frequently being used in Twitter conversation from the year of 2010 to year 2012. 83 students were being measured and tested on how the words perceived by participants on arousal level and valence by using online platform. The result concluded with there was no significant correlation between arousal level and valence, as what they expected before they carry on this experiment.

A study by Ali (2004), he used circumplex theory of emotion to test the differences in affective responses to music that had lyrics or not, and the results were music without lyrics produced positive emotions, whereas music with lyrics enhanced negative emotions. One possible explanation that he made was participants relied on the melody for the music that delivered positive emotion, on the other hand relied on the lyrics for the music that delivered negative emotion.

In Darbyshire, Bell, and McDonald's (2006) study, they conducted an experiment to determine whether the circumplex model of emotion is relevant when it applied to a consumption experience. They did field experiment and there were total of 715 respondents included in this quantitative research to test about their emotion on reading a magazine. In this study, they used all the emotions that introduced by Russell and with this emotion model being supported, the result provides an insight into the structure of different type of emotional responses that produced by consumers.

According to Zhong, Qiao, and Zhang (2019), they aim to find out the effectiveness of WeChat emoticons in emotional communication by using Russell's Circumplex Model of Affect. There were 20 participants participated in this experiment and they were asked to score 99 emoticon samples based on two dimensions, pleasant degree and activation degree using the form that applied Likert 5-point scale. It was found that one-third of the emoticons have greater consistency in user perception of emotional communication. In addition, these emoticons that achieved higher user cognition

consistency have a very huge insufficiency in the completeness of emotional expression, based on the positioning of Russell's Circumplex Model of Affect.

2.4 Conceptual Framework of the Study

A *conceptual framework* is the synthesis of previous literature and prior knowledge on explaining a phenomenon of a specific field. It aims to map the procedures that guided the study. Based on the discussion on the literature review of previous studies and prior knowledge, a conceptual framework for this study was proposed to serve as a guide for this study to examine the affective responses of undergraduates' students in music listening to four different music genres. The conceptual framework underpinning this study is presented in Figure 2.1.

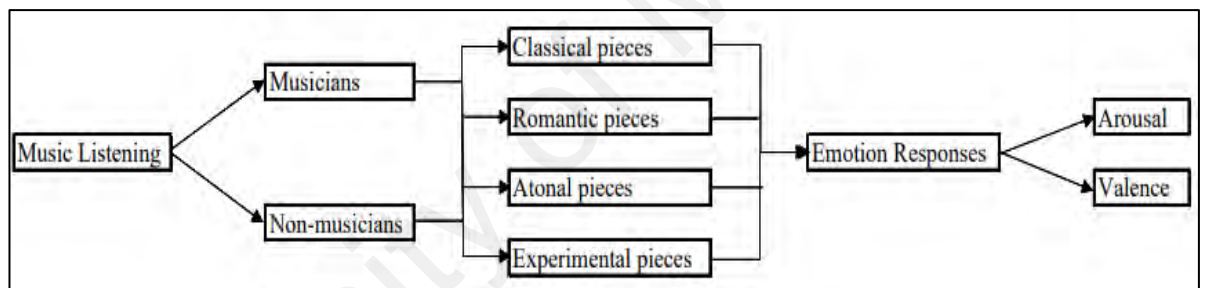


Figure 2.1. Conceptual Framework of the Study

CHAPTER 3

METHODOLOGY

3.1 Overview

This chapter provides a succinct description of the research methodology in this study. The sections of the chapter will be organised as follows: (1) research design; (2) participants; (3) data collection procedure; and (4) data analysis procedure. This study aims to address the following research questions:

1. What are the affective responses of undergraduate music major students listening to classical, romantic, atonal and experimental music?
2. What are the affective responses of undergraduate non-music major students listening to classical, romantic, atonal and experimental music?
3. What are the differences in the ranges of affective responses between undergraduate music major and non-music major students listening to classical, romantic, atonal and experimental music?

3.2 Research Design

A research method is a process or system used for collection of data for all research that is being conducted. The research method can be in any specific type, and data collection can take from many methods such as questionnaires, open ended or close-ended surveys, participant observation, structured interview schedule and many more (Bryman, 2012).

There are two main methods that one can use to collect data for a research study, which are the quantitative research methods and qualitative research methods. A quantitative research method is a research method that emphasizes on quantification analysis and collection of data, typically using a logical approach between the theory and the research, this type of research focuses on the quantity of things. Quantitative research

method mostly regarding testing of theories in a research and it usually tries to prove a given hypothesis (Bryman, 2012).

However, qualitative research method, stresses more on words compared to quantification analysis of the collected data. It often includes the internal worlds or their personal view of the participants, and it may include the data generated through interviews. Unlike the quantitative research strategy, the qualitative method will be more onto the relationship between the research and the theory by way of reasoning from the facts collected by the researcher (Bryman, 2012).

This study employed the quantitative research method. The advantages of quantitative method are with a larger sample sizes, it often makes the conclusions from the results and findings more generalizable.

3.2.1 Survey

According to Check and Scutt (2011), survey is defined as the cumulative information that gathered from an individual's sample through their responses towards the questions prepared by researcher. Survey can be used in quantitative research methods, for instance by using questionnaires that comes with numerically rated items. Further, it can be used in qualitative research methods as well, for instance using an open-ended question. The purpose of survey is to obtain a sufficient sample that represents the whole population of interest.

In the theoretical purview, the survey instrument for this study was framed on Russell's Circumplex Model of Emotion. This model was expanded by Russell (1980), and is structured with two axes: the valence, which is to test the pleasantness of the feeling, and the other; the arousal which determine a person's feeling is in high or low activation. The framework of this model (Figure 3.1) illustrated how the affective concepts of 28 emotions divided and fitted into each of the four quadrants.

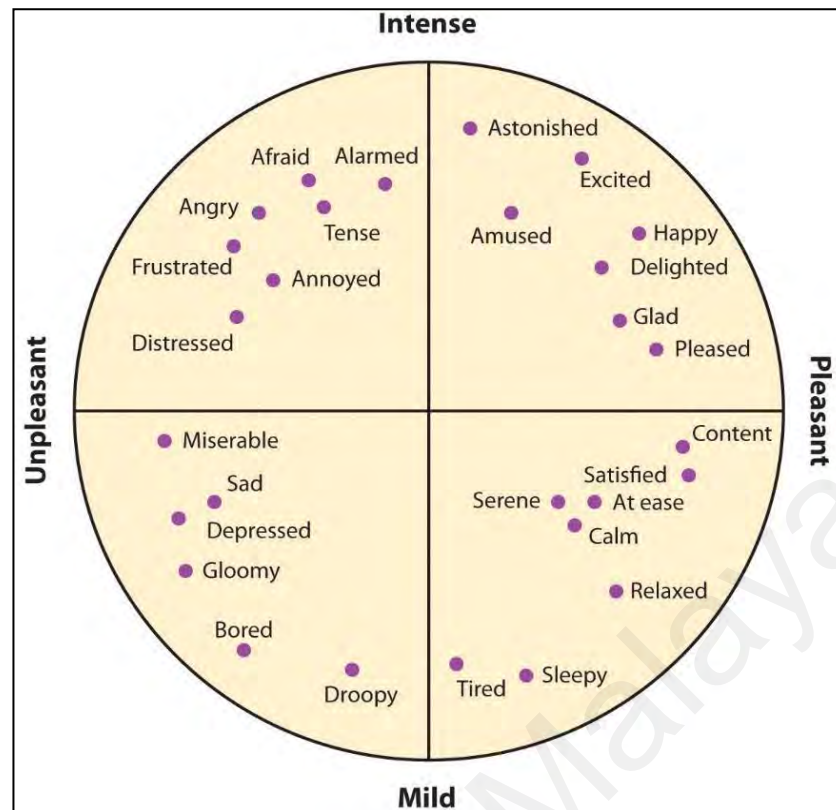


Figure 3.1 Circumplex Model of Emotion (Russell, 1980)

There are four categorizations in Circumplex Model of Emotion. Astonished, excited, amused, happy, delighted, glad, and pleased are categorised as high arousal and positive valence. Afraid, alarmed, angry, tense, frustrated, annoyed, and distressed are categorized as high arousal and negative valence. Miserable, sad, depressed, gloomy, bored, and droopy are categorized as low arousal and negative valence. Content, satisfied, serene, at ease, calm, relaxed, tired, and sleepy are categorized as low arousal and positive valence.

In this study, through the music listening of various musical excerpts from the four musical genres, all participants were required to respond to the researcher self-designed survey to rate their emotion based on the choices of emotion stipulated in Russell's Circumplex Model of Emotion.

3.2.2 Participants

123 participants (N=123) for the study were recruited which comprised of 62 undergraduate music major students and 61 undergraduate non-music major students. The study was delimited to the participants from public and private universities in Klang Valley area.

In this study, undergraduate music major students refer to music students that are currently pursuing their music degree in university and had a minimum requirement of ABRSM Grade 5 theory and Grade 5 practical. Whereas for undergraduate non-music major students, it refers to student that have no music background, unless the participant had a minimum requirement of ABRSM Grade 5 theory and Grade 5 practical, then the participant will be considered as undergraduate music major student categories. To differentiate musician and non-musician respondent, the respondent was required to answer the following question: 'Have you taken any recognised formal music examinations? (eg. Associated Board of the Royal Schools of Music (ABRSM), Trinity College of Music, Rockschoo)'. The respondent would need to fill in their highest qualification in practical and theory examination if they answered yes. And if the respondent answered no, they fall in the non-musician category. Additionally, for non-music major undergraduate students that had a minimum requirement of formal music qualification Grade 8 theory and Grade 8 practical, were considered them as musician category.

Participants were required to fill in the demographic form that included their basic information before the questionnaire. Participants were randomly choosing to do this study, age ranged from 19 to 30 years old. The demographic information is presented in Table 3.1 below.

Table 3.1

Profile of the Participants

Demographic		N	%
Musician's gender	Male	14	22.58
	Female	48	77.42
Total		62	100%
Non-musician's gender	Male	17	27.87
	Female	44	72.13
Total		61	100%

3.3 Data Collection Procedures

Data collection for this study was conducted from November 2019 to December 2019. All 123 participants participated the study in the Google form that prepared by researcher. All of the participants were required to fill in a short demographic questionnaire, indicating name, age, gender, whether or not they have minimum of Grade 5 ABRSM practical and theory qualification, and whether or not they currently had any mood or emotional disorders that required treatment.

All of the participants listened 4 different types of music genre excerpts accordingly after that. First, they listened to classical music genre, after they finish listened to it, they have to rate 28 emotions that stated in Circumplex Model of Emotion using Likert-scale, where '1' representing 'not very' (e.g. not very excited), and '5' representing 'very' (e.g. very excited). Participants were required to rate their affective response after they done listening an excerpt, before listening to the next excerpt. Data for this study were collected and analysed based on Google form result.

3.3.1 Music listening materials

The following (Table 3.2) is the list of music listening excerpts for the study. The excerpts included three representative examples from each of the four music genres. These excerpts were recommended by three experienced music lecturers in teaching the Music Appreciation course in University of Malaya.

Table 3.2

Music Listening Materials

Music Genre	Repertoire
Classical Music	Joseph Haydn Allegro in F Major, No. 2 from “12 Easy Pieces”
	Wolfgang Amadeus Mozart Minuet in D Major, K. 94/73h
	Ludwig van Beethoven Bagatelle in C minor, WoO 54, LUSTIC TRAUIG
Romantic Music	Frederick Chopin Waltz in A minor, B.150, Op. Posth
	Franz Liszt Klavierstück in F-sharp Major, S.193
	Sergei Rachmaninoff Lilacs Op.21 No.5
Atonal Music	Arnold Schoenberg Suite for Klavier, Op.25: Gavotte
	Alban Berg Twelve Variations on an original theme for piano (Variation XI)
	Anton Webern Variations for Piano op. 27: III. Ruhig fließend

(Table 3.2, continued)

Music Genre	Repertoire
Experimental Music	John Cage Music of Changes Charles Ives Some South-Paw Pitching Phillip Glass Mad Rush

All the selected listening excerpts above are of low familiarity. As Ritossa and Rickard (2004) mentioned, they found that familiarity of a song will affect the emotions perceived in the music by the listeners, which may contribute to the potential threats to reliability of the study. For instance, rating of pleasant emotions increased with the increasing of the familiarity of the piece, whereas rating of pleasant emotions decreased when the listeners found that the pieces were unfamiliar to them. Furthermore, the excerpts chosen were all piano pieces. From the chosen excerpts, it is predictable that the results may indicate the participants are probably to have more pleasant feelings listening to classical music and romantic music.

3.4 Data Analysis Procedures

Data analysis for this study was performed to examine the affective responses in the music listening among undergraduates' student using Circumplex Model of Emotion by listening to four different music genres of piano pieces. There were three selected piano pieces for each of the music genre, therefore the participants were required to listen to 12 excerpts in total. Since the results were generated based on music genre, participants that rated 28 emotions stated in Circumplex Model of Emotion using Likert-scale will be calculated and divided by three to find out the mean score.

There were four quadrants in Circumplex Model of Emotion, and categorised as: high arousal (HA) and positive valence (PV), high arousal (HA) and negative valence (NV), low arousal (LA) and negative valence (NV), low arousal (LA) and positive valence (PV). The emotions in each quadrant were classified and ranked based on the mean score, with highest mean score on top and lowest mean score on bottom. The average mean score on each quadrant were calculated and the highest average mean score among the four quadrants and the highest mean score for each emotion among the 28 emotions in Circumplex Model of Emotion would represent the music genre.

To find the differences in the ranges of affective responses between undergraduate music major and non-music major students listening to four types of music genre, mean difference was calculated. The difference of mean score for each emotion in each quadrant between music major and non-music major undergraduates' student were calculated and ranked to find out which emotion and which quadrant in Circumplex Model of Emotion has the largest mean difference.

All the results would be generated in line graphs through SPSS using mean scores for every emotions and quadrants, as classified by the music genre and each quadrant accordingly. As what Tukey (1977) indicated that, an overall picture of the data is much easier to be presented visually than with numerical figures.

3.5 Conclusion

Chapter 3 had presented the methodology of this study which included research design, participants, data collection procedure, and data analysis procedure for this study.

CHAPTER 4

DATA ANALYSIS AND FINDINGS

4.1 Overview

This chapter presents the statistical analysis of data and the results of the study. The sections are organised as follows: (1) affect responses of undergraduate music major students; (2) affect responses of undergraduate non-music major students; (3) differences in the ranges of affective responses between undergraduate music major and non-music major students; and (4) summary of results. The results were presented to address the research questions of the study. The research questions included:

1. What are the affective responses of undergraduate music major students listening to classical, romantic, atonal and experimental music?
2. What are the affective responses of undergraduate non-music major students listening to classical, romantic, atonal and experimental music?
3. What are the differences in the ranges of affective responses between undergraduate music major and non-music major students listening to classical, romantic, atonal and experimental music?

The purpose of this research aims to investigate the affective responses of undergraduate music major and non-music major students in music listening to four different music genres: (1) classical music; (2) romantic music; (3) atonal music; and (4) experimental music.

4.2 Affective Responses of Undergraduate Music Major Students

To address research question 1, an analysis of mean, standard deviation was generated using SPSS. The result was categorised in four different quadrants of emotions in Russell's Circumplex Model of Emotion, as shown in tables and figures below. The four different quadrants of emotions are: high arousal (HA) and positive valence (PV), high arousal (HA) and negative valence (NV), low arousal (LA) and negative valence (NV), low arousal (LA) and positive valence (PV).

4.2.1 Classical Music

The following presents a discussion on four different quadrants of emotions: (1) high arousal (HA) and positive valence (PV); (2) high arousal (HA) and negative valence (NV); (3) low arousal (LA) and negative valence (NV); and (4) low arousal (LA) and positive valence (PV) when undergraduate music major students listen to classical music.

4.2.1.1 High Arousal (HA) and Positive Valence (PV) emotion

Table 4.1 below displays the descriptive statistics of classical music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and positive valence (PV) when the musicians listen to classical music are ranked as: (1) delighted (3.58); (2) pleased (3.48); (3) glad (3.47); (4) happy (3.46); (5) excited (3.22); (6) amused (3.02); (7) astonished (2.86), with 'delighted' ranked at the top and 'astonished' ranked at the lowest. The mean score of seven HA and PV emotion are 3.30 and ranged from 2.86 (*Astonished*) to 3.58 (*Delighted*).

Table 4.1

Means, standard deviations, median and ranking for HA, PV emotion in musicians' Classical music listening

Classical Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Astonished	2.86	1.17	1.00	5.00	3.00	7
Excited	3.22	1.05	1.00	5.00	3.00	5
Amused	3.02	1.11	1.00	5.00	3.00	6
Happy	3.46	1.07	1.00	5.00	4.00	4
Delighted	3.58	1.08	1.00	5.00	4.00	1
Glad	3.47	1.04	1.00	5.00	4.00	3
Pleased	3.48	1.02	1.00	5.00	4.00	2
Average	3.30					

4.2.1.2 High Arousal (HA) and Negative Valence (NV) emotion

Table 4.2 below displays the descriptive statistics of classical music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and negative valence (NV) when the musicians listen to classical music are ranked as: (1) distressed (1.95); (2) alarmed (1.80); (3) tense (1.78); (4) afraid (1.75); (5) frustrated (1.72); (6) annoyed (1.69); (7) angry (1.60), with 'distressed' ranked at the top and 'angry' ranked at the lowest. The mean score of seven HA and NV emotion are 1.76 and ranged from 1.60 (*Angry*) to 1.95 (*Distressed*).

Table 4.2

Means, standard deviations, median and ranking for HA, NV emotion in musicians' Classical music listening

Classical Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Afraid	1.75	.84	1.00	4.00	2.00	4
Alarmed	1.80	.92	1.00	4.00	2.00	2
Angry	1.60	.81	1.00	4.00	1.00	7
Tense	1.78	.91	1.00	4.00	2.00	3
Frustrated	1.72	.91	1.00	4.00	1.00	5
Annoyed	1.69	.89	1.00	5.00	1.00	6
Distressed	1.95	1.05	1.00	5.00	2.00	1
Average	1.76					

4.2.1.3 Low Arousal (LA) and Negative Valence (NV) emotion

Table 4.3 below displays the descriptive statistics of classical music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and negative valence (NV) when the musicians listen to classical music are ranked as: (1) gloomy (1.98); (2) droopy (1.93); (3) miserable (1.91); (4) bored (1.88); (5) sad (1.87); (6) depressed (1.86), with 'gloomy' ranked at the top and 'depressed' ranked at the lowest. The mean score of six LA and NV emotion are 1.91 and ranged from 1.86 (*Depressed*) to 1.98 (Gloomy).

Table 4.3

Means, standard deviations, median and ranking for LA, NV emotion in musicians' Classical music listening

Classical Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Miserable	1.91	1.05	1.00	5.00	2.00	3
Sad	1.87	1.02	1.00	5.00	2.00	5
Depressed	1.86	1.05	1.00	5.00	2.00	6
Gloomy	1.98	1.07	1.00	5.00	2.00	1
Bored	1.88	.95	1.00	5.00	2.00	4
Droopy	1.93	.96	1.00	4.00	2.00	2
Average	1.91					

4.2.1.4 Low Arousal (LA) and Positive Valence (PV) emotion

Table 4.4 below displays the descriptive statistics of classical music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and positive valence (PV) when the musicians listen to classical music are ranked as: (1) relaxed (3.47); (2) calm (3.36); (3) satisfied (3.31); (4) at ease (3.29); (5) serene (3.16); (6) content (2.98); (7) tired (1.86); (8) sleepy (1.85) with 'relaxed' ranked at the top and 'sleepy' ranked at the lowest. The mean score of eight LA and PV emotion are 2.91 and ranged from 1.85 (*Sleepy*) to 3.47 (*Relaxed*).

Table 4.4

Means, standard deviations, median and ranking for LA, PV emotion in musicians' Classical music listening

Classical Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Content	2.98	1.06	1.00	5.00	3.00	6
Satisfied	3.31	.96	1.00	5.00	3.00	3
Serene	3.16	.94	1.00	5.00	3.00	5
At ease	3.29	.97	1.00	5.00	3.00	4
Calm	3.36	.99	1.00	5.00	3.00	2
Relaxed	3.47	.99	1.00	5.00	4.00	1
Tired	1.86	.94	1.00	5.00	2.00	7
Sleepy	1.85	.99	1.00	5.00	2.00	8
Average	2.91					

4.2.1.5 Summary result of classical music listening based on Circumplex Model of Emotion (musicians)

The Figure 4.1 to Figure 4.4 below illustrates the mean score of the 4 quadrant: (Fig. 4.1) high arousal (HA) and positive valence (PV); (Fig. 4.2) high arousal (HA) and negative valence (NV); (Fig. 4.3) low arousal (LA) and negative valence (NV); and (Fig. 4.4) low arousal (LA) and positive valence (PV). From the four figures, the four emotion quadrants are ranked as: (1) HA and PV emotion (3.30); (2) LA and PV emotion (2.91); (3) LA and NV emotion (1.91); (4) HA and NV emotion (1.76).

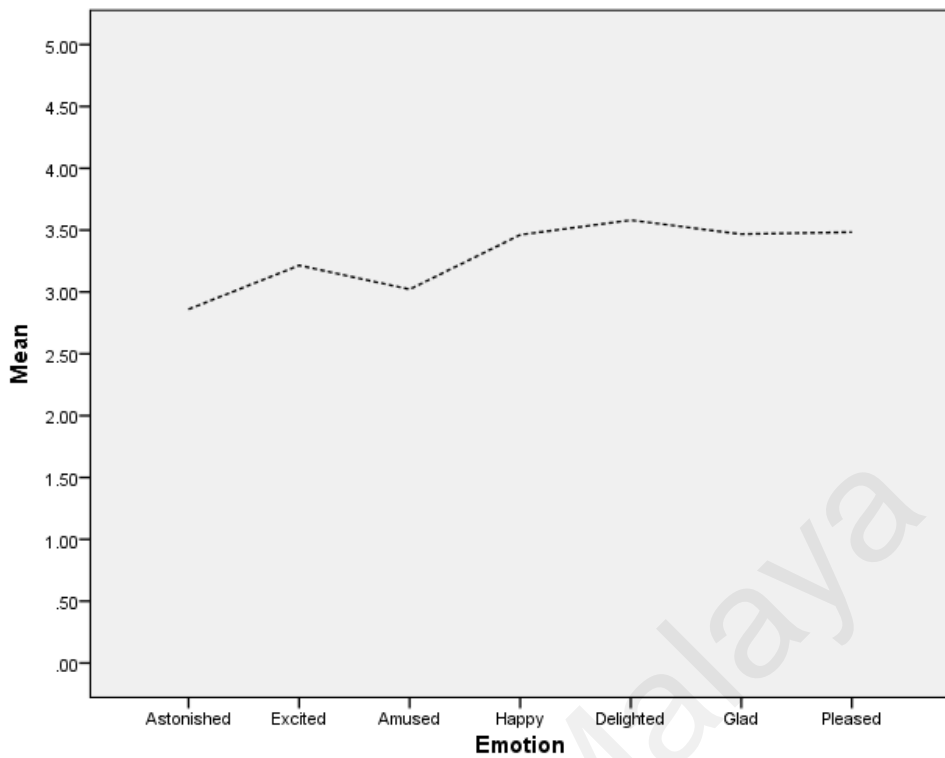


Figure 4.1 Classical music listening mean score for HA, PV emotion (musicians)

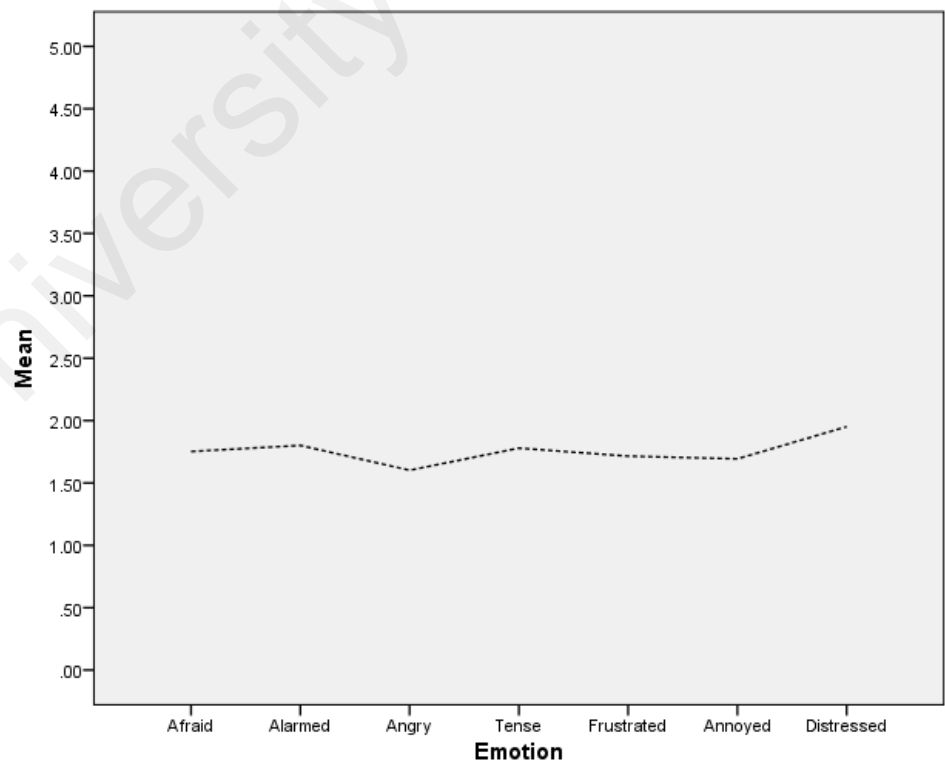


Figure 4.2 Classical music listening mean score for HA, NV emotion (musicians)

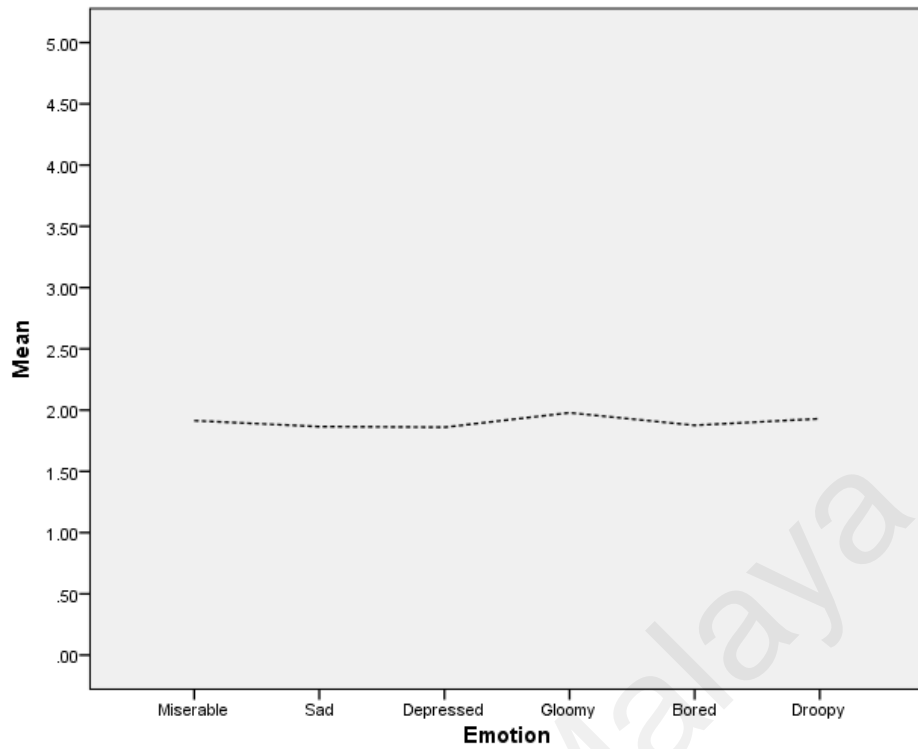


Figure 4.3 Classical music listening mean score for LA, NV emotion (musicians)

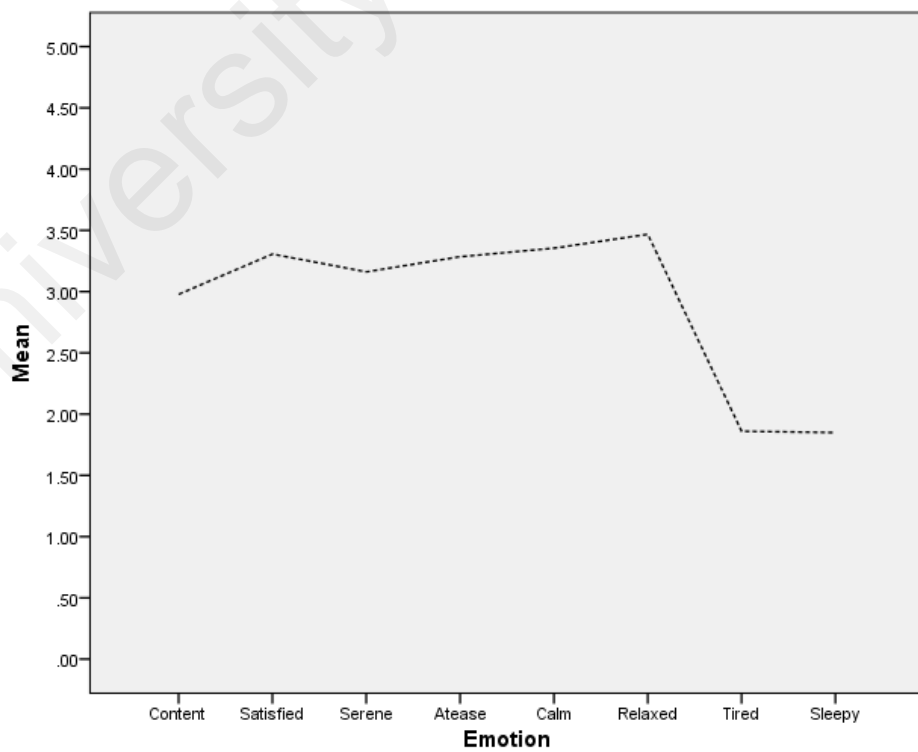


Figure 4.4 Classical music listening mean score for LA, PV emotion (musicians)

In sum, HA and PV emotion scored the highest average mean, with ‘delighted’ ranked at the top and ‘astonished’ ranked at the lowest. Followed by LA and PV emotion, with ‘relaxed’ ranked at the top and ‘tired’ ranked at the lowest. Third, LA and NV emotion, with ‘gloomy’ ranked at the top and ‘depressed’ ranked at the lowest. Lastly, HA and NV emotion scored the lowest average mean, with ‘distressed’ ranked at the top and ‘angry’ ranked at the lowest.

4.2.2 Romantic Music

The following presents a discussion on four different quadrants of emotions: (1) high arousal (HA) and positive valence (PV); (2) high arousal (HA) and negative valence (NV); (3) low arousal (LA) and negative valence (NV); and (4) low arousal (LA) and positive valence (PV) when undergraduate music major students listen to romantic music.

4.2.2.1 High Arousal (HA) and Positive Valence (PV) emotion

Table 4.5 below displays the descriptive statistics of romantic music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and positive valence (PV) when the musicians listen to romantic music are ranked as: (1) astonished (3.05); (2) excited (2.91); (3) amused (2.80); (4) pleased (2.74); (5) glad (2.61); (6) delighted (2.58); (7) happy (2.48), with ‘astonished’ ranked at the top and ‘happy’ ranked at the lowest. The mean score of seven HA and PV emotion are 2.74 and ranged from 2.48 (*Happy*) to 3.05 (*Astonished*).

Table 4.5

Means, standard deviations, median and ranking for HA, PV emotion in musicians' Romantic music listening

Romantic Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Astonished	3.05	1.18	1.00	5.00	3.00	1
Excited	2.91	1.15	1.00	5.00	3.00	2
Amused	2.80	1.17	1.00	5.00	3.00	3
Happy	2.48	1.00	1.00	5.00	2.00	7
Delighted	2.58	1.08	1.00	5.00	3.00	6
Glad	2.61	1.10	1.00	5.00	3.00	5
Pleased	2.74	1.11	1.00	5.00	3.00	4
Average	2.74					

4.2.2.2 High Arousal (HA) and Negative Valence (NV) emotion

Table 4.6 below displays the descriptive statistics of romantic music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and negative valence (NV) when the musicians listen to romantic music are ranked as: (1) tense (2.75); (2) distressed (2.54); (3) alarmed (2.44); (4) frustrated (2.44); (5) annoyed (2.31); (6) afraid (2.21); (7) angry (2.18), with 'tense' ranked at the top and 'angry' ranked at the lowest; and 'alarmed' and 'frustrated' sharing a same mean score (2.44). The mean score of seven HA and NV emotion are 2.41 and ranged from 2.18 (*Angry*) to 2.75 (*Tense*).

Table 4.6

Means, standard deviations, median and ranking for HA, NV emotion in musicians' Romantic music listening

Romantic Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Afraid	2.21	1.12	1.00	5.00	2.00	6
Alarmed	2.44	1.24	1.00	5.00	2.00	3
Angry	2.18	1.18	1.00	5.00	2.00	7
Tense	2.75	1.31	1.00	5.00	3.00	1
Frustrated	2.44	1.29	1.00	5.00	2.00	4
Annoyed	2.31	1.29	1.00	5.00	2.00	5
Distressed	2.54	1.20	1.00	5.00	3.00	2
Average	2.41					

4.2.2.3 Low Arousal (LA) and Negative Valence (NV) emotion

Table 4.7 below displays the descriptive statistics of romantic music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and negative valence (NV) when the musicians listen to romantic music are ranked as: (1) sad (2.78); (2) gloomy (2.77); (3) depressed (2.74); (4) miserable (2.65); (5) droopy (2.33); (6) bored (2.08), with 'sad' ranked at the top and 'bored' ranked at the lowest. The mean score of six LA and NV emotion are 2.56 and ranged from 2.08 (*Bored*) to 2.78 (*Sad*).

Table 4.7

Means, standard deviations, median and ranking for LA, NV emotion in musicians' Romantic music listening

Romantic Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Miserable	2.65	1.22	1.00	5.00	3.00	4
Sad	2.78	1.24	1.00	5.00	3.00	1
Depressed	2.74	1.20	1.00	5.00	3.00	3
Gloomy	2.77	1.18	1.00	5.00	3.00	2
Bored	2.08	.96	1.00	5.00	2.00	6
Droopy	2.33	1.13	1.00	4.00	2.00	5
Average	2.56					

4.2.2.4 Low Arousal (LA) and Positive Valence (PV) emotion

Table 4.8 below displays the descriptive statistics of romantic music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and positive valence (PV) when the musicians listen to romantic music are ranked as: (1) satisfied (3.11); (2) content (3.05); (3) serene (2.87); (4) at ease (2.77); (5) relaxed (2.73); (6) calm (2.70); (7) tired (2.13); (8) sleepy (2.06), with 'satisfied' ranked at the top and 'sleepy' ranked at the lowest. The mean score of eight LA and NV emotion are 2.68 and ranged from 2.06 (*Sleepy*) to 3.11 (*Satisfied*).

Table 4.8

Means, standard deviations, median and ranking for LA, PV emotion in musicians' Romantic music listening

Romantic Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Content	3.05	1.08	1.00	5.00	3.00	2
Satisfied	3.11	1.11	1.00	5.00	3.00	1
Serene	2.87	1.17	1.00	5.00	3.00	3
At ease	2.77	1.15	1.00	5.00	3.00	4
Calm	2.70	1.24	1.00	5.00	3.00	6
Relaxed	2.73	1.27	1.00	5.00	3.00	5
Tired	2.13	1.12	1.00	5.00	2.00	7
Sleepy	2.06	1.14	1.00	5.00	2.00	8
Average	2.68					

4.2.2.5 Summary result of romantic music listening based on Circumplex Model of Emotion (musicians)

The Figure 4.5 to Figure 4.8 below illustrates the mean score of the 4 quadrant: (Fig. 4.5) high arousal (HA) and positive valence (PV); (Fig. 4.6) high arousal (HA) and negative valence (NV); (Fig. 4.7) low arousal (LA) and negative valence (NV); and (Fig. 4.8) low arousal (LA) and positive valence (PV). From the four figures, the four emotion quadrants are ranked as: (1) HA and PV emotion (2.74); (2) LA and PV emotion (2.68); (3) LA and NV emotion (2.56); (4) HA and NV emotion (2.41).

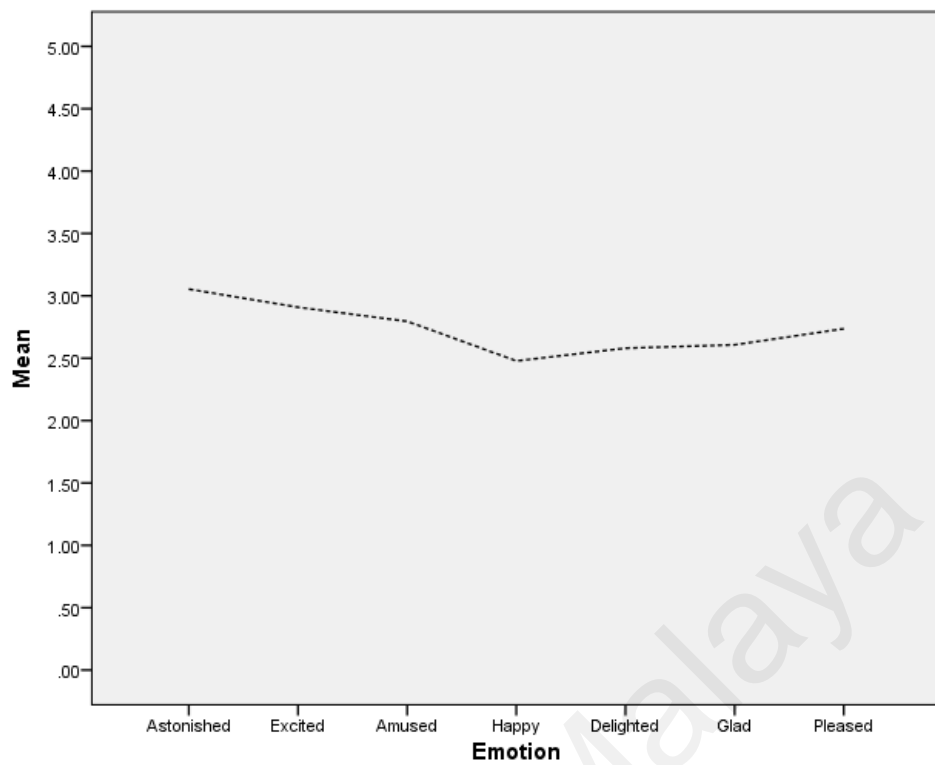


Figure 4.5 Romantic music listening mean score for HA, PV emotion (musicians)

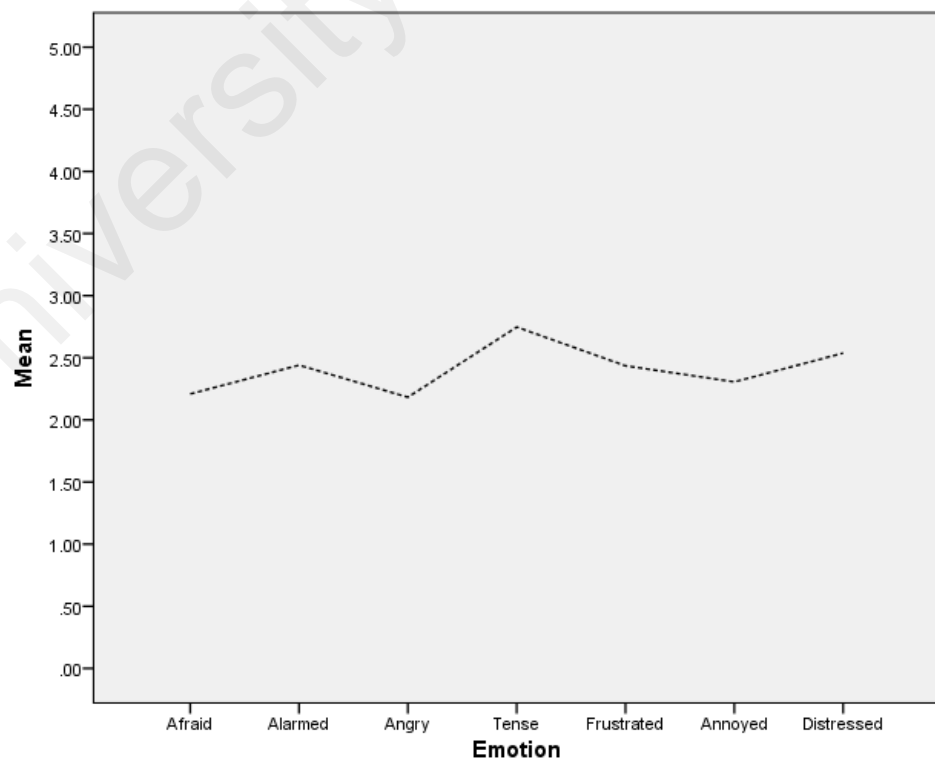


Figure 4.6 Romantic music listening mean score for HA, LV emotion (musicians)

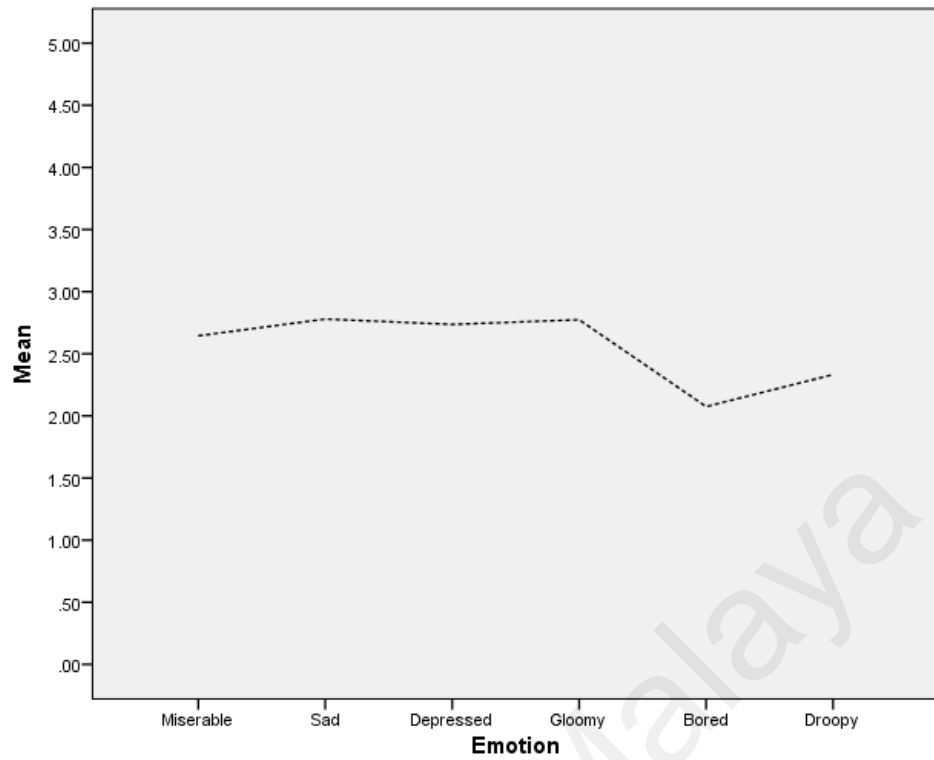


Figure 4.7 Romantic music listening mean score for LA, NV emotion (musicians)

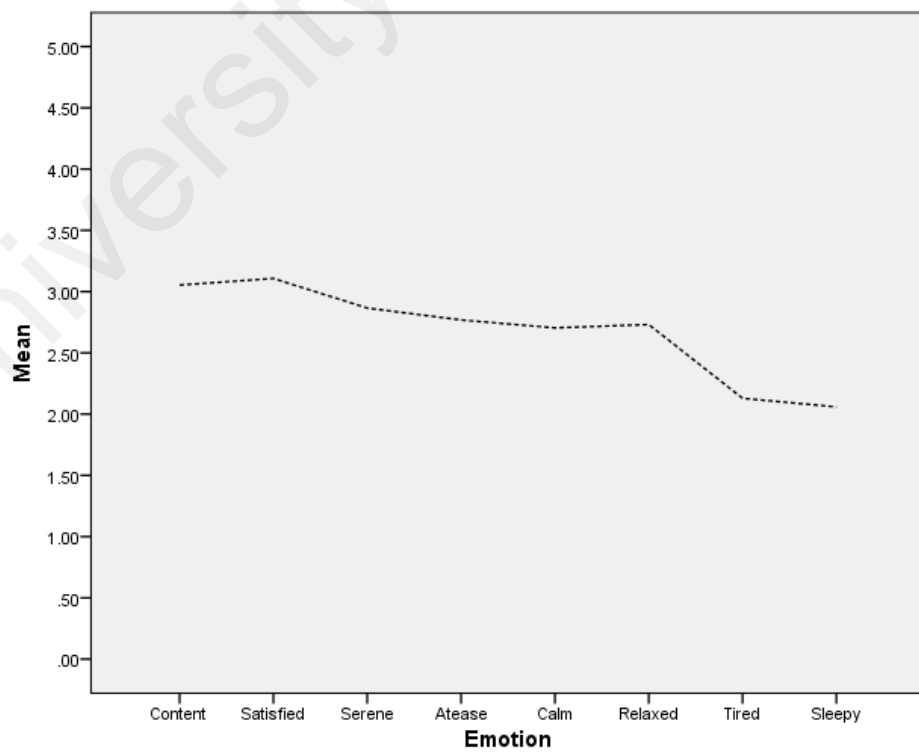


Figure 4.8 Romantic music listening mean score for LA, PV emotion (musicians)

In sum, HA and PV emotion scored the highest average mean, with ‘astonished’ ranked at the top and ‘happy’ ranked at the lowest. Followed by LA and PV emotion, with ‘satisfied’ ranked at the top and ‘sleepy’ ranked at the lowest. Third, LA and NV emotion, with ‘sad’ ranked at the top and ‘bored’ ranked at the lowest. Lastly, HA and NV emotion scored the lowest average mean, with ‘tense’ ranked at the top and ‘angry’ ranked at the lowest.

4.2.3 Atonal Music

The following presents a discussion on four different quadrants of emotions: (1) high arousal (HA) and positive valence (PV); (2) high arousal (HA) and negative valence (NV); (3) low arousal (LA) and negative valence (NV); and (4) low arousal (LA) and positive valence (PV) when undergraduate music major students listen to atonal music.

4.2.3.1 High Arousal (HA) and Positive Valence (PV) emotion

Table 4.9 below displays the descriptive statistics of atonal music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and positive valence (PV) when the musicians listen to atonal music are ranked as: (1) astonished (3.04); (2) amused (2.52); (3) excited (2.47); (4) delighted (2.21); (5) pleased (2.18); (6) happy (2.15); (7) glad (2.13), with ‘astonished’ ranked at the top and ‘glad’ ranked at the lowest. The mean score of seven HA and PV emotion are 2.39 and ranged from 2.13 (*Glad*) to 3.04 (*Astonished*).

Table 4.9

Means, standard deviations, median and ranking for HA, PV emotion in musicians' Atonal music listening

Atonal Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Astonished	3.04	1.18	1.00	5.00	3.00	1
Excited	2.47	1.07	1.00	5.00	2.00	3
Amused	2.52	1.16	1.00	5.00	2.50	2
Happy	2.15	1.00	1.00	5.00	2.00	6
Delighted	2.21	1.04	1.00	5.00	2.00	4
Glad	2.13	1.02	1.00	5.00	2.00	7
Pleased	2.18	1.00	1.00	5.00	2.00	5
Average	2.39					

4.2.3.2 High Arousal (HA) and Negative Valence (NV) emotion

Table 4.10 below displays the descriptive statistics of atonal music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and negative valence (NV) when the musicians listen to atonal music are ranked as: (1) tense (3.12); (2) annoyed (3.03); (3) alarmed (2.87); (4) frustrated (2.82); (5) distressed (2.78); (6) afraid (2.63); (7) angry (2.36), with 'tense' ranked at the top and 'angry' ranked at the lowest. The mean score of seven HA and NV emotion are 2.80 and ranged from 2.36 (*Angry*) to 3.12 (*Tense*).

Table 4.10

Means, standard deviations, median and ranking for HA, NV emotion in musicians' Atonal music listening

Atonal Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Afraid	2.63	1.26	1.00	5.00	3.00	6
Alarmed	2.87	1.35	1.00	5.00	3.00	3
Angry	2.36	1.13	1.00	5.00	2.00	7
Tense	3.12	1.22	1.00	5.00	3.00	1
Frustrated	2.82	1.25	1.00	5.00	3.00	4
Annoyed	3.03	1.33	1.00	5.00	3.00	2
Distressed	2.78	1.22	1.00	5.00	3.00	5
Average	2.80					

4.2.3.3 Low Arousal (LA) and Negative Valence (NV) emotion

Table 4.11 below displays the descriptive statistics of atonal music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and negative valence (NV) when the musicians listen to atonal music are ranked as: (1) miserable (2.65); (2) gloomy (2.62); (3) depressed (2.52); (4) bored (2.51); (5) droopy (2.45); (6) sad (2.21), with 'miserable' ranked at the top and 'sad' ranked at the lowest. The mean score of six LA and NV emotion are 2.49 and ranged from 2.21 (*Sad*) to 2.65 (*Miserable*).

Table 4.11

Means, standard deviations, median and ranking for LA, NV emotion in musicians' Atonal music listening

Atonal Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Miserable	2.65	1.22	1.00	5.00	3.00	1
Sad	2.21	1.10	1.00	5.00	2.00	6
Depressed	2.52	1.22	1.00	5.00	2.50	3
Gloomy	2.62	1.26	1.00	5.00	3.00	2
Bored	2.51	1.22	1.00	5.00	2.00	4
Droopy	2.45	1.21	1.00	4.00	2.00	5
Average	2.49					

4.2.3.4 Low Arousal (LA) and Positive Valence (PV) emotion

Table 4.12 below displays the descriptive statistics of atonal music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and positive valence (PV) when the musicians listen to atonal music are ranked as: (1) content (2.51); (2) satisfied (2.45); (3) sleepy (2.22); (4) tired (2.19); (5) serene (2.15); (6) relaxed (2.13); (7) at ease (2.07); (8) calm (2.07), with 'content' ranked at the top and 'at ease, calm' ranked at the lowest; and 'at ease' and 'calm' sharing a same mean score (2.07). The mean score of eight LA and NV emotion are 2.22 and ranged from 2.07 (*At ease, Calm*) to 2.51 (*Content*).

Table 4.12

Means, standard deviations, median and ranking for LA, PV emotion in musicians' Atonal music listening

Atonal Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Content	2.51	1.11	1.00	5.00	2.00	1
Satisfied	2.45	1.14	1.00	5.00	2.00	2
Serene	2.15	1.09	1.00	5.00	2.00	5
At ease	2.07	1.05	1.00	5.00	2.00	7
Calm	2.07	1.14	1.00	5.00	2.00	8
Relaxed	2.13	1.15	1.00	5.00	2.00	6
Tired	2.19	1.15	1.00	5.00	2.00	4
Sleepy	2.22	1.25	1.00	5.00	2.00	3
Average	2.22					

4.2.3.5 Summary result of atonal music listening based on Circumplex Model of Emotion (musicians)

The Figure 4.9 to Figure 4.12 below illustrates the mean score of the 4 quadrant: (Fig. 4.9) high arousal (HA) and positive valence (PV); (Fig. 4.10) high arousal (HA) and negative valence (NV); (Fig. 4.11) low arousal (LA) and negative valence (NV); and (Fig. 4.12) low arousal (LA) and positive valence (PV). From the four figures, the four emotion quadrants are ranked as: (1) HA and NV emotion (2.80); (2) LA and NV emotion (2.49); (3) HA and PV emotion (2.39); (4) LA and PV emotion (2.22).

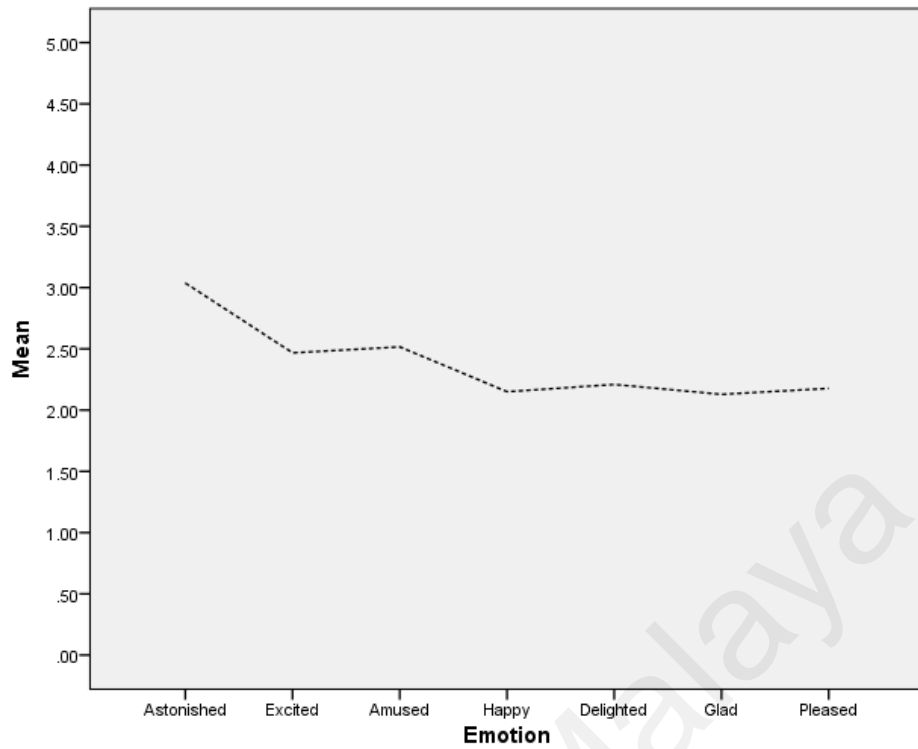


Figure 4.9 Atonal music listening mean score for HA, PV emotion (musicians)

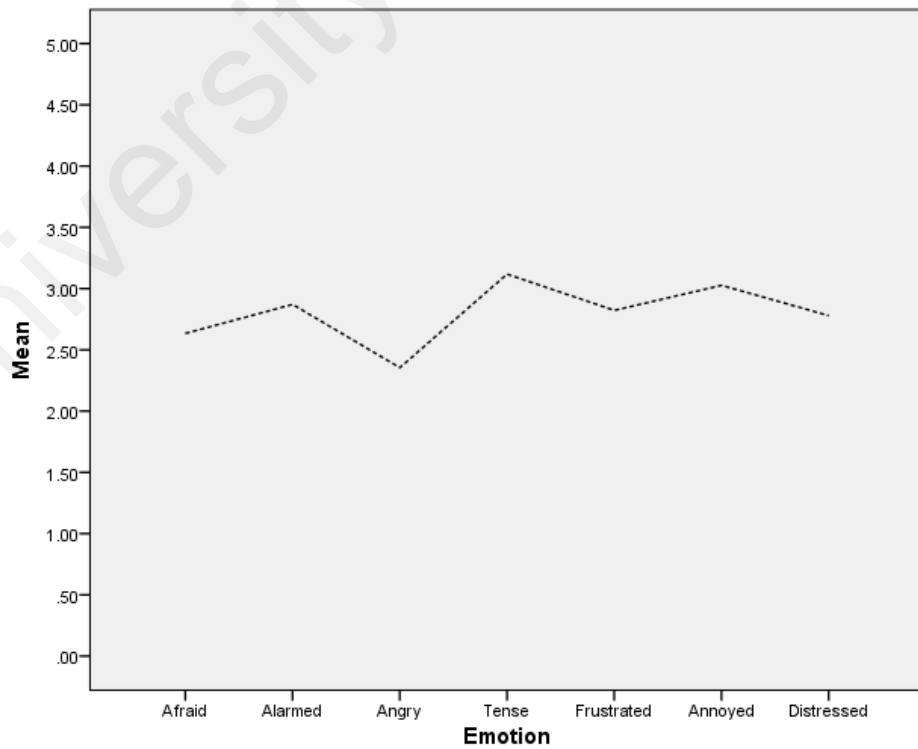


Figure 4.10 Atonal music listening mean score for HA, NV emotion (musicians)

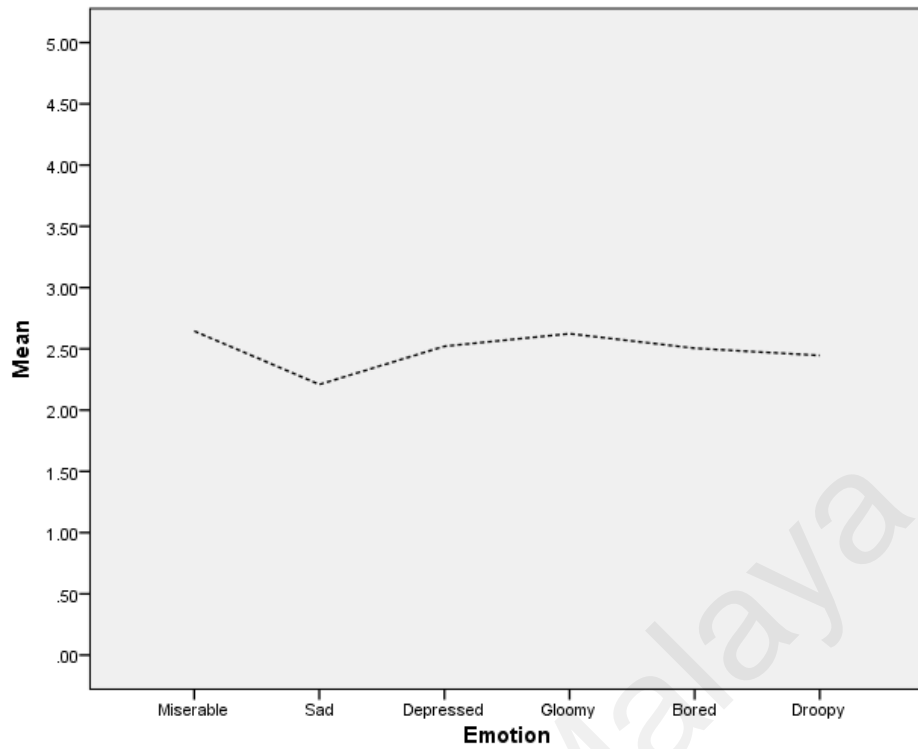


Figure 4.11 Atonal music listening mean score for LA, NV emotion (musicians)

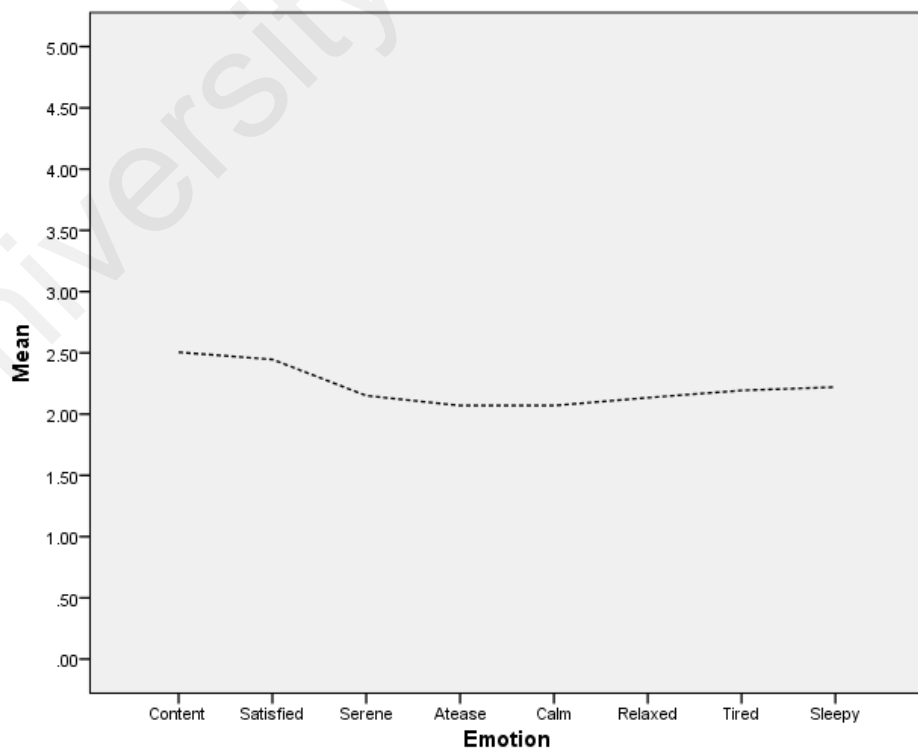


Figure 4.12 Atonal music listening mean score for LA, PV emotion (musicians)

In sum, HA and NV emotion scored the highest average mean, with 'tense' ranked at the top and 'angry' ranked at the lowest. Followed by LA and NV emotion, with 'miserable' ranked at the top and 'sad' ranked at the lowest. Third, HA and PV emotion, with 'astonished' ranked at the top and 'glad' ranked at the lowest. Lastly, LA and PV emotion scored the lowest average mean, with 'content' ranked at the top and 'at ease, calm' ranked at the lowest.

4.2.4 Experimental Music

The following presents a discussion on four different quadrants of emotions: (1) high arousal (HA) and positive valence (PV); (2) high arousal (HA) and negative valence (NV); (3) low arousal (LA) and negative valence (NV); and (4) low arousal (LA) and positive valence (PV) when undergraduate music major students listen to experimental music.

4.2.4.1 High Arousal (HA) and Positive Valence (PV) emotion

Table 4.13 below displays the descriptive statistics of experimental music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and positive valence (PV) when the musicians listen to experimental music are ranked as: (1) astonished (3.13); (2) excited (2.43); (3) amused (2.38); (4) delighted (1.95); (5) glad (1.95); (6) happy (1.94); (7) pleased (1.92), with 'astonished' ranked at the top and 'pleased' ranked at the lowest; and 'delighted' and 'glad' sharing a same mean score (1.95). The mean score of seven HA and PV emotion are 2.24 and ranged from 1.92 (*Pleased*) to 3.13 (*Astonished*).

Table 4.13

Means, standard deviations, median and ranking for HA, PV emotion in musicians' Experimental music listening

Experimental Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Astonished	3.13	1.33	1.00	5.00	3.00	1
Excited	2.43	1.28	1.00	5.00	2.00	2
Amused	2.38	1.30	1.00	5.00	2.00	3
Happy	1.94	1.00	1.00	4.00	2.00	6
Delighted	1.95	.99	1.00	5.00	2.00	4
Glad	1.95	1.06	1.00	5.00	2.00	5
Pleased	1.92	1.00	1.00	5.00	2.00	7
Average	2.24					

4.2.4.2 High Arousal (HA) and Negative Valence (NV) emotion

Table 4.14 below displays the descriptive statistics of experimental music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and negative valence (NV) when the musicians listen to experimental music are ranked as: (1) tense (3.66); (2) annoyed (3.52); (3) frustrated (3.48); (4) alarmed (3.45); (5) angry (3.01); (6) distressed (2.98); (7) afraid (2.88), with 'tense' ranked at the top and 'afraid' ranked at the lowest. The mean score of seven HA and NV emotion are 3.28 and ranged from 2.88 (*Afraid*) to 3.66 (*Tense*).

Table 4.14

Means, standard deviations, median and ranking for HA, NV emotion in musicians' Experimental music listening

Experimental Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Afraid	2.88	1.35	1.00	5.00	3.00	7
Alarmed	3.45	1.32	1.00	5.00	4.00	4
Angry	3.01	1.37	1.00	5.00	3.00	5
Tense	3.66	1.20	1.00	5.00	4.00	1
Frustrated	3.48	1.22	1.00	5.00	4.00	3
Annoyed	3.52	1.27	1.00	5.00	4.00	2
Distressed	2.98	1.37	1.00	5.00	3.00	6
Average	3.28					

4.2.4.3 Low Arousal (LA) and Negative Valence (NV) emotion

Table 4.15 below displays the descriptive statistics of experimental music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and negative valence (NV) when the musicians listen to experimental music are ranked as: (1) miserable (2.84); (2) bored (2.76); (3) depressed (2.73); (4) gloomy (2.62); (5) droopy (2.55); (6) sad (2.17), with 'miserable' ranked at the top and 'sad' ranked at the lowest. The mean score of six LA and NV emotion are 2.61 and ranged from 2.17 (*Sad*) to 2.84 (*Miserable*).

Table 4.15

Means, standard deviations, median and ranking for LA, NV emotion in musicians' Experimental music listening

Atonal Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Miserable	2.84	1.38	1.00	5.00	3.00	1
Sad	2.17	1.07	1.00	5.00	2.00	6
Depressed	2.73	1.30	1.00	5.00	3.00	3
Gloomy	2.62	1.24	1.00	5.00	3.00	4
Bored	2.76	1.28	1.00	5.00	3.00	2
Droopy	2.55	1.19	1.00	5.00	3.00	5
Average	2.61					

4.2.4.4 Low Arousal (LA) and Positive Valence (PV) emotion

Table 4.16 below displays the descriptive statistics of experimental music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and positive valence (PV) when the musicians listen to experimental music are ranked as: (1) content (2.43); (2) tired (2.26); (3) satisfied (2.24); (4) sleepy (2.16); (5) serene (1.91); (6) at ease (1.83); (7) calm (1.83); (8) relaxed (1.80), with 'content' ranked at the top and 'relaxed' ranked at the lowest; and 'at ease' and 'calm' sharing a same mean score (1.83). The mean score of eight LA and NV emotion are 2.06 and ranged from 1.80 (*Relaxed*) to 2.43 (*Content*).

Table 4.16

Means, standard deviations, median and ranking for LA, PV emotion in musicians' Experimental music listening

Experimental Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Content	2.43	1.19	1.00	5.00	2.00	1
Satisfied	2.24	1.17	1.00	5.00	2.00	3
Serene	1.91	.99	1.00	5.00	2.00	5
At ease	1.83	.95	1.00	5.00	2.00	6
Calm	1.83	1.03	1.00	5.00	1.00	7
Relaxed	1.80	.97	1.00	5.00	1.00	8
Tired	2.26	1.21	1.00	5.00	2.00	2
Sleepy	2.16	1.26	1.00	5.00	2.00	4
Average	2.06					

4.2.4.5 Summary result of experimental music listening based on Circumplex Model of Emotion (musicians)

The Figure 4.13 to Figure 4.16 below illustrates the mean score of the 4 quadrant: (Fig. 4.13) high arousal (HA) and positive valence (PV); (Fig. 4.14) high arousal (HA) and negative valence (NV); (Fig. 4.15) low arousal (LA) and negative valence (NV); and (Fig. 4.16) low arousal (LA) and positive valence (PV). From the four figures, the four emotion quadrants are ranked as: (1) HA and NV emotion (3.28); (2) LA and NV emotion (2.61); (3) HA and PV emotion (2.24); (4) LA and PV emotion (2.06).

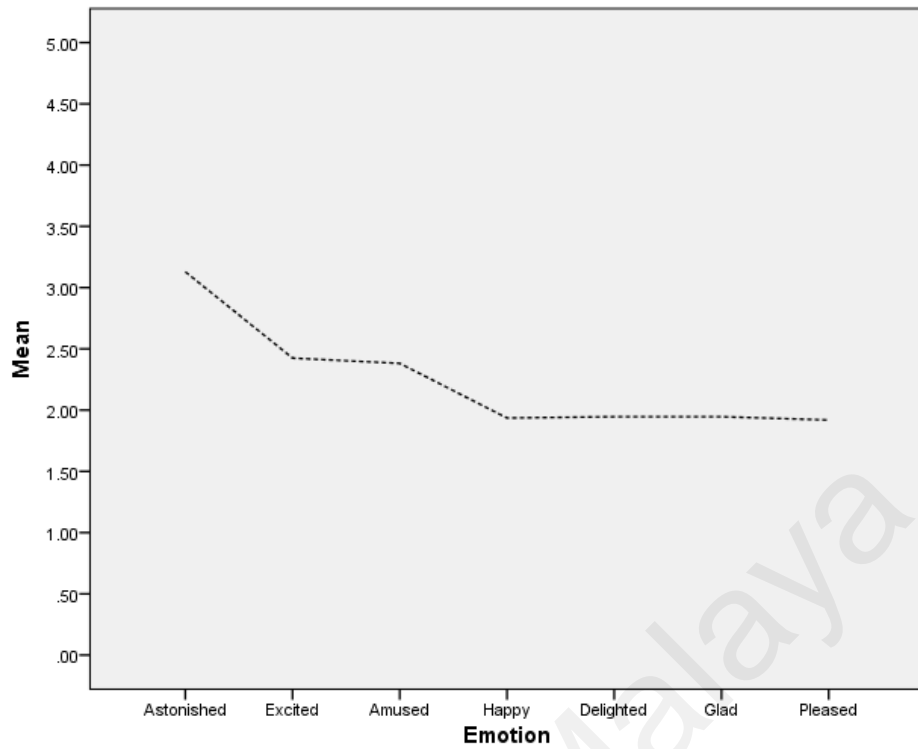


Figure 4.13 Experimental music listening mean score for HA, PV emotion (musicians)

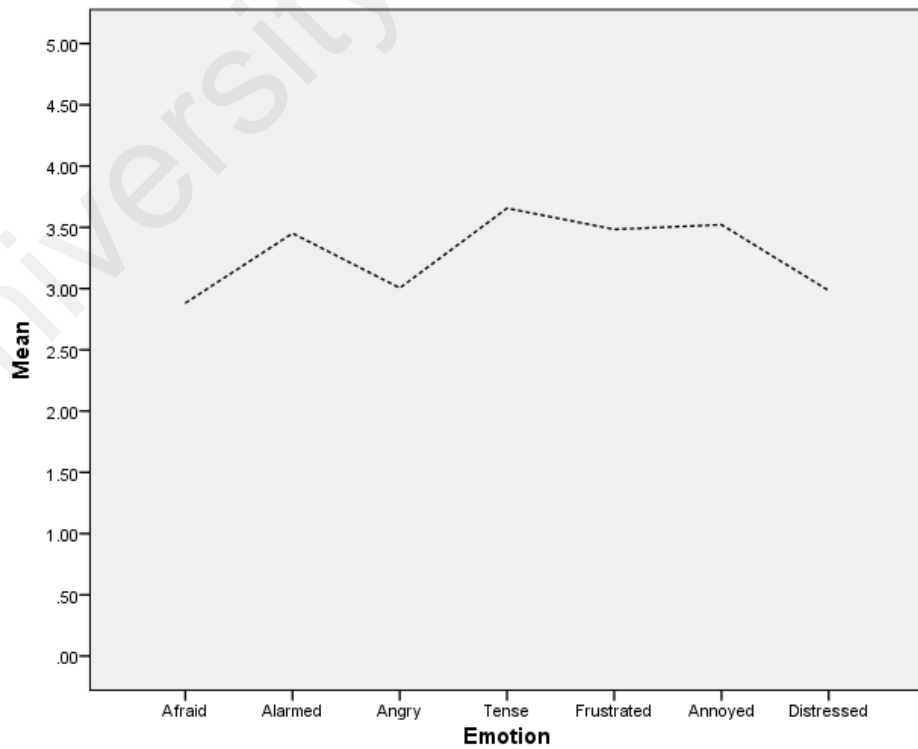


Figure 4.14 Experimental music listening mean score for HA, NV emotion (musicians)

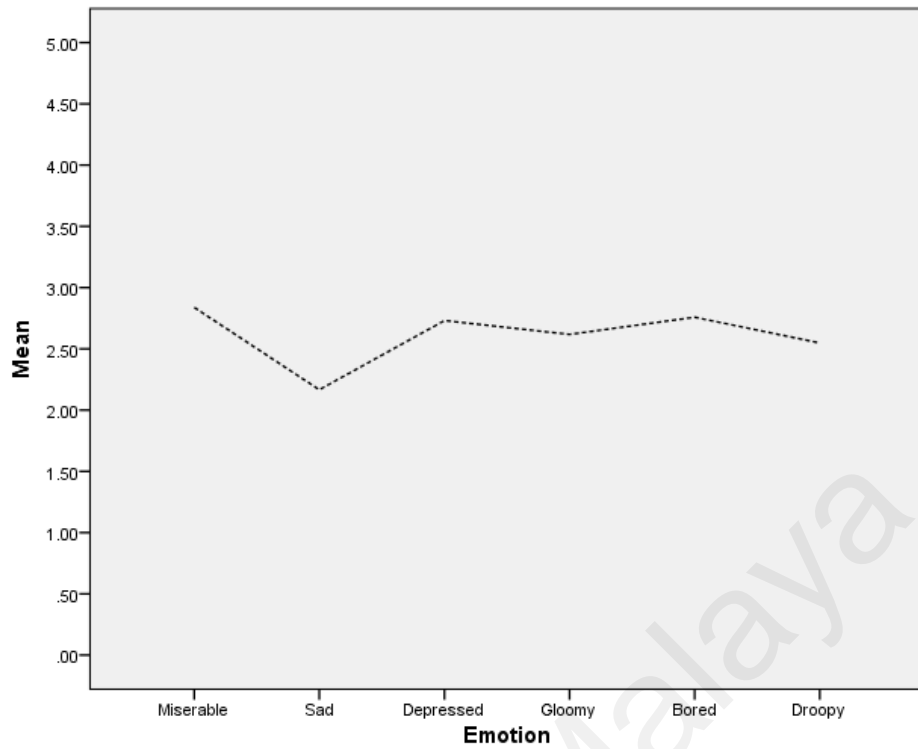


Figure 4.15 Experimental music listening mean score for LA, NV emotion (musicians)

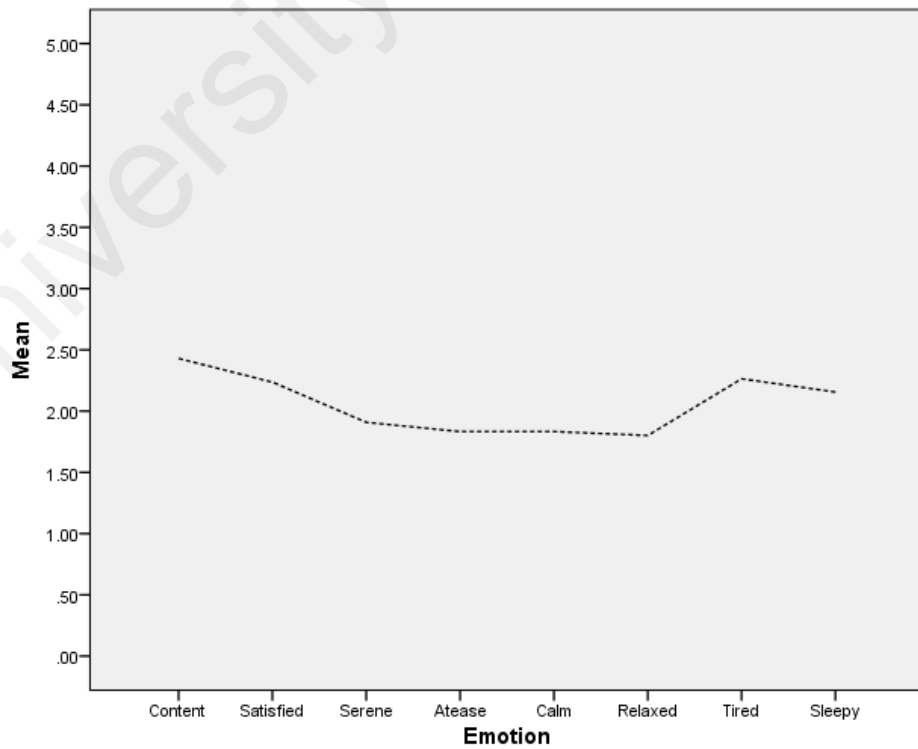


Figure 4.16 Experimental music listening mean score for LA, PV emotion (musicians)

In sum, HA and NV emotion scored the highest average mean, with ‘tense’ ranked at the top and ‘afraid’ ranked at the lowest. Followed by LA and NV emotion, with ‘miserable’ ranked at the top and ‘sad’ ranked at the lowest. Third, HA and PV emotion, with ‘astonished’ ranked at the top and ‘pleased’ ranked at the lowest. Lastly, LA and PV emotion scored the lowest average mean, with ‘content’ ranked at the top and ‘relaxed’ ranked at the lowest.

4.2.5 Summary of results on musicians’ listening to four different music genres

Table 4.17 below displays the summary result on mean scores for four different quadrants in Russell’s Circumplex of Emotion with four different music genres variable. In conclusion, the emotion quadrant that best described musician when they listens to four different music genres are as: (1) classical music – HA and PV emotion (3.30); (2) romantic music – HA and PV emotion (2.74); (3) atonal music – HA and NV emotion (2.80); (4) experimental music – HA and NV emotion (3.28).

Table 4.17

Means for 4 quadrants of emotion when musicians’ listening to four different music genres

Variables	HA, PV	HA, NV	LA, NV	LA, PV
Classical Music	3.30	1.76	1.91	2.91
Romantic Music	2.74	2.41	2.56	2.68
Atonal Music	2.39	2.80	2.49	2.22
Experimental Music	2.24	3.28	2.61	2.06

The Figure 4.17 below illustrates the mean score of the 4 quadrants. From the figure, HA and PV emotion are ranked as: (1) classical music; (2) romantic music; (3) atonal music; (4) experimental music. HA and NV emotion are ranked as: (1) experimental music; (2) atonal music; (3) romantic music; (4) classical music. LA and NV emotion are ranked as: (1) experimental music; (2) romantic music; (3) atonal music; (4) classical music. LA and PV emotion are ranked as: (1) classical music; (2) romantic music; (3) atonal music; (4) experimental music.

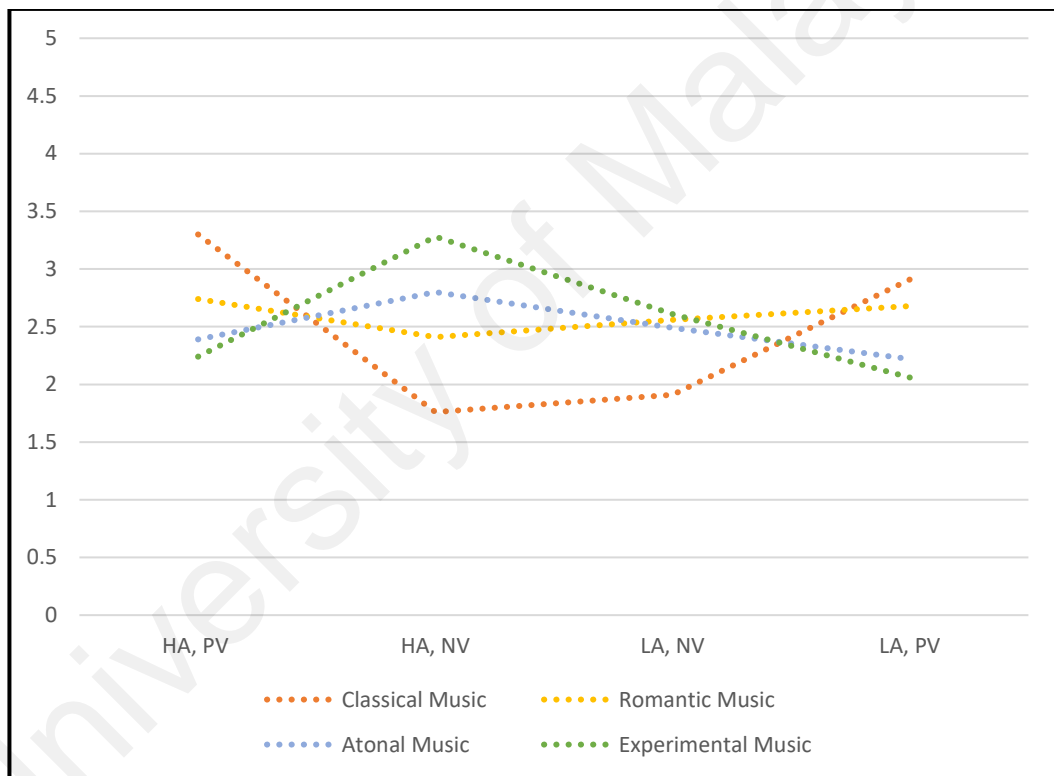


Figure 4.17 Mean score for 4 quadrants of emotion when musicians listening to four different music genres

4.3 Affective Responses of Undergraduate Non-music Major Students

To address research question 2, an analysis of mean, standard deviation was generated using SPSS. The result was categorised in four different quadrants of emotions in Russell's Circumplex Model of Emotion, as shown in tables and figures below. The four different quadrants of emotions are: high arousal (HA) and positive valence (PV), high arousal (HA) and negative valence (NV), low arousal (LA) and negative valence (NV), low arousal (LA) and positive valence (PV).

4.3.1 Classical Music

The following presents a discussion on four different quadrants of emotions: (1) high arousal (HA) and positive valence (PV); (2) high arousal (HA) and negative valence (NV); (3) low arousal (LA) and negative valence (NV); and (4) low arousal (LA) and positive valence (PV) when undergraduate non-music major students listen to classical music.

4.3.1.1 High Arousal (HA) and Positive Valence (PV) emotion

Table 4.18 below displays the descriptive statistics of classical music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and positive valence (PV) when the non-musicians listen to classical music are ranked as: (1) delighted (3.64); (2) happy (3.61); (3) pleased (3.56); (4) glad (3.51); (5) amused (3.24); (6) excited (3.12); (7) astonished (2.84), with 'delighted' ranked at the top and 'astonished' ranked at the lowest. The mean score of seven HA and PV emotion are 3.36 and ranged from 2.84 (*Astonished*) to 3.64 (*Delighted*).

Table 4.18

Means, standard deviations, median and ranking for HA, PV emotion in non-musicians' Classical music listening

Classical Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Astonished	2.84	1.11	1.00	5.00	3.00	7
Excited	3.12	1.10	1.00	5.00	3.00	6
Amused	3.24	1.12	1.00	5.00	3.00	5
Happy	3.61	1.09	1.00	5.00	4.00	2
Delighted	3.64	1.09	1.00	5.00	4.00	1
Glad	3.51	1.04	1.00	5.00	4.00	4
Pleased	3.56	1.07	1.00	5.00	4.00	3
Average	3.36					

4.3.1.2 High Arousal (HA) and Negative Valence (NV) emotion

Table 4.19 below displays the descriptive statistics of classical music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and negative valence (NV) when the non-musicians listen to classical music are ranked as: (1) distressed (1.84); (2) alarmed (1.57); (3) tense (1.53); (4) afraid (1.45); (5) frustrated (1.41); (6) annoyed (1.34); (7) angry (1.27), with 'distressed' ranked at the top and 'angry' ranked at the lowest. The mean score of seven HA and NV emotion are 1.49 and ranged from 1.27 (*Angry*) to 1.84 (*Distressed*).

Table 4.19

Means, standard deviations, median and ranking for HA, NV emotion in non-musicians' Classical music listening

Classical Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Afraid	1.45	.83	1.00	5.00	1.00	4
Alarmed	1.57	.92	1.00	4.00	1.00	2
Angry	1.27	.51	1.00	4.00	1.00	7
Tense	1.53	.93	1.00	5.00	1.00	3
Frustrated	1.41	.74	1.00	4.00	1.00	5
Annoyed	1.34	.63	1.00	4.00	1.00	6
Distressed	1.84	1.09	1.00	4.00	1.00	1
Average	1.49					

4.3.1.3 Low Arousal (LA) and Negative Valence (NV) emotion

Table 4.20 below displays the descriptive statistics of classical music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and negative valence (NV) when the non-musicians listen to classical music are ranked as: (1) gloomy (1.75); (2) sad (1.69); (3) miserable (1.64); (4) droopy (1.61); (5) depressed (1.57); (6) bored (1.51), with 'gloomy' ranked at the top and 'bored' ranked at the lowest. The mean score of six LA and NV emotion are 1.63 and ranged from 1.51 (*Bored*) to 1.75 (*Gloomy*).

Table 4.20

Means, standard deviations, median and ranking for LA, NV emotion in non-musicians' Classical music listening

Classical Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Miserable	1.64	.98	1.00	5.00	1.00	3
Sad	1.69	1.08	1.00	5.00	1.00	2
Depressed	1.57	.99	1.00	5.00	1.00	5
Gloomy	1.75	1.15	1.00	5.00	1.00	1
Bored	1.51	.80	1.00	5.00	1.00	6
Droopy	1.61	.91	1.00	5.00	1.00	4
Average	1.63					

4.3.1.4 Low Arousal (LA) and Positive Valence (PV) emotion

Table 4.21 below displays the descriptive statistics of classical music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and positive valence (PV) when the non-musicians listen to classical music are ranked as: (1) relaxed (3.54); (2) at ease (3.38); (3) calm (3.32); (4) satisfied (3.30); (5) serene (3.06); (6) content (2.92); (7) sleepy (1.71); (8) tired (1.59) with 'relaxed' ranked at the top and 'tired' ranked at the lowest. The mean score of eight LA and PV emotion are 2.85 and ranged from 1.59 (*Tired*) to 3.54 (*Relaxed*).

Table 4.21

Means, standard deviations, median and ranking for LA, NV emotion in non-musicians' Classical music listening

Classical Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Content	2.92	1.17	1.00	5.00	3.00	6
Satisfied	3.30	1.15	1.00	5.00	4.00	4
Serene	3.06	1.24	1.00	5.00	3.00	5
At ease	3.38	1.19	1.00	5.00	4.00	2
Calm	3.32	1.22	1.00	5.00	4.00	3
Relaxed	3.54	1.19	1.00	5.00	4.00	1
Tired	1.59	.87	1.00	5.00	1.00	8
Sleepy	1.71	.95	1.00	5.00	1.00	7
Average	2.85					

4.2.1.5 Summary result of classical music listening based on Circumplex Model of Emotion (non-musicians)

The Figure 4.18 to Figure 4.21 below illustrates the mean score of the 4 quadrant: (Fig. 4.18) high arousal (HA) and positive valence (PV); (Fig. 4.19) high arousal (HA) and negative valence (NV); (Fig. 4.20) low arousal (LA) and negative valence (NV); and (Fig. 4.21) low arousal (LA) and positive valence (PV). From the four figures, the four emotion quadrants are ranked as: (1) HA and PV emotion (3.36); (2) LA and PV emotion (2.85); (3) LA and NV emotion (1.63); (4) HA and NV emotion (1.49).

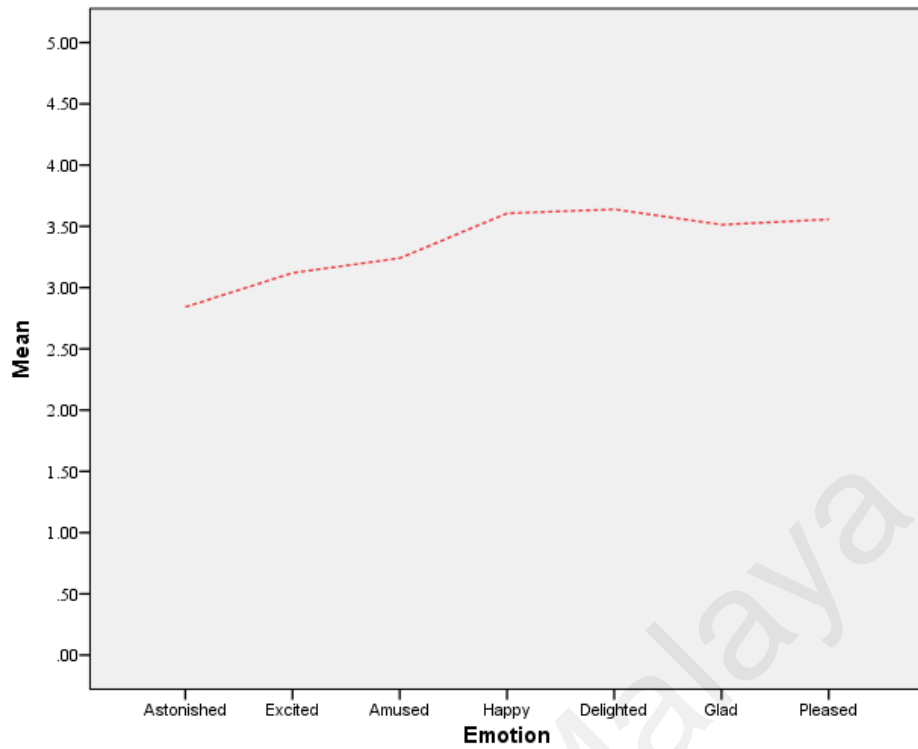


Figure 4.18 Classical music listening mean score for HA, PV emotion (non-musicians)

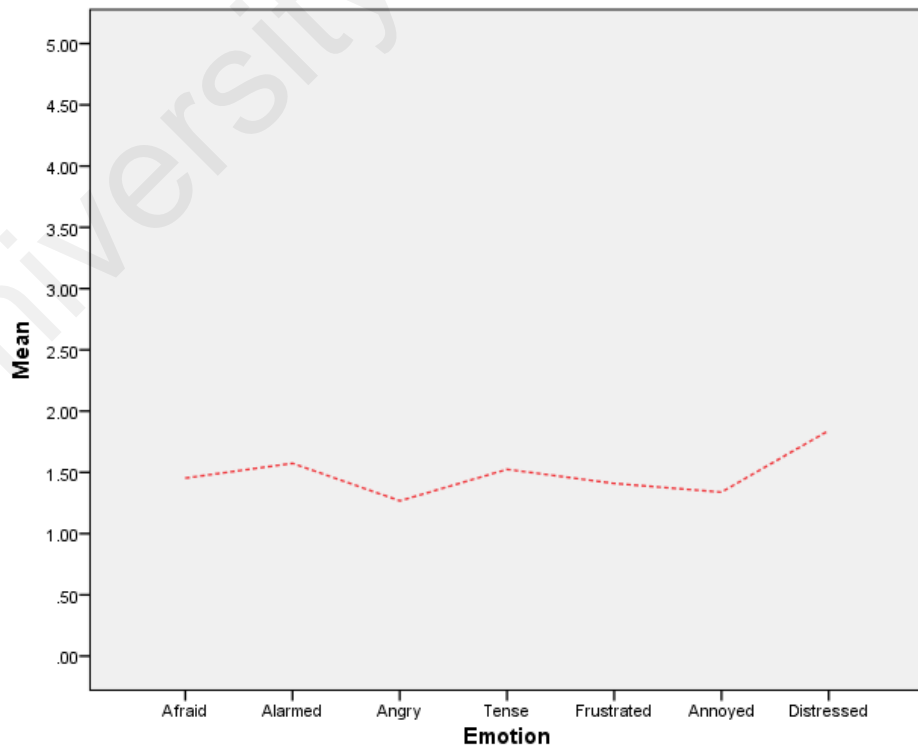


Figure 4.19 Classical music listening mean score for HA, NV emotion (non-musicians)

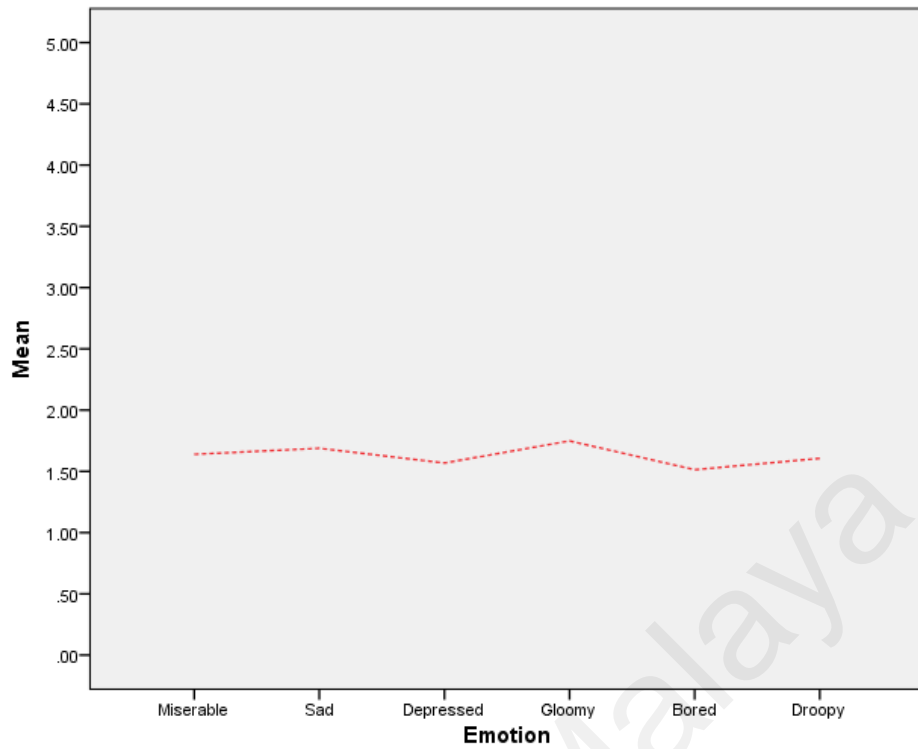


Figure 4.20 Classical music listening mean score for LA, NV emotion (non-musicians)

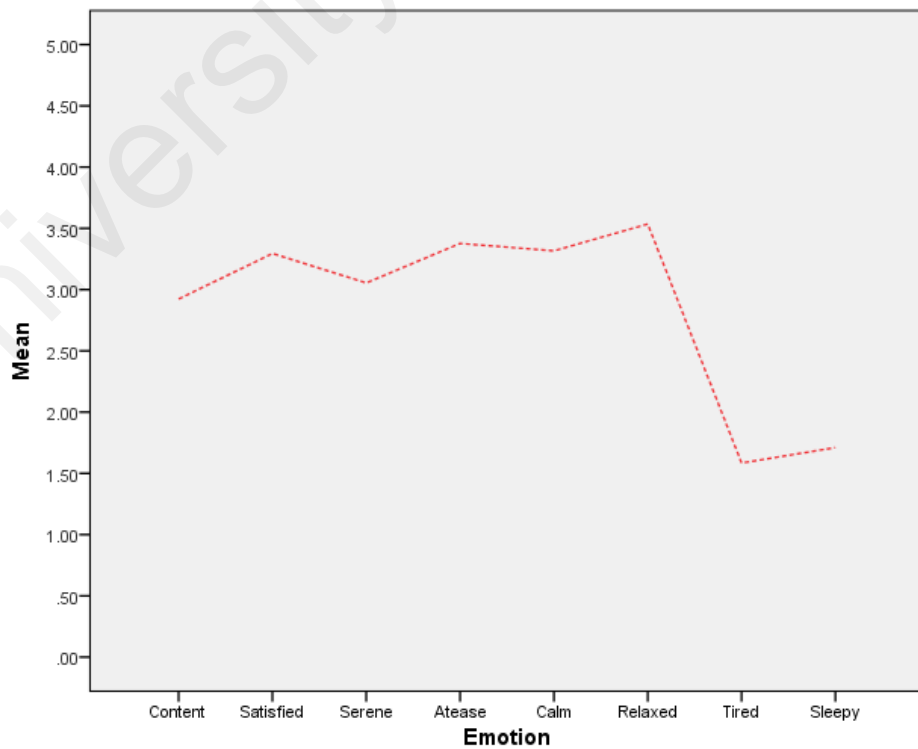


Figure 4.21 Classical music listening mean score for LA, PV emotion (non-musicians)

In sum, HA and PV emotion scored the highest average mean, with ‘delighted’ ranked at the top and ‘astonished’ ranked at the lowest. Followed by LA and PV emotion, with ‘relaxed’ ranked at the top and ‘tired’ ranked at the lowest. Third, LA and NV emotion, with ‘gloomy’ ranked at the top and ‘bored’ ranked at the lowest. Lastly, HA and NV emotion scored the lowest average mean, with ‘distressed’ ranked at the top and ‘angry’ ranked at the lowest.

4.3.2 Romantic Music

The following presents a discussion on four different quadrants of emotions: (1) high arousal (HA) and positive valence (PV); (2) high arousal (HA) and negative valence (NV); (3) low arousal (LA) and negative valence (NV); and (4) low arousal (LA) and positive valence (PV) when undergraduate non-music major students listen to romantic music.

4.3.2.1 High Arousal (HA) and Positive Valence (PV) emotion

Table 4.22 below displays the descriptive statistics of romantic music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and positive valence (PV) when the non-musicians listen to romantic music are ranked as: (1) astonished (2.95); (2) excited (2.60); (3) excited (2.60); (4) pleased (2.51); (5) delighted (2.43) (6) glad (2.43); (7) happy (2.35), with ‘astonished’ ranked at the top and ‘happy’ ranked at the lowest; and ‘delighted’ and ‘glad’ sharing a same mean score (2.43). The mean score of seven HA and PV emotion are 2.56 and ranged from 2.35 (*Happy*) to 2.95 (*Astonished*).

Table 4.22

Means, standard deviations, median and ranking for HA, PV emotion in non-musicians' Romantic music listening

Romantic Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Astonished	2.95	1.31	1.00	5.00	3.00	1
Excited	2.60	1.28	1.00	5.00	2.00	3
Amused	2.62	1.23	1.00	5.00	2.00	2
Happy	2.35	1.11	1.00	5.00	2.00	7
Delighted	2.43	1.19	1.00	5.00	2.00	5
Glad	2.43	1.21	1.00	5.00	2.00	6
Pleased	2.51	1.22	1.00	5.00	2.00	4
Average	2.56					

4.3.2.2 High Arousal (HA) and Negative Valence (NV) emotion

Table 4.23 below displays the descriptive statistics of romantic music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and negative valence (NV) when the non-musicians listen to romantic music are ranked as: (1) tense (2.57); (2) frustrated (2.35); (3) alarmed (2.33); (4) distressed (2.33); (5) annoyed (2.22); (6) afraid (2.19); (7) angry (1.96), with 'tense' ranked at the top and 'angry' ranked at the lowest; and 'alarmed' and 'distressed' sharing a same mean score (2.33). The mean score of seven HA and NV emotion are 2.28 and ranged from 1.96 (*Angry*) to 2.57 (*Tense*).

Table 4.23

Means, standard deviations, median and ranking for HA, NV emotion in non-musicians' Romantic music listening

Romantic Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Afraid	2.19	1.24	1.00	5.00	2.00	6
Alarmed	2.33	1.37	1.00	5.00	2.00	3
Angry	1.96	1.19	1.00	5.00	2.00	7
Tense	2.57	1.48	1.00	5.00	2.00	1
Frustrated	2.35	1.43	1.00	5.00	2.00	2
Annoyed	2.22	1.39	1.00	5.00	2.00	5
Distressed	2.33	1.31	1.00	5.00	2.00	4
Average	2.28					

4.3.2.3 Low Arousal (LA) and Negative Valence (NV) emotion

Table 4.24 below displays the descriptive statistics of romantic music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and negative valence (NV) when the non-musicians listen to romantic music are ranked as: (1) miserable (2.49); (2) gloomy (2.48); (3) sad (2.42); (4) depressed (2.38); (5) droopy (2.14); (6) bored (1.90), with 'sad' ranked at the top and 'bored' ranked at the lowest. The mean score of six LA and NV emotion are 2.30 and ranged from 1.90 (*Bored*) to 2.49 (*Miserable*).

Table 4.24

Means, standard deviations, median and ranking for LA, NV emotion in non-musicians' Romantic music listening

Romantic Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Miserable	2.49	1.38	1.00	5.00	2.00	1
Sad	2.42	1.34	1.00	5.00	2.00	3
Depressed	2.38	1.35	1.00	5.00	2.00	4
Gloomy	2.48	1.34	1.00	5.00	2.00	2
Bored	1.90	1.12	1.00	5.00	2.00	6
Droopy	2.14	1.16	1.00	5.00	2.00	5
Average	2.30					

4.3.2.4 Low Arousal (LA) and Positive Valence (PV) emotion

Table 4.25 below displays the descriptive statistics of romantic music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and positive valence (PV) when the non-musicians listen to romantic music are ranked as: (1) content (2.75); (2) satisfied (2.68); (3) serene (2.53); (4) at ease (2.52); (5) calm (2.50); (6) relaxed (2.48); (7) tired (2.09); (8) sleepy (1.95), with 'satisfied' ranked at the top and 'sleepy' ranked at the lowest. The mean score of eight LA and NV emotion are 2.44 and ranged from 1.95 (*Sleepy*) to 2.75 (*Content*).

Table 4.25

Means, standard deviations, median and ranking for LA, PV emotion in non-musicians' Romantic music listening

Romantic Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Content	2.75	1.29	1.00	5.00	3.00	1
Satisfied	2.68	1.27	1.00	5.00	3.00	2
Serene	2.53	1.30	1.00	5.00	2.00	3
At ease	2.52	1.30	1.00	5.00	2.00	4
Calm	2.50	1.35	1.00	5.00	2.00	5
Relaxed	2.48	1.36	1.00	5.00	2.00	6
Tired	2.09	1.23	1.00	5.00	2.00	7
Sleepy	1.95	1.16	1.00	5.00	2.00	8
Average	2.44					

4.3.2.5 Summary result of romantic music listening based on Circumplex Model of Emotion (non-musicians)

The Figure 4.22 to Figure 4.25 below illustrates the mean score of the 4 quadrant: (Fig. 4.22) high arousal (HA) and positive valence (PV); (Fig. 4.23) high arousal (HA) and negative valence (NV); (Fig. 4.24) low arousal (LA) and negative valence (NV); and (Fig. 4.25) low arousal (LA) and positive valence (PV). From the four figures, the four emotion quadrants are ranked as: (1) HA and PV emotion (2.56); (2) LA and PV emotion (2.44); (3) LA and NV emotion (2.30); (4) HA and NV emotion (2.28).

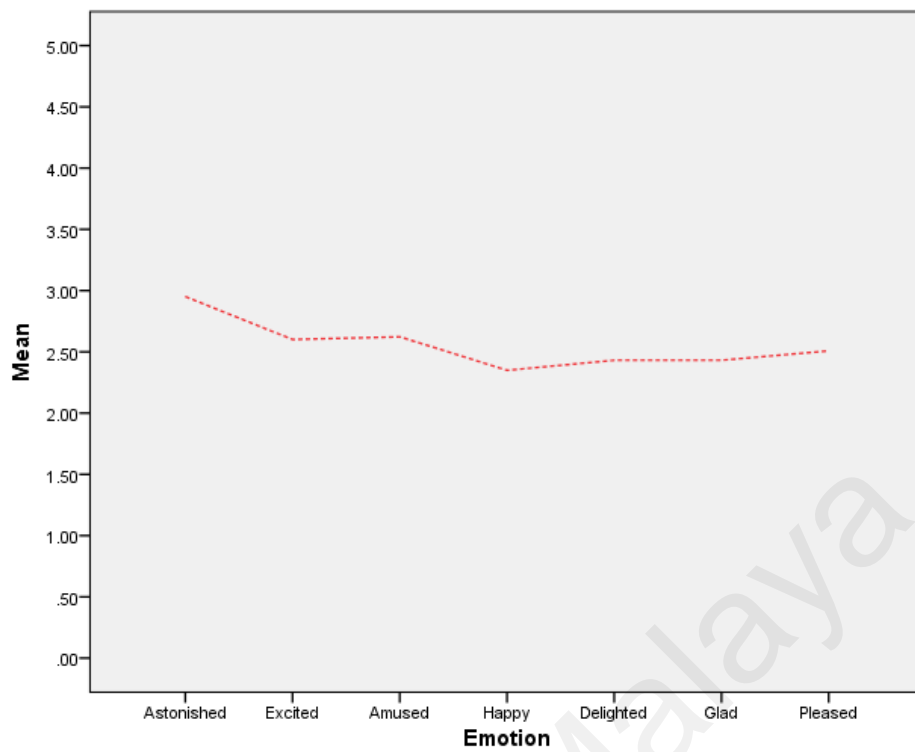


Figure 4.22 Romantic music listening mean score for HA, PV emotion (non-musicians)

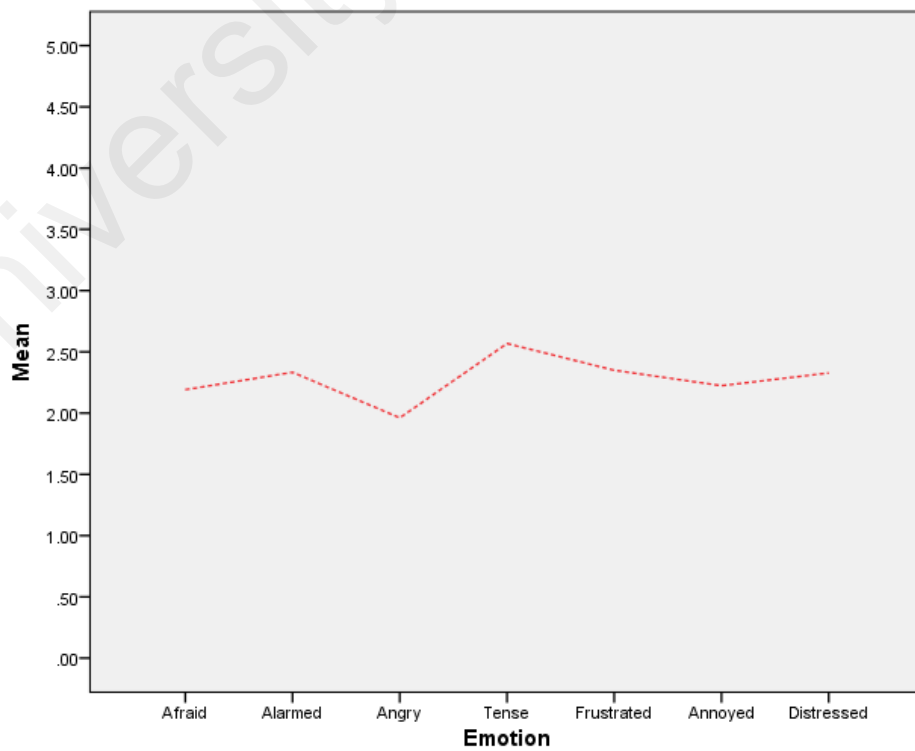


Figure 4.23 Romantic music listening mean score for HA, NV emotion (non-musicians)

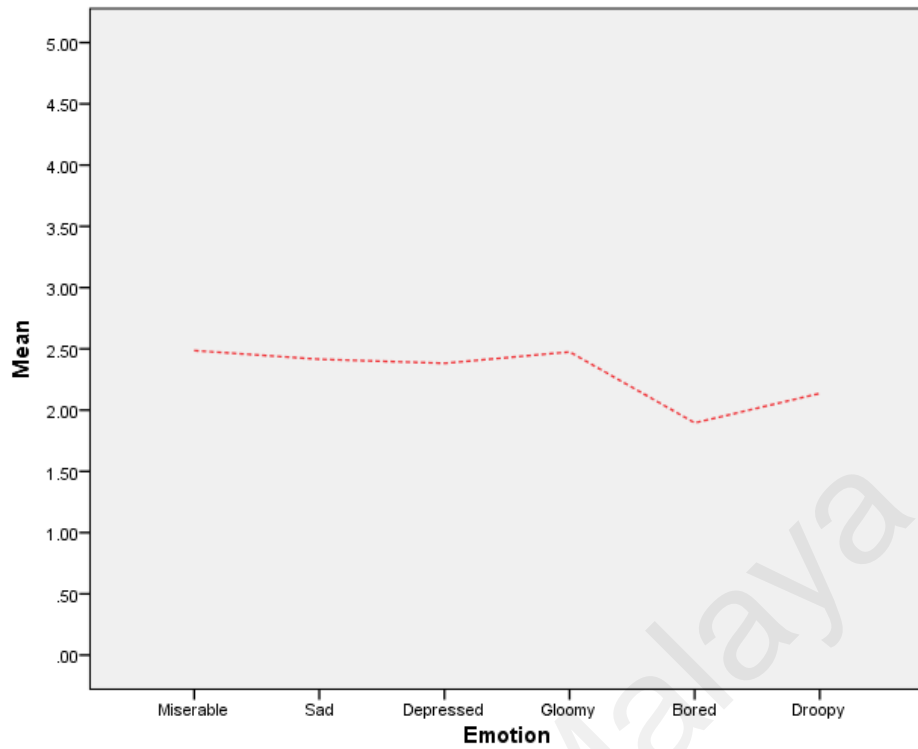


Figure 4.24 Romantic music listening mean score for LA, NV emotion (non-musicians)

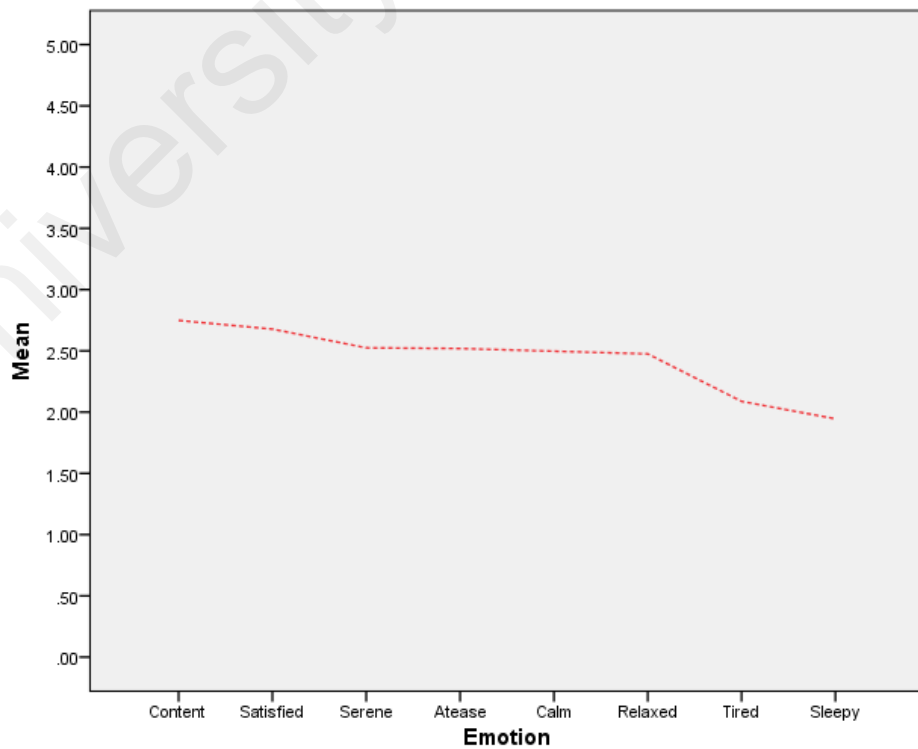


Figure 4.25 Romantic music listening mean score for LA, PV emotion (non-musicians)

In sum, HA and PV emotion scored the highest average mean, with ‘astonished’ ranked at the top and ‘happy’ ranked at the lowest. Followed by LA and PV emotion, with ‘satisfied’ ranked at the top and ‘sleepy’ ranked at the lowest. Third, LA and NV emotion, with ‘sad’ ranked at the top and ‘bored’ ranked at the lowest. Lastly, HA and NV emotion scored the lowest average mean, with ‘tense’ ranked at the top and ‘angry’ ranked at the lowest.

4.3.3 Atonal Music

The following presents a discussion on four different quadrants of emotions: (1) high arousal (HA) and positive valence (PV); (2) high arousal (HA) and negative valence (NV); (3) low arousal (LA) and negative valence (NV); and (4) low arousal (LA) and positive valence (PV) when undergraduate non-music major students listen to atonal music.

4.3.3.1 High Arousal (HA) and Positive Valence (PV) emotion

Table 4.26 below displays the descriptive statistics of atonal music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and positive valence (PV) when the non-musicians listen to atonal music are ranked as: (1) astonished (2.63); (2) excited (2.21); (3) amused (2.19); (4) glad (2.09); (5) delighted (2.07); (6) pleased (2.07); (7) happy (2.02), with ‘astonished’ ranked at the top and ‘glad’ ranked at the lowest; and ‘delighted’ and ‘pleased’ sharing a same mean score (2.07). The mean score of seven HA and PV emotion are 2.18 and ranged from 2.02 (*Happy*) to 2.63 (*Astonished*).

Table 4.26

Means, standard deviations, median and ranking for HA, PV emotion in non-musicians' Atonal music listening

Atonal Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Astonished	2.63	1.24	1.00	5.00	2.00	1
Excited	2.21	1.08	1.00	5.00	2.00	2
Amused	2.19	1.06	1.00	5.00	2.00	3
Happy	2.02	.96	1.00	5.00	2.00	7
Delighted	2.07	1.03	1.00	5.00	2.00	5
Glad	2.09	1.03	1.00	5.00	2.00	4
Pleased	2.07	1.00	1.00	5.00	2.00	6
Average	2.18					

4.3.3.2 High arousal (HA) and Negative valence (NV) emotion

Table 4.27 below displays the descriptive statistics of atonal music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and negative valence (NV) when the non-musicians listen to atonal music are ranked as: (1) annoyed (2.88); (2) tense (2.79); (3) frustrated (2.79); (4) alarmed (2.60); (5) distressed (2.39); (6) afraid (2.32); (7) angry (2.07), with 'annoyed' ranked at the top and 'angry' ranked at the lowest; and 'tense' and 'frustrated' sharing a same mean score (2.79). The mean score of seven HA and NV emotion are 2.55 and ranged from 2.07 (*Angry*) to 2.88 (*Annoyed*).

Table 4.27

Means, standard deviations, median and ranking for HA, NV emotion in non-musicians' Atonal music listening

Atonal Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Afraid	2.32	1.27	1.00	5.00	2.00	6
Alarmed	2.60	1.39	1.00	5.00	2.00	4
Angry	2.07	1.15	1.00	5.00	2.00	7
Tense	2.79	1.43	1.00	5.00	3.00	2
Frustrated	2.79	1.45	1.00	5.00	2.00	3
Annoyed	2.88	1.46	1.00	5.00	3.00	1
Distressed	2.39	1.36	1.00	5.00	2.00	5
Average	2.55					

4.3.3.3 Low arousal (LA) and Negative valence (NV) emotion

Table 4.28 below displays the descriptive statistics of atonal music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and negative valence (NV) when the non-musicians listen to atonal music are ranked as: (1) miserable (2.56); (2) bored (2.55); (3) gloomy (2.46); (4) droopy (2.41); (5) depressed (2.37); (6) sad (2.09), with 'miserable' ranked at the top and 'sad' ranked at the lowest. The mean score of six LA and NV emotion are 2.41 and ranged from 2.09 (*Sad*) to 2.56 (*Miserable*).

Table 4.28

Means, standard deviations, median and ranking for LA, NV emotion in non-musicians' Atonal music listening

Atonal Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Miserable	2.56	1.37	1.00	5.00	2.00	1
Sad	2.09	1.14	1.00	5.00	2.00	6
Depressed	2.37	1.26	1.00	5.00	2.00	5
Gloomy	2.46	1.29	1.00	5.00	2.00	3
Bored	2.55	1.44	1.00	5.00	2.00	2
Droopy	2.41	1.31	1.00	5.00	2.00	4
Average	2.41					

4.3.3.4 Low Arousal (LA) and Positive Valence (PV) emotion

Table 4.29 below displays the descriptive statistics of atonal music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and positive valence (PV) when the non-musicians listen to atonal music are ranked as: (1) tired (2.59); (2) sleepy (2.52); (3) content (2.18); (4) satisfied (2.09); (5) serene (1.97); (6) calm (1.95); (7) at ease (1.93); (8) relaxed (1.91), with 'tired' ranked at the top and 'relaxed' ranked at the lowest. The mean score of eight LA and NV emotion are 2.14 and ranged from 1.91 (*Relaxed*) to 2.59 (*Tired*).

Table 4.29

A Means, standard deviations, median and ranking for LA, PV emotion in non-musicians' Atonal music listening

Atonal Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Content	2.18	1.04	1.00	5.00	2.00	3
Satisfied	2.09	1.05	1.00	5.00	2.00	4
Serene	1.97	1.03	1.00	5.00	2.00	5
At ease	1.93	1.01	1.00	5.00	2.00	7
Calm	1.95	1.05	1.00	5.00	2.00	6
Relaxed	1.91	.99	1.00	5.00	2.00	8
Tired	2.59	1.40	1.00	5.00	2.00	1
Sleepy	2.52	1.43	1.00	5.00	2.00	2
Average	2.14					

4.3.3.5 Summary result of atonal music listening based on Circumplex Model of Emotion (non-musicians)

The Figure 4.26 to Figure 4.29 below illustrates the mean score of the 4 quadrant: (Fig. 4.26) high arousal (HA) and positive valence (PV); (Fig. 4.27) high arousal (HA) and negative valence (NV); (Fig. 4.28) low arousal (LA) and negative valence (NV); and (Fig. 4.29) low arousal (LA) and positive valence (PV). From the four figures, the four emotion quadrants are ranked as: (1) HA and NV emotion (2.55); (2) LA and NV emotion (2.41); (3) HA and PV emotion (2.18); (4) LA and PV emotion (2.14).

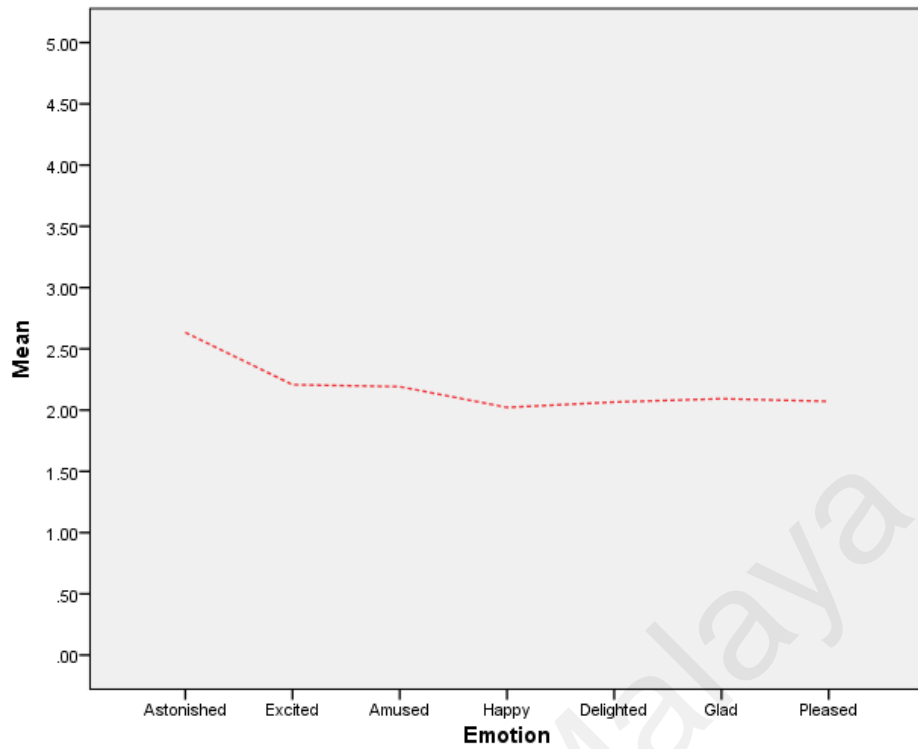


Figure 4.26 Atonal music listening mean score for HA, PV emotion (non-musicians)

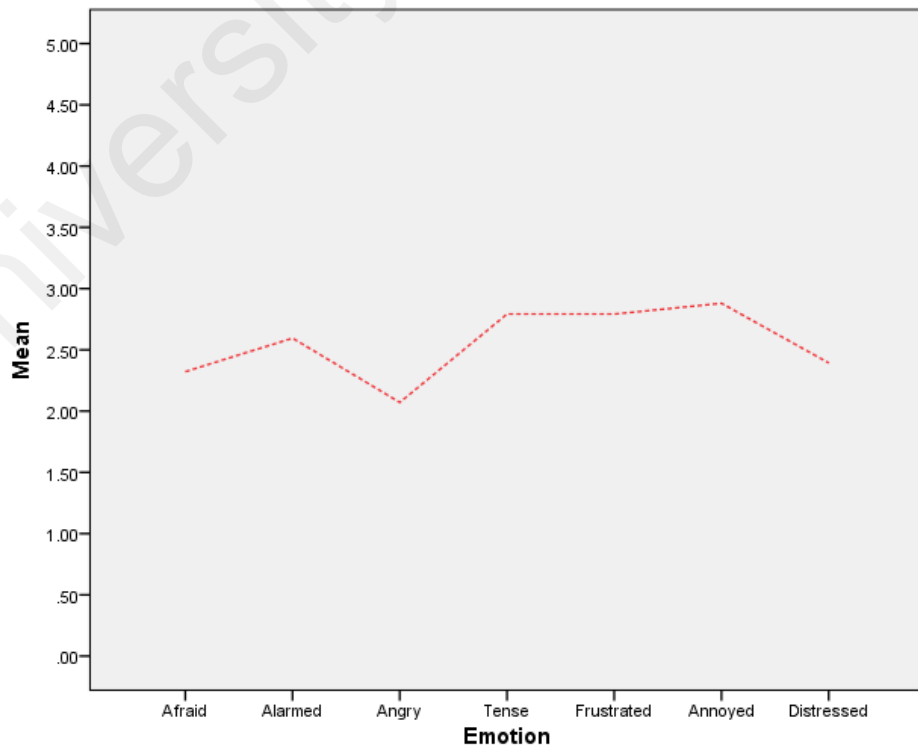


Figure 4.27 Atonal music listening mean score for HA, NV emotion (non-musicians)

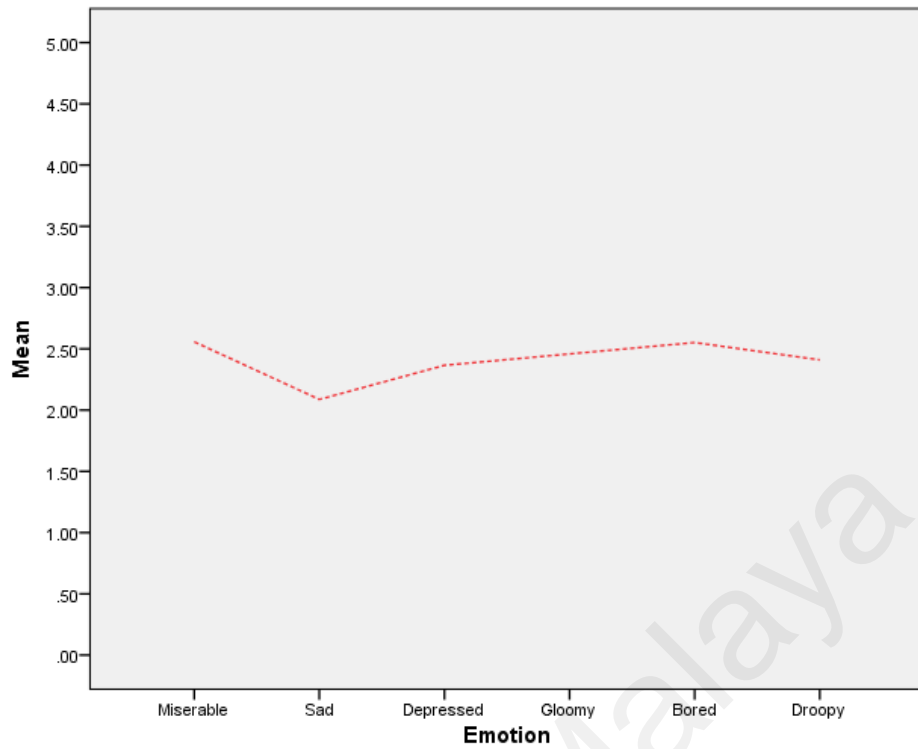


Figure 4.28 Atonal music listening mean score for LA, NV emotion (non-musicians)

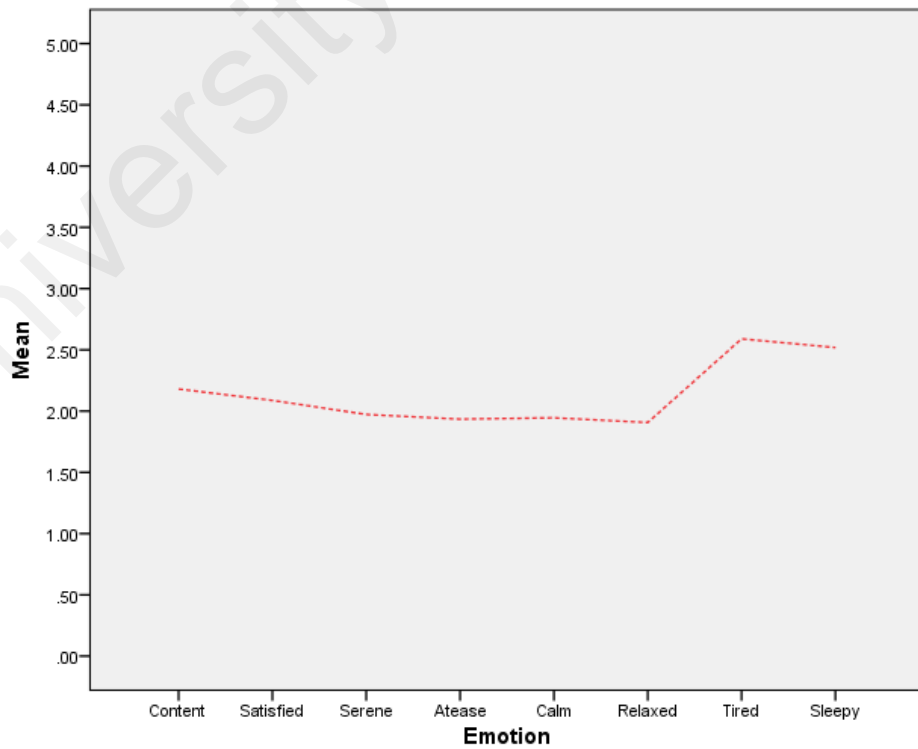


Figure 4.29 Atonal music listening mean score for LA, PV emotion (non-musicians)

In sum, HA and NV emotion scored the highest average mean, with ‘annoyed’ ranked at the top and ‘angry’ ranked at the lowest. Followed by LA and NV emotion, with ‘miserable’ ranked at the top and ‘sad’ ranked at the lowest. Third, HA and PV emotion, with ‘astonished’ ranked at the top and ‘glad’ ranked at the lowest. Lastly, LA and PV emotion scored the lowest average mean, with ‘tired’ ranked at the top and ‘relaxed’ ranked at the lowest.

4.3.4 Experimental Music

The following presents a discussion on four different quadrants of emotions: (1) high arousal (HA) and positive valence (PV); (2) high arousal (HA) and negative valence (NV); (3) low arousal (LA) and negative valence (NV); and (4) low arousal (LA) and positive valence (PV) when undergraduate non-music major students listen to experimental music.

4.3.4.1 High Arousal (HA) and Positive Valence (PV) emotion

Table 4.30 below displays the descriptive statistics of experimental music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and positive valence (PV) when the non-musicians listen to experimental music are ranked as: (1) astonished (2.62); (2) excited (2.20); (3) amused (2.07); (4) happy (1.81); (5) delighted (1.81); (6) glad (1.79); (7) pleased (1.79), with ‘astonished’ ranked at the top and ‘glad, pleased’ ranked at the lowest; and ‘happy’ and ‘delighted’ (1.81), and ‘glad’ and ‘pleased’ (1.79) sharing a same mean score. The mean score of seven HA and PV emotion are 2.01 and ranged from 1.79 (*Glad, Pleased*) to 2.62 (*Astonished*).

Table 4.30

Means, standard deviations, median and ranking for HA, PV emotion in non-musicians' Experimental music listening

Experimental Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Astonished	2.62	1.30	1.00	5.00	2.00	1
Excited	2.20	1.21	1.00	5.00	2.00	2
Amused	2.07	1.10	1.00	5.00	2.00	3
Happy	1.81	.94	1.00	5.00	2.00	4
Delighted	1.81	.95	1.00	5.00	2.00	5
Glad	1.79	.94	1.00	5.00	2.00	6
Pleased	1.79	.90	1.00	5.00	2.00	7
Average	2.01					

4.3.4.2 High Arousal (HA) and Negative Valence (NV) emotion

Table 4.31 below displays the descriptive statistics of experimental music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in high arousal (HA) and negative valence (NV) when the non-musicians listen to experimental music are ranked as: (1) annoyed (3.65); (2) frustrated (3.53); (3) tense (3.46); (4) alarmed (3.25); (5) angry (2.90); (6) distressed (2.88); (7) afraid (2.71), with 'annoyed' ranked at the top and 'afraid' ranked at the lowest. The mean score of seven HA and NV emotion are 3.20 and ranged from 2.71 (*Afraid*) to 3.65 (*Annoyed*).

Table 4.31

Means, standard deviations, median and ranking for HA, NV emotion in non-musicians' Experimental music listening

Experimental Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Afraid	2.71	1.34	1.00	5.00	2.00	7
Alarmed	3.25	1.39	1.00	5.00	4.00	4
Angry	2.90	1.44	1.00	5.00	3.00	5
Tense	3.46	1.39	1.00	5.00	4.00	3
Frustrated	3.53	1.40	1.00	5.00	4.00	2
Annoyed	3.65	1.37	1.00	5.00	4.00	1
Distressed	2.88	1.47	1.00	5.00	3.00	6
Average	3.20					

4.3.4.3 Low Arousal (LA) and Negative Valence (NV) emotion

Table 4.32 below displays the descriptive statistics of experimental music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and negative valence (NV) when the non-musicians listen to experimental music are ranked as: (1) miserable (2.88); (2) bored (2.80); (3) depressed (2.63); (4) droopy (2.50); (5) gloomy (2.44); (6) sad (2.13), with 'miserable' ranked at the top and 'sad' ranked at the lowest. The mean score of six LA and NV emotion are 2.56 and ranged from 2.13 (*Sad*) to 2.88 (*Miserable*).

Table 4.32

Means, standard deviations, median and ranking for LA, NV emotion in non-musicians' Experimental music listening

Experimental Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Miserable	2.88	1.46	1.00	5.00	3.00	1
Sad	2.13	1.14	1.00	5.00	2.00	6
Depressed	2.63	1.43	1.00	5.00	2.00	3
Gloomy	2.44	1.26	1.00	5.00	2.00	5
Bored	2.80	1.40	1.00	5.00	3.00	2
Droopy	2.50	1.33	1.00	5.00	2.00	4
Average	2.56					

4.3.4.4 Low Arousal (LA) and Positive Valence (PV) emotion

Table 4.33 below displays the descriptive statistics of experimental music listening which includes the mean scores, standard deviation (SD), minimum and maximum, median and ranking. The emotional variables in low arousal (LA) and positive valence (PV) when the non-musicians listen to experimental music are ranked as: (1) tired (2.49); (2) content (2.18); (3) sleepy (2.16); (4) satisfied (1.85); (5) serene (1.67); (6) at ease (1.66); (7) calm (1.59); (8) relaxed (1.58), with 'tired' ranked at the top and 'relaxed' ranked at the lowest. The mean score of eight LA and NV emotion are 1.90 and ranged from 1.58 (*Relaxed*) to 2.49 (*Tired*).

Table 4.33

Means, standard deviations, median and ranking for LA, PV emotion in non-musicians' Experimental music listening

Experimental Music Listening						
Variables	Mean	SD	Minimum	Maximum	Median	Ranking
Content	2.18	1.12	1.00	5.00	2.00	2
Satisfied	1.85	.99	1.00	5.00	2.00	4
Serene	1.67	.89	1.00	5.00	1.00	5
At ease	1.66	.91	1.00	5.00	1.00	6
Calm	1.59	.87	1.00	5.00	1.00	7
Relaxed	1.58	.85	1.00	5.00	1.00	8
Tired	2.49	1.44	1.00	5.00	2.00	1
Sleepy	2.16	1.31	1.00	5.00	2.00	3
Average	1.90					

4.3.4.5 Summary result of experimental music listening based on Circumplex Model of Emotion (non-musicians)

The Figure 4.30 to Figure 4.33 below illustrates the mean score of the 4 quadrant: (Fig. 4.30) high arousal (HA) and positive valence (PV); (Fig. 4.31) high arousal (HA) and negative valence (NV); (Fig. 4.32) low arousal (LA) and negative valence (NV); and (Fig. 4.33) low arousal (LA) and positive valence (PV). From the four figures, the four emotion quadrants are ranked as: (1) HA and NV emotion (3.20); (2) LA and NV emotion (2.56); (3) HA and PV emotion (2.01); (4) LA and PV emotion (1.90).

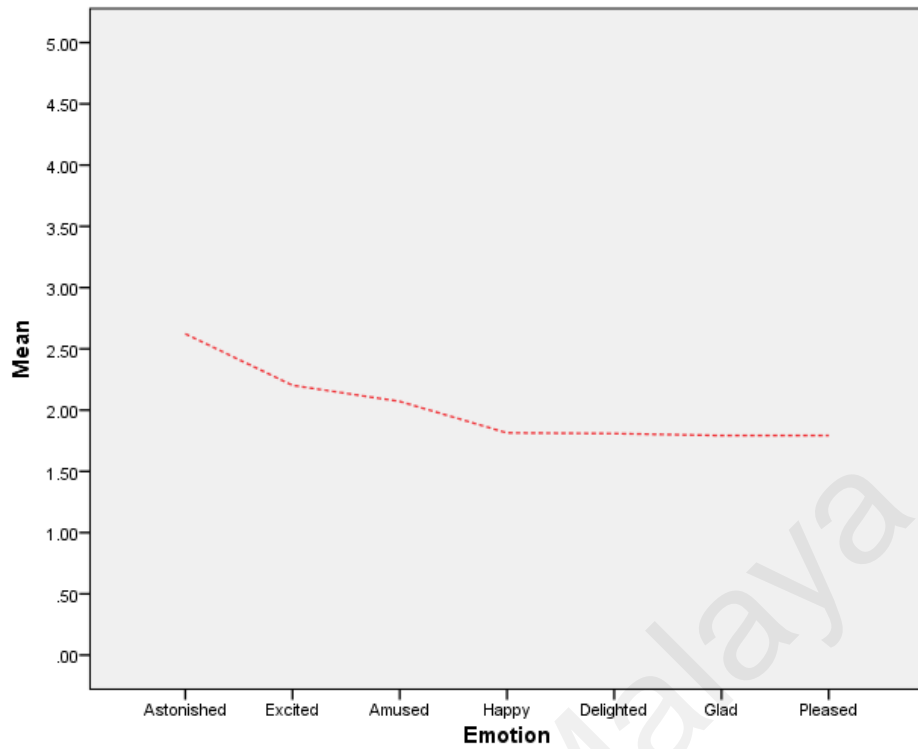


Figure 4.30 Experimental music listening mean score for HA, PV emotion (non-musicians)

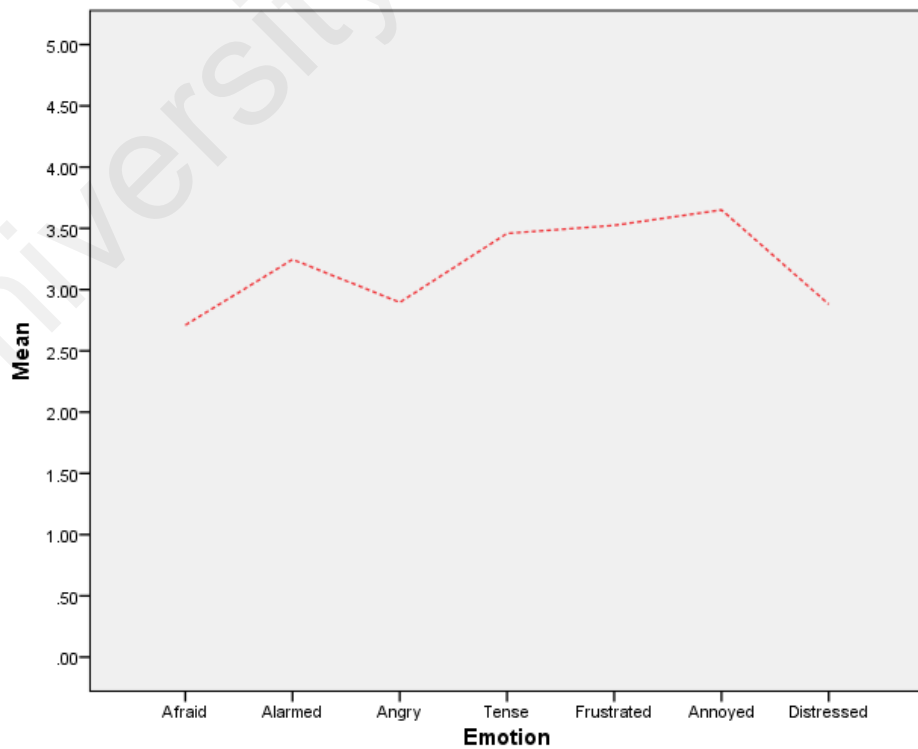


Figure 4.31 Experimental music listening mean score for HA, NV emotion (non-musicians)

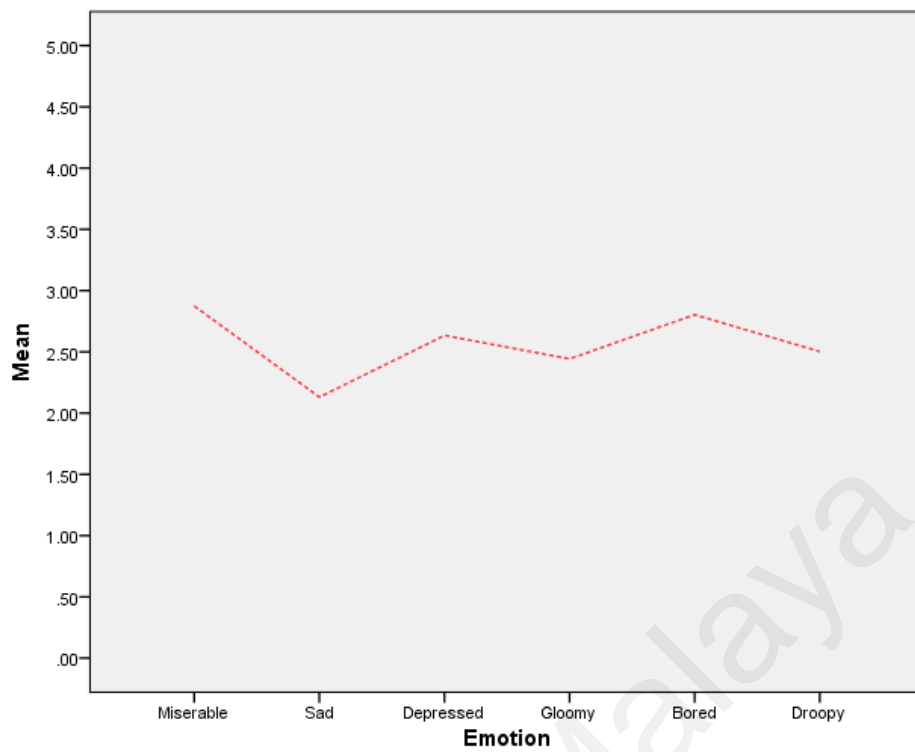


Figure 4.32 Experimental music listening mean score for LA, NV emotion (non-musicians)

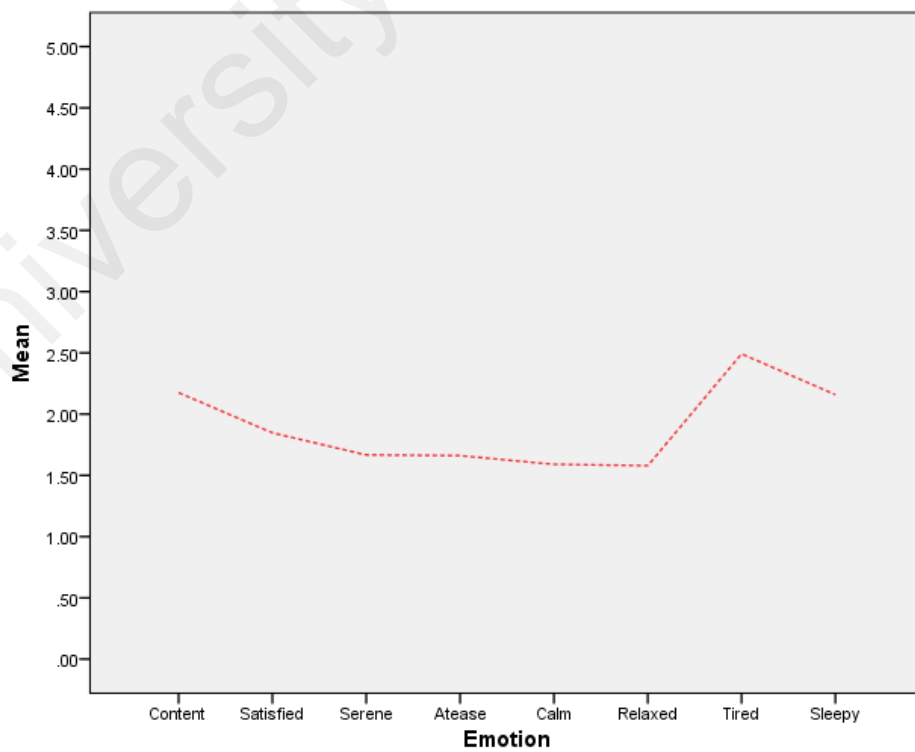


Figure 4.33 Experimental music listening mean score for LA, PV emotion (non-musicians)

In sum, HA and NV emotion scored the highest average mean, with ‘annoyed’ ranked at the top and ‘afraid’ ranked at the lowest. Followed by LA and NV emotion, with ‘miserable’ ranked at the top and ‘sad’ ranked at the lowest. Third, HA and PV emotion, with ‘astonished’ ranked at the top and ‘glad, pleased’ ranked at the lowest. Lastly, LA and PV emotion scored the lowest average mean, with ‘tired’ ranked at the top and ‘relaxed’ ranked at the lowest.

4.3.5 Summary of results on non-musicians’ listening to four different music genres

Table 4.34 below displays the summary result on mean scores for four different quadrants in Russell’s Circumplex Model of Emotion with four different music genres variable. In conclusion, the emotion quadrant that best described non-musicians when they listen to four different music genres are as: (1) classical music – HA and PV emotion (3.36); (2) romantic music – HA and PV emotion (2.56); (3) atonal music – HA and NV emotion (2.55); (4) experimental music – HA and NV emotion (3.20).

Table 4.34

Means for 4 quadrants of emotion when non-musicians’ listening to four different music genres

Variables	HA, PV	HA, NV	LA, NV	LA, PV
Classical Music	3.36	1.49	1.63	2.85
Romantic Music	2.56	2.28	2.30	2.44
Atonal Music	2.18	2.55	2.41	2.14
Experimental Music	2.01	3.20	2.56	1.90

The Figure 4.34 below illustrates the mean score of the 4 quadrants. From the figure, HA and PV emotion are ranked as: (1) classical music; (2) romantic music; (3) atonal music; (4) experimental music. HA and NV emotion are ranked as: (1) experimental music; (2) atonal music; (3) romantic music; (4) classical music. LA and NV emotion are ranked as: (1) experimental music; (2) romantic music; (3) atonal music; (4) classical music. LA and PV emotion are ranked as: (1) classical music; (2) romantic music; (3) atonal music; (4) experimental music.

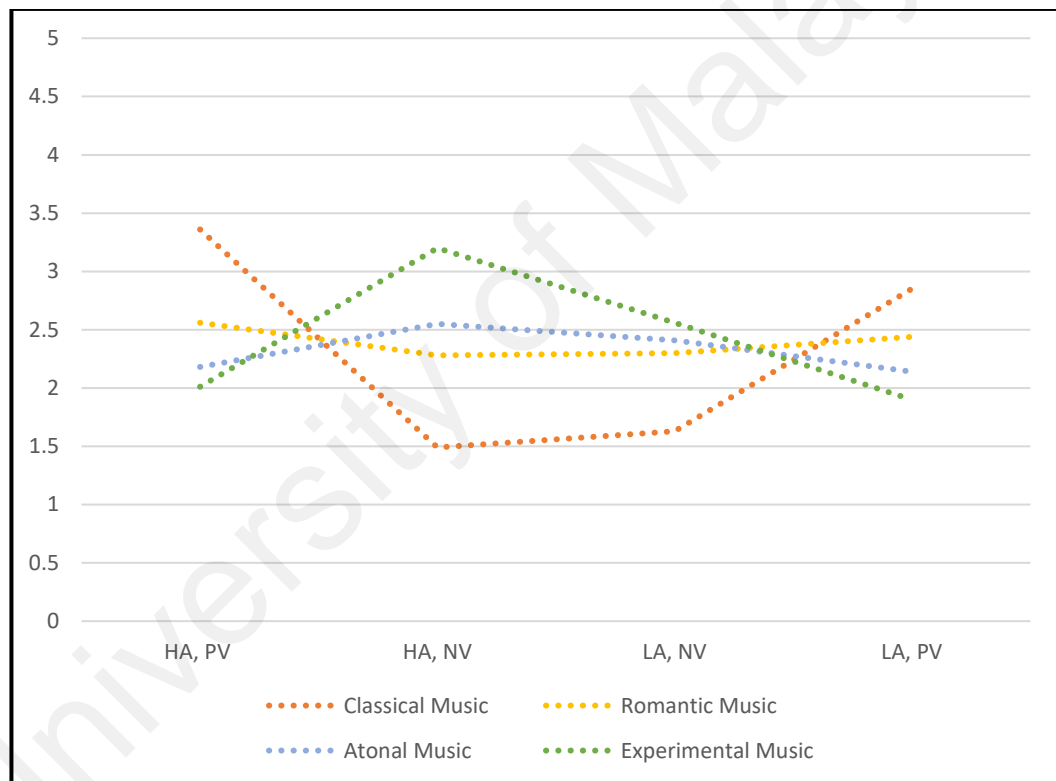


Figure 4.34 Mean score for 4 quadrants of emotion when non-musicians listening to four different music genres

4.4 Differences in the ranges of Affective Responses between Undergraduate Music Major and Non-music Major Students

To address research question 3, an analysis of mean difference was generated. The result was categorised in four different music genres to make a comparison between undergraduate music major students and undergraduate non-music major students, in four quadrants of emotions in Russell's Circumplex of Emotion, as shown in tables and figures below.

4.4.1 Classical Music

The following presents a discussion on four different quadrants of emotions: (1) high arousal (HA) and positive valence (PV); (2) high arousal (HA) and negative valence (NV); (3) low arousal (LA) and negative valence (NV); and (4) low arousal (LA) and positive valence (PV) between undergraduate music major students and undergraduate non-music major students listen to classical music.

4.4.1.1 High Arousal (HA) and Positive Valence (PV) emotion

Table 4.35 below displays the descriptive statistics of classical music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking. The mean difference on emotional variables in high arousal (HA) and positive valence (PV) when the musicians and non-musicians listen to classical music are ranked as: (1) excited (0.10); (2) astonished (0.02); (3) glad (-0.04); (4) delighted (-0.04); (5) pleased (-0.06); (6) happy (-0.15); (7) amused (-0.22), with 'excited' ranked at the top as the largest difference and 'amused' ranked at the lowest as the least difference. The mean difference of seven HA and PV emotion between musicians and non-musicians' emotion are ranged from -0.22 (Amused) to 0.10 (*Excited*).

Table 4.35

Means, mean difference and ranking for HA, PV emotion in musicians and non-musicians' Classical music listening

Classical Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Astonished	2.86	2.84	0.02	2
Excited	3.22	3.12	0.10	1
Amused	3.02	3.24	-0.22	7
Happy	3.46	3.61	-0.15	6
Delighted	3.58	3.64	-0.06	4
Glad	3.47	3.51	-0.04	3
Pleased	3.48	3.56	-0.08	5

Note: MD = Mean Difference

4.4.1.2 High Arousal (HA) and Negative Valence (NV) emotion

Table 4.36 below displays the descriptive statistics of classical music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking. The mean difference on emotional variables in high arousal (HA) and negative valence (NV) when the musicians and non-musicians listen to classical music are ranked as: (1) annoyed (0.35); (2) angry (0.33); (3) frustrated (0.31); (4) afraid (0.30); (5) tense (0.25); (6) alarmed (0.23); (7) distressed (0.11), with 'annoyed' ranked at the top as the largest difference and 'distressed' ranked at the lowest as the least difference. The mean difference of seven HA and NV emotion between musicians and non-musicians' emotion are ranged from 0.11 (*Distressed*) to 0.35 (*Annoyed*).

Table 4.36

Means, mean difference and ranking for HA, NV emotion in musicians and non-musicians' Classical music listening

Classical Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Afraid	1.75	1.45	0.30	4
Alarmed	1.80	1.57	0.23	6
Angry	1.60	1.27	0.33	2
Tense	1.78	1.53	0.25	5
Frustrated	1.72	1.41	0.31	3
Annoyed	1.69	1.34	0.35	1
Distressed	1.95	1.84	0.11	7

Note: MD = Mean Difference

4.4.1.3 Low Arousal (LA) and Negative Valence (NV) emotion

Table 4.37 below displays the descriptive statistics of classical music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking. The mean difference on emotional variables in low arousal (LA) and negative valence (NV) when the musicians and non-musicians listen to classical music are ranked as: (1) bored (0.37); (2) droopy (0.32); (3) depressed (0.29); (4) miserable (0.27); (5) gloomy (0.23); (6) sad (0.18), with 'bored' ranked at the top as the largest difference and 'sad' ranked at the lowest as the least difference. The mean difference of six LA and NV emotion between musicians and non-musicians' emotion are ranged from 0.18 (*Sad*) to 0.37 (*Bored*).

Table 4.37

Means, mean difference and ranking for LA, NV emotion in musicians and non-musicians' Classical music listening

Classical Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Miserable	1.91	1.64	0.27	4
Sad	1.87	1.69	0.18	6
Depressed	1.86	1.57	0.29	3
Gloomy	1.98	1.75	0.23	5
Bored	1.88	1.51	0.37	1
Droopy	1.93	1.61	0.32	2

Note: MD = Mean Difference

4.4.1.4 Low Arousal (LA) and Positive Valence (PV) emotion

Table 4.38 below displays the descriptive statistics of classical music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking. The mean difference on emotional variables in low arousal (LA) and positive valence (PV) when the musicians and non-musicians listen to classical music are ranked as: (1) tired (0.27); (2) sleepy (0.14); (3) serene (0.10); (4) content (0.06); (5) calm (0.04); (6) satisfied (0.01); (7) relaxed (-0.07); (8) at ease (-0.09), with 'tired' ranked at the top as the largest difference and 'at ease' ranked at the lowest as the least difference. The mean difference of eight LA and PV emotion between musicians and non-musicians' emotion are ranged from -0.09 (*At ease*) to 0.27 (*Tired*).

Table 4.38

Means, mean difference and ranking for LA, PV emotion in musicians and non-musicians' Classical music listening

Classical Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Content	2.98	2.92	0.06	4
Satisfied	3.31	3.30	0.01	6
Serene	3.16	3.06	0.10	3
At ease	3.29	3.38	-0.09	8
Calm	3.36	3.32	0.04	5
Relaxed	3.47	3.54	-0.07	7
Tired	1.86	1.59	0.27	1
Sleepy	1.85	1.71	0.14	2

Note: MD = Mean Difference

4.4.1.5 Summary of different ranges of affective responses between musicians and non-musicians in classical music listening

The Figure 4.35 to Figure 4.38 below illustrates the mean score of the 4 quadrant: (Fig. 4.35) high arousal (HA) and positive valence (PV); (Fig. 4.36) high arousal (HA) and negative valence (NV); (Fig. 4.37) low arousal (LA) and negative valence (NV); and (Fig. 4.38) low arousal (LA) and positive valence (PV).

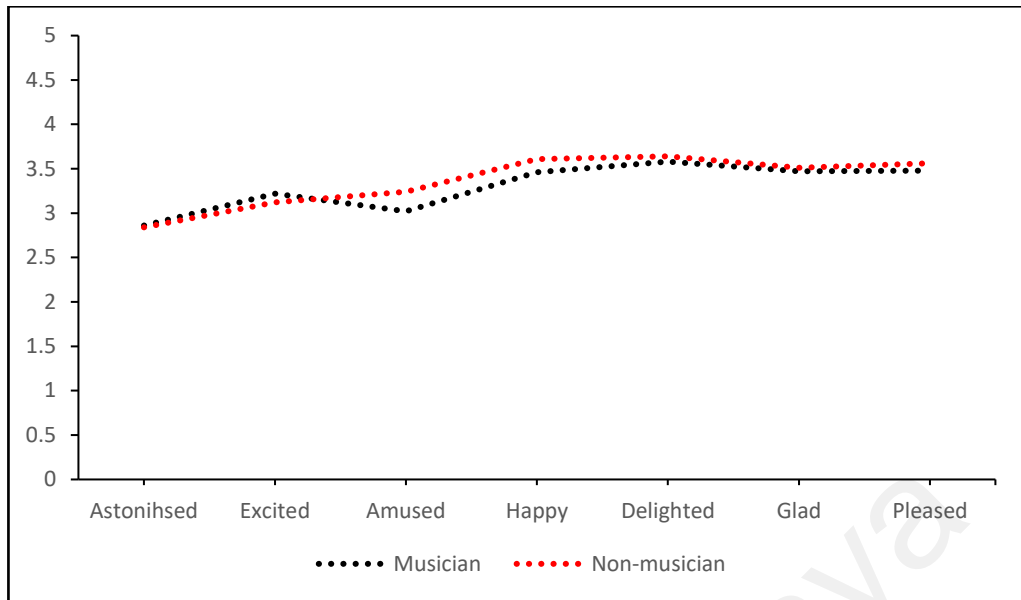


Figure 4.35 Classical music listening mean score for HA, PV emotion between musicians and non-musicians

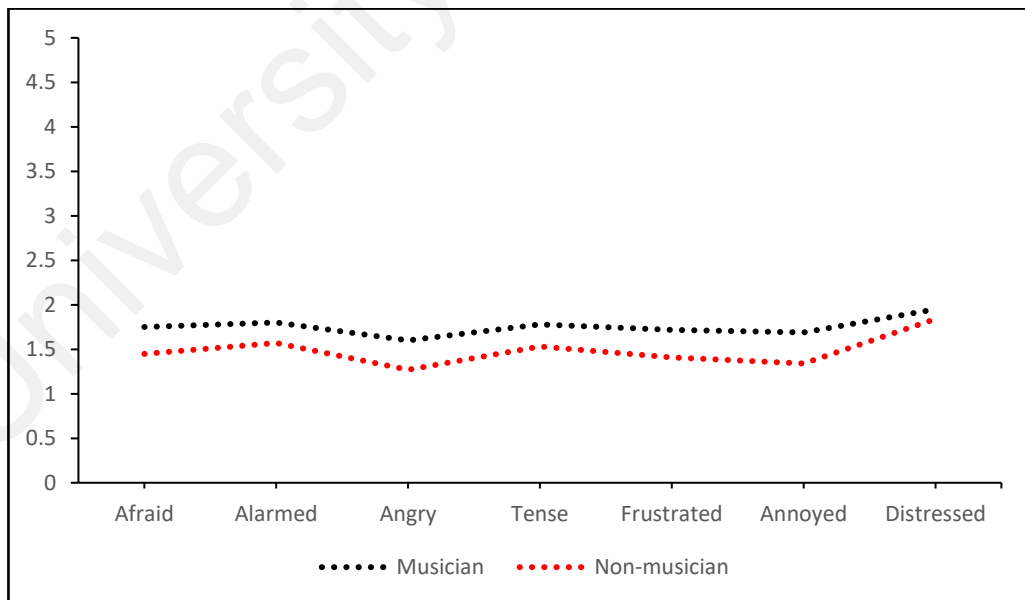


Figure 4.36 Classical music listening mean score for HA, NV emotion between musicians and non-musicians

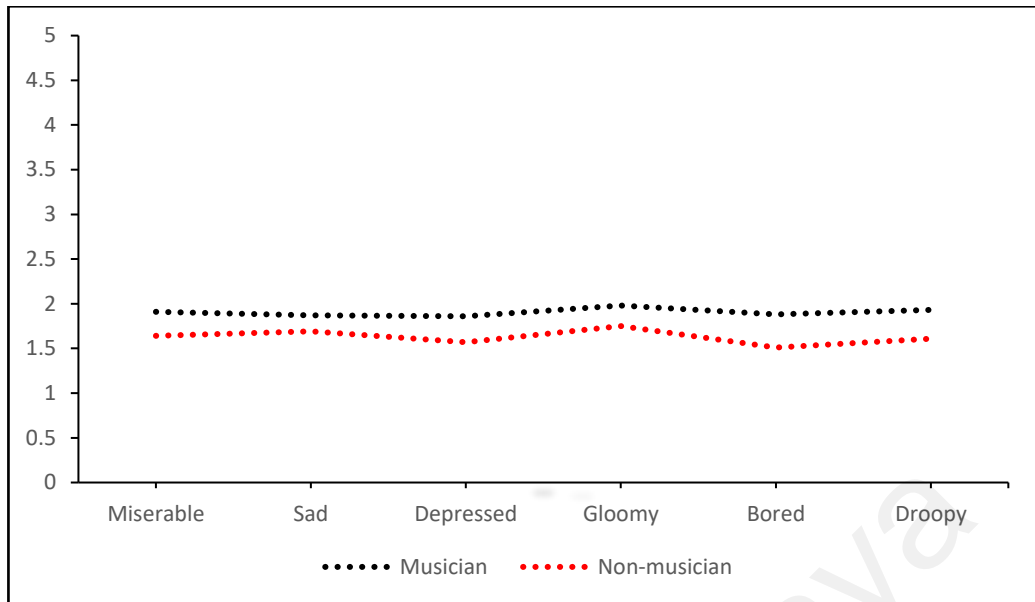


Figure 4.37 Classical music listening mean score for LA, NV emotion between musicians and non-musicians

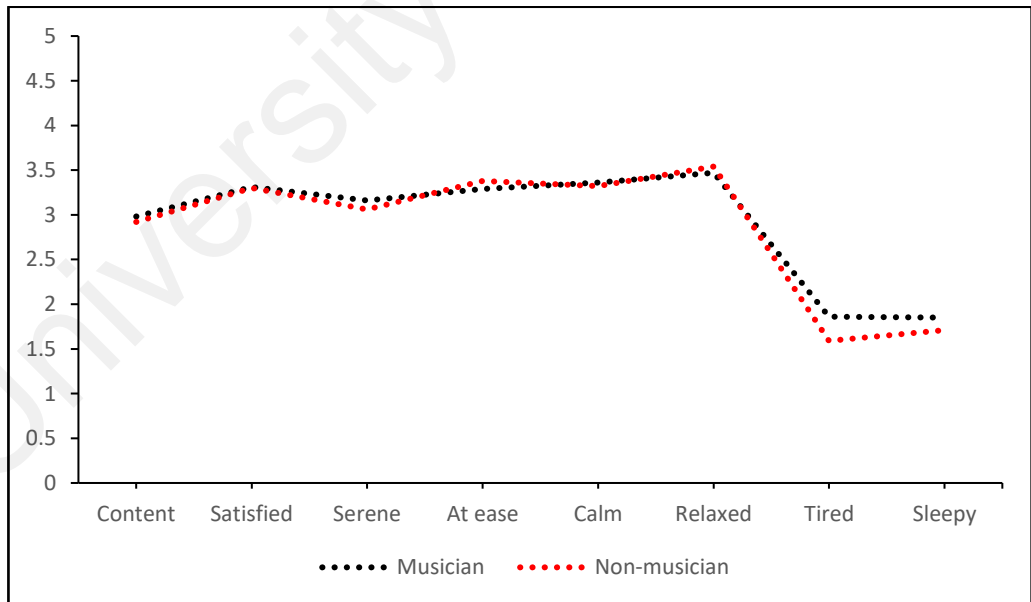


Figure 4.38 Classical music listening mean score for LA, PV emotion between musicians and non-musicians

In sum, LA and NV emotion had the largest mean difference, with ‘bored’ ranked at the top and ‘sad’ ranked at the lowest. Followed by HA and NV emotion, with ‘annoyed’ ranked at the top and ‘distressed’ ranked at the lowest. Third, LA and PV emotion, with ‘tired’ ranked at the top and ‘at ease’ ranked at the lowest. Lastly, HA and PV emotion had the least mean difference, with ‘excited’ ranked at the top and ‘amused’ ranked at the lowest.

4.4.2 Romantic Music

The following presents a discussion on four different quadrants of emotions: (1) high arousal (HA) and positive valence (PV); (2) high arousal (HA) and negative valence (NV); (3) low arousal (LA) and negative valence (NV); and (4) low arousal (LA) and positive valence (PV) between undergraduate music major students and undergraduate non-music major students listen to romantic music.

4.4.2.1 High Arousal (HA) and Positive Valence (PV) emotion

Table 4.39 below displays the descriptive statistics of romantic music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking. The mean difference on emotional variables in high arousal (HA) and positive valence (PV) when the musicians and non-musicians listen to romantic music are ranked as: (1) excited (0.31); (2) pleased (0.23); (3) amused (0.18); (4) glad (0.18); (5) delighted (0.15); (6) happy (0.13); (7) astonished (0.10), with ‘excited’ ranked at the top as the largest difference and ‘astonished’ ranked at the lowest as the least difference; and ‘amused’ and ‘glad’ sharing a same mean difference (0.18). The mean difference of seven HA and PV emotion between musicians and non-musicians’ emotion are ranged from 0.10 (*Astonished*) to 0.31 (*Excited*).

Table 4.39

Means, mean difference and ranking for HA, PV emotion in musicians and non-musicians' Romantic music listening

Romantic Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Astonished	3.05	2.95	0.10	7
Excited	2.91	2.60	0.31	1
Amused	2.80	2.62	0.18	3
Happy	2.48	2.35	0.13	6
Delighted	2.58	2.43	0.15	5
Glad	2.61	2.43	0.18	4
Pleased	2.74	2.51	0.23	2

Note: MD = Mean Difference

4.4.2.2 High Arousal (HA) and Negative Valence (NV) emotion

Table 4.40 below displays the descriptive statistics of romantic music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking.

The mean difference on emotional variables in high arousal (HA) and negative valence (NV) when the musicians and non-musicians listen to romantic music are ranked as: (1) angry (0.22); (2) distressed (0.21); (3) tense (0.18); (4) alarmed (0.11); (5) frustrated (0.09); (6) annoyed (0.09); (7) afraid (0.02), with 'angry' ranked at the top as the largest difference and 'afraid' ranked at the lowest as the least difference; and 'frustrated' and 'annoyed' sharing a same mean difference (0.09). The mean difference of seven HA and NV emotion between musicians and non-musicians' emotion are ranged from 0.02 (*Afraid*) to 0.22 (*Angry*).

Table 4.40

Means, mean difference and ranking for HA, NV emotion in musicians and non-musicians' Romantic music listening

Romantic Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Afraid	2.21	2.19	0.02	7
Alarmed	2.44	2.33	0.11	4
Angry	2.18	1.96	0.22	1
Tense	2.75	2.57	0.18	3
Frustrated	2.44	2.35	0.09	5
Annoyed	2.31	2.22	0.09	6
Distressed	2.54	2.33	0.21	2

Note: MD = Mean Difference

4.4.2.3 Low Arousal (LA) and Negative Valence (NV) emotion

Table 4.41 below displays the descriptive statistics of romantic music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking.

The mean difference on emotional variables in low arousal (LA) and negative valence (NV) when the musicians and non-musicians listen to romantic music are ranked as: (1) sad (0.36); (2) depressed (0.36); (3) gloomy (0.29); (4) droopy (0.19); (5) bored (0.18); (6) miserable (0.16), with 'sad' and 'depressed' ranked at the top as the largest difference and 'miserable' ranked at the lowest as the least difference; and 'sad' and 'depressed' sharing a same mean difference (0.36). The mean difference of six LA and NV emotion between musicians and non-musicians' emotion are ranged from 0.16 (*Miserable*) to 0.36 (*Sad, Depressed*).

Table 4.41

Means, mean difference and ranking for LA, NV emotion in musicians and non-musicians' Romantic music listening

Romantic Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Miserable	2.65	2.49	0.16	6
Sad	2.78	2.42	0.36	1
Depressed	2.74	2.38	0.36	2
Gloomy	2.77	2.48	0.29	3
Bored	2.08	1.90	0.18	5
Droopy	2.33	2.14	0.19	4

Note: MD = Mean Difference

4.4.2.4 Low Arousal (LA) and Positive Valence (PV) emotion

Table 4.42 below displays the descriptive statistics of romantic music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking. The mean difference on emotional variables in low arousal (LA) and positive valence (PV) when the musicians and non-musicians listen to romantic music are ranked as: (1) satisfied (0.43); (2) serene (0.34); (3) content (0.30); (4) at ease (0.25); (5) relaxed (0.25); (6) calm (0.20); (7) sleepy (0.11); (8) tired (0.04) with 'satisfied' ranked at the top as the largest difference and 'tired' ranked at the lowest as the least difference; and 'at ease' and 'relaxed' sharing a same mean difference (0.25). The mean difference of eight LA and PV emotion between musicians and non-musicians' emotion are ranged from 0.04 (*Tired*) to 0.43 (*Satisfied*).

Table 4.42

Means, mean difference and ranking for LA, PV emotion in musicians and non-musicians' Romantic music listening

Romantic Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Content	3.05	2.75	0.30	3
Satisfied	3.11	2.68	0.43	1
Serene	2.87	2.53	0.34	2
At ease	2.77	2.52	0.25	4
Calm	2.70	2.50	0.20	6
Relaxed	2.73	2.48	0.25	5
Tired	2.13	2.09	0.04	8
Sleepy	2.06	1.95	0.11	7

Note: MD = Mean Difference

4.4.2.5 Summary of different ranges of affective responses between musicians and non-musicians in romantic music listening

The Figure 4.39 to Figure 4.42 below illustrates the mean score of the 4 quadrant: (Fig. 4.39) high arousal (HA) and positive valence (PV); (Fig. 4.40) high arousal (HA) and negative valence (NV); (Fig. 4.41) low arousal (LA) and negative valence (NV); and (Fig. 4.42) low arousal (LA) and positive valence (PV).

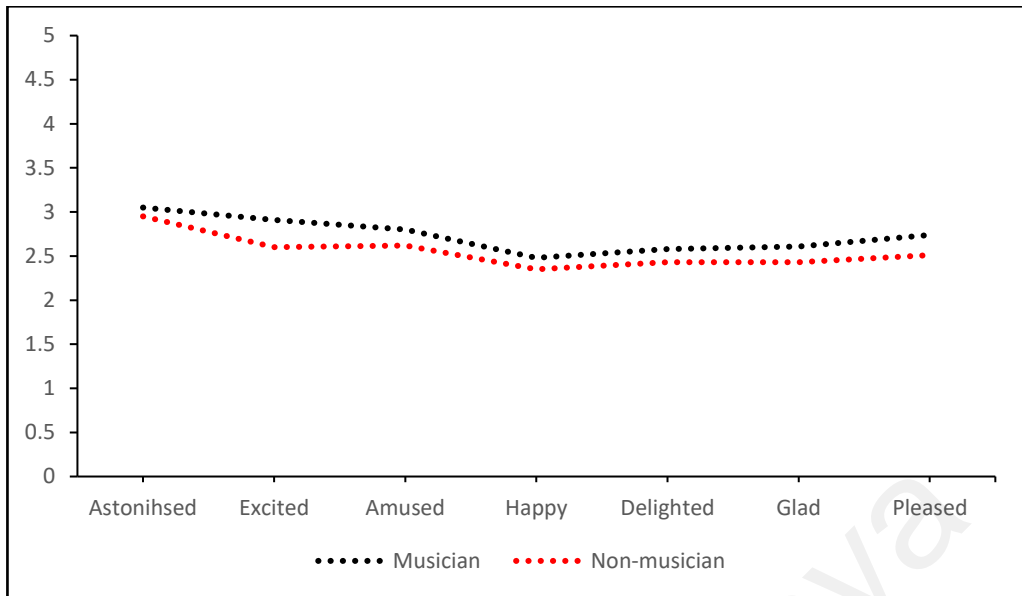


Figure 4.39 Romantic music listening mean score for HA, PV emotion between musicians and non-musicians

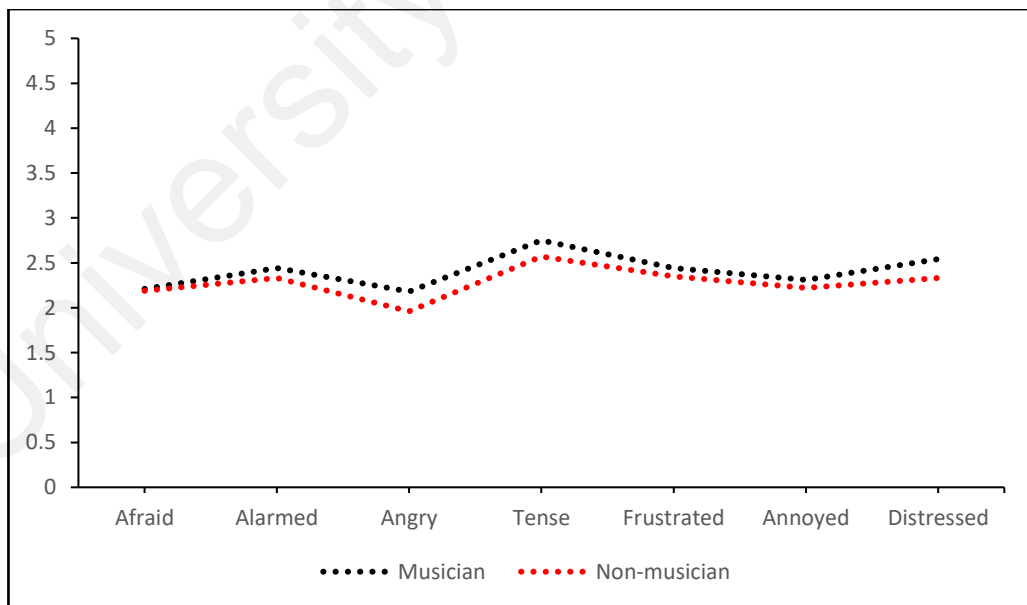


Figure 4.40 Romantic music listening mean score for HA, NV emotion between musicians and non-musicians

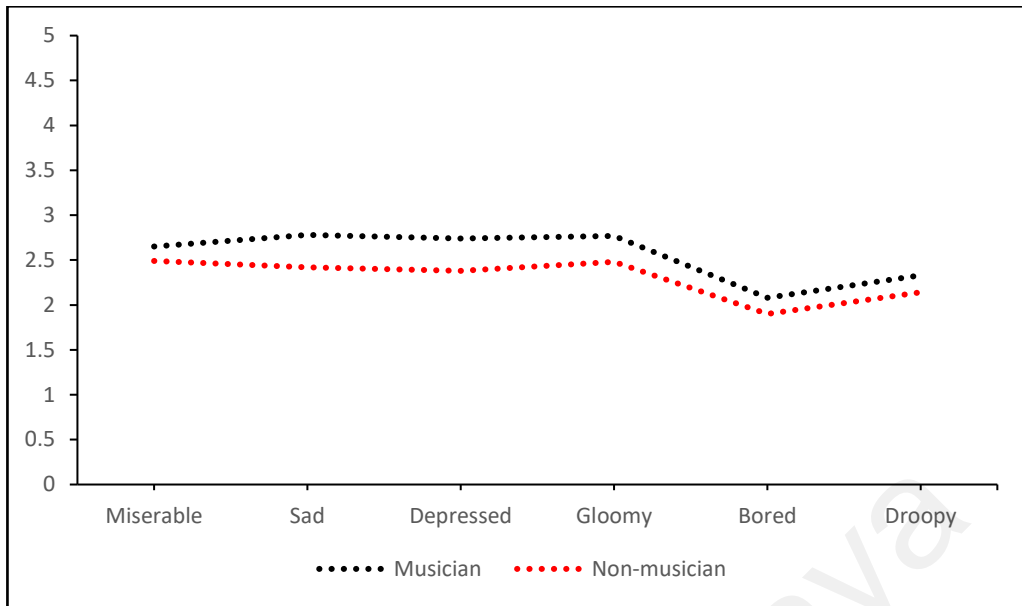


Figure 4.41 Romantic music listening mean score for LA, NV emotion between musicians and non-musicians

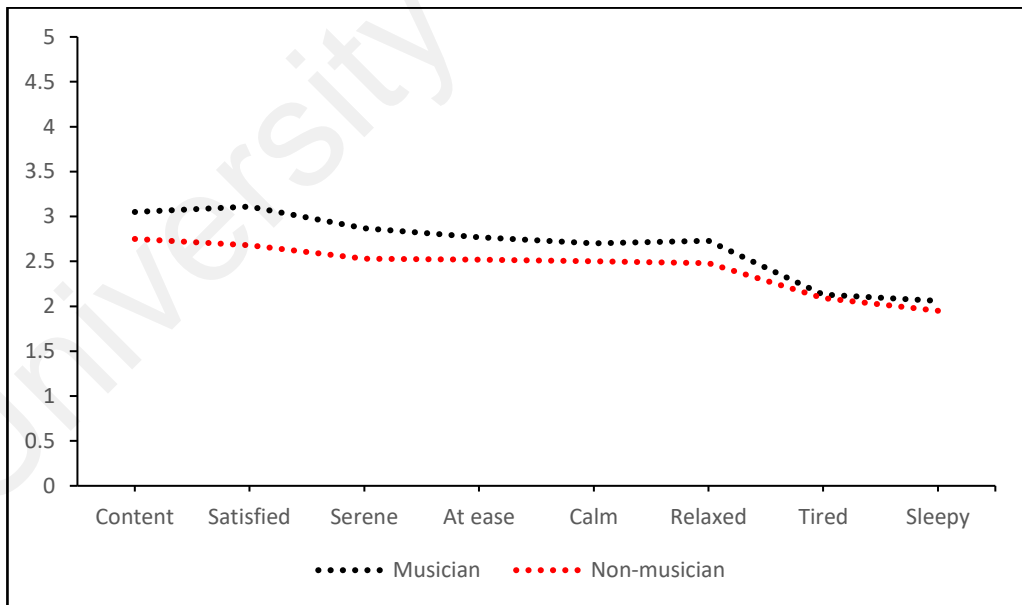


Figure 4.42 Romantic music listening mean score for LA, PV emotion between musicians and non-musicians

In sum, LA and NV emotion had the largest mean difference, with ‘sad’ and ‘depressed’ ranked at the top and ‘miserable’ ranked at the lowest. Followed by LA and PV emotion, with ‘satisfied’ ranked at the top and ‘tired’ ranked at the lowest. Third, HA and PV emotion, with ‘excited’ ranked at the top and ‘astonished’ ranked at the lowest. Lastly, LA and NV emotion had the least mean difference, with ‘angry’ ranked at the top and ‘afraid’ ranked at the lowest.

4.4.3 Atonal Music

The following presents a discussion on four different quadrants of emotions: (1) high arousal (HA) and positive valence (PV); (2) high arousal (HA) and negative valence (NV); (3) low arousal (LA) and negative valence (NV); and (4) low arousal (LA) and positive valence (PV) between undergraduate music major students and undergraduate non-music major students listen to atonal music.

4.4.3.1 High Arousal (HA) and Positive Valence (PV) emotion

Table 4.43 below displays the descriptive statistics of atonal music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking. The mean difference on emotional variables in high arousal (HA) and positive valence (PV) when the musicians and non-musicians listen to atonal music are ranked as: (1) astonished (0.41); (2) amused (0.33); (3) excited (0.26); (4) delighted (0.14) (5) happy (0.13); (6) pleased (0.11); (7) glad (0.04), with ‘astonished’ ranked at the top as the largest difference and ‘glad’ ranked at the lowest as the least difference. The mean difference of seven HA and PV emotion between musicians and non-musicians’ emotion are ranged from 0.04 (*Glad*) to 0.41 (*Astonished*).

Table 4.43

Means, mean difference and ranking for HA, PV emotion in musicians and non-musicians' Atonal music listening

Atonal Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Astonished	3.04	2.63	0.41	1
Excited	2.47	2.21	0.26	3
Amused	2.52	2.19	0.33	2
Happy	2.15	2.02	0.13	5
Delighted	2.21	2.07	0.14	4
Glad	2.13	2.09	0.04	7
Pleased	2.18	2.07	0.11	6

Note: MD = Mean Difference

4.4.3.2 High Arousal (HA) and Negative Valence (NV) emotion

Table 4.44 below displays the descriptive statistics of atonal music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking. The mean difference on emotional variables in high arousal (HA) and negative valence (NV) when the musicians and non-musicians listen to atonal music are ranked as: (1) distressed (0.39); (2) tense (0.33); (3) afraid (0.31); (4) angry (0.29); (5) alarmed (0.27); (6) annoyed (0.15); (7) frustrated (0.03), with 'distressed' ranked at the top as the largest difference and 'frustrated' ranked at the lowest as the least difference. The mean difference of seven HA and NV emotion between musicians and non-musicians' emotion are ranged from 0.03 (*Frustrated*) to 0.39 (*Distressed*).

Table 4.44

Means, mean difference and ranking for HA, NV emotion in Musicians and Non-musicians' Atonal music listening

Atonal Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Afraid	2.63	2.32	0.31	3
Alarmed	2.87	2.60	0.27	5
Angry	2.36	2.07	0.29	4
Tense	3.12	2.79	0.33	2
Frustrated	2.82	2.79	0.03	7
Annoyed	3.03	2.88	0.15	6
Distressed	2.78	2.39	0.39	1

Note: MD = Mean Difference

4.4.3.3 Low Arousal (LA) and Negative Valence (NV) emotion

Table 4.45 below displays the descriptive statistics of atonal music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking.

The mean difference on emotional variables in low arousal (LA) and negative valence (NV) when the musicians and non-musicians listen to atonal music are ranked as: (1) gloomy (0.16); (2) depressed (0.15); (3) sad (0.12); (4) miserable (0.09); (5) droopy (0.04); (6) bored (-0.04), with 'gloomy' ranked at the top as the largest difference and 'bored' ranked at the lowest as the least difference. The mean difference of six LA and NV emotion between musicians and non-musicians' emotion are ranged from -0.04 (*Bored*) to 0.16 (*Gloomy*).

Table 4.45

Means, mean difference and ranking for LA, NV emotion in musicians and non-musicians' Atonal music listening

Atonal Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Miserable	2.65	2.56	0.09	4
Sad	2.21	2.09	0.12	3
Depressed	2.52	2.37	0.15	2
Gloomy	2.62	2.46	0.16	1
Bored	2.51	2.55	-0.04	6
Droopy	2.45	2.41	0.04	5

Note: MD = Mean Difference

4.4.3.4 Low Arousal (LA) and Positive Valence (PV) emotion

Table 4.46 below displays the descriptive statistics of atonal music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking. The mean difference on emotional variables in low arousal (LA) and positive valence (PV) when the musicians and non-musicians listen to atonal music are ranked as: (1) satisfied (0.36); (2) content (0.33); (3) relaxed (0.22); (4) serene (0.18); (5) at ease (0.14); (6) calm (0.12); (7) sleepy (-0.30); (8) tired (-0.40) with 'satisfied' ranked at the top as the largest difference and 'tired' ranked at the lowest as the least difference. The mean difference of eight LA and PV emotion between musicians and non-musicians' emotion are ranged from -0.40 (*Tired*) to 0.36 (*Satisfied*).

Table 4.46

Means, mean difference and ranking for LA, PV emotion in musicians and non-musicians' Atonal music listening

Atonal Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Content	2.51	2.18	0.33	2
Satisfied	2.45	2.09	0.36	1
Serene	2.15	1.97	0.18	4
At ease	2.07	1.93	0.14	5
Calm	2.07	1.95	0.12	6
Relaxed	2.13	1.91	0.22	3
Tired	2.19	2.59	-0.40	8
Sleepy	2.22	2.52	-0.30	7

Note: MD = Mean Difference

4.4.3.5 Summary of different ranges of affective responses between musicians and non-musicians in atonal music listening

The Figure 4.43 to Figure 4.46 below illustrates the mean score of the 4 quadrant: (Fig. 4.43) high arousal (HA) and positive valence (PV); (Fig. 4.44) high arousal (HA) and negative valence (NV); (Fig. 4.45) low arousal (LA) and negative valence (NV); and (Fig. 4.46) low arousal (LA) and positive valence (PV).

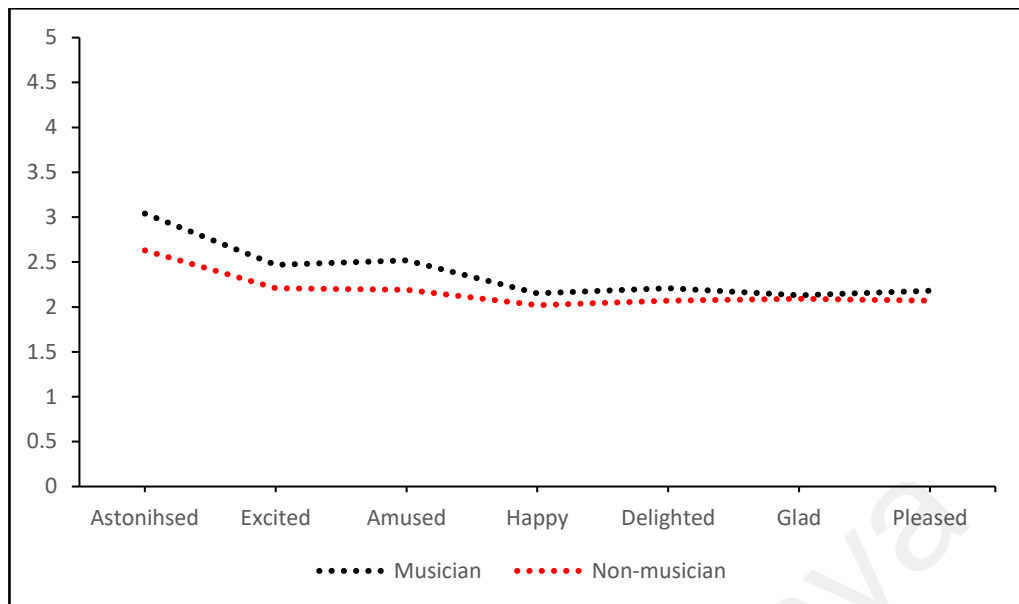


Figure 4.43 Atonal music listening mean score for HA, PV emotion between musicians and non-musicians

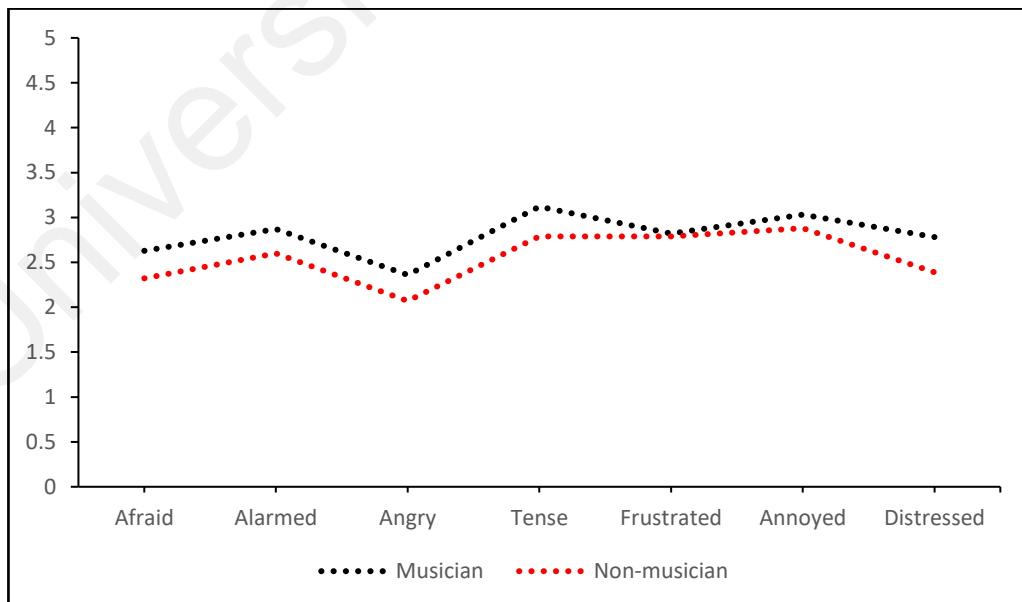


Figure 4.44 Atonal music listening mean score for HA, NV emotion between musicians and non-musicians

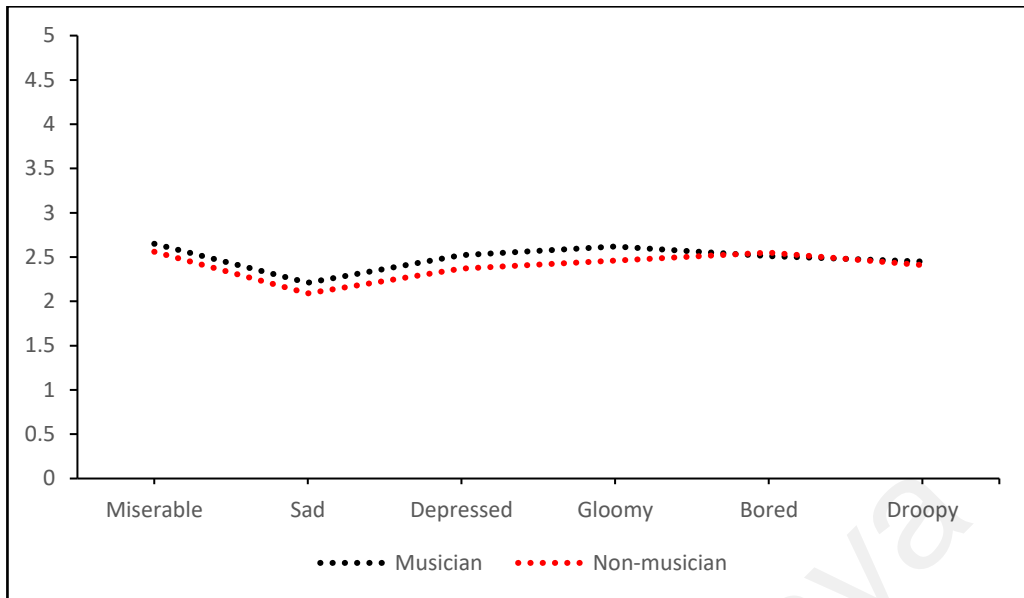


Figure 4.45 Atonal music listening mean score for LA, NV emotion between musicians and non-musicians

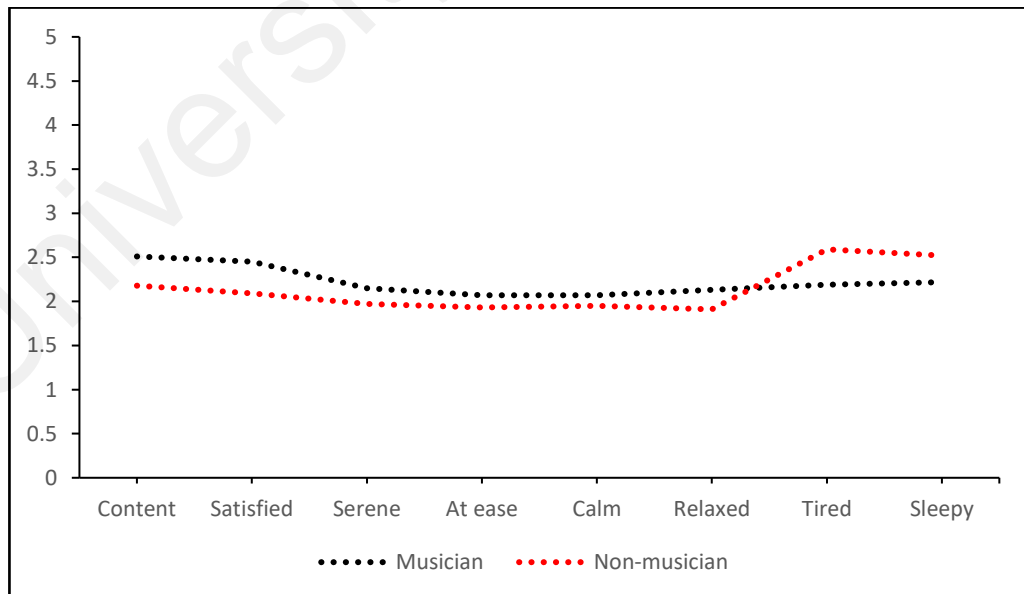


Figure 4.46 Atonal music listening mean score for LA, PV emotion between musicians and non-musicians

In sum, HA and NV emotion had the largest mean difference, with ‘distressed’ and ‘frustrated’ ranked at the top and ‘miserable’ ranked at the lowest. Followed by HA and PV emotion, with ‘astonished’ ranked at the top and ‘glad’ ranked at the lowest. There are two quadrants shared the same mean difference value, LA and NV emotion, with ‘gloomy’ ranked at the top and ‘bored’ ranked at the lowest. And, PA and NV emotion had the least mean difference, with ‘satisfied’ ranked at the top and ‘tired’ ranked at the lowest.

4.4.4 Experimental Music

The following presents a discussion on four different quadrants of emotions: (1) high arousal (HA) and positive valence (PV); (2) high arousal (HA) and negative valence (NV); (3) low arousal (LA) and negative valence (NV); and (4) low arousal (LA) and positive valence (PV) between undergraduate music major students and undergraduate non-music major students listen to experimental music.

4.4.4.1 High Arousal (HA) and Positive Valence (PV) emotion

Table 4.47 below displays the descriptive statistics of experimental music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking. The mean difference on emotional variables in high arousal (HA) and positive valence (PV) when the musicians and non-musicians listen to experimental music are ranked as: (1) astonished (0.51); (2) amused (0.31); (3) excited (0.23); (4) glad (0.16); (5) delighted (0.14); (6) happy (0.13); (7) pleased (0.13) with ‘astonished’ ranked at the top as the largest difference and ‘happy’ and ‘pleased’ ranked at the lowest as the least difference; and ‘happy’ and ‘pleased’ sharing a same mean difference (0.13). The mean difference of seven HA and PV emotion between musicians and non-musicians’ emotion are ranged from 0.13 (*Happy, Pleased*) to 0.51 (*Astonished*).

Table 4.47

Means, mean difference and ranking for HA, PV emotion in musicians and non-musicians' Experimental music listening

Experimental Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Astonished	3.13	2.62	0.51	1
Excited	2.43	2.20	0.23	3
Amused	2.38	2.07	0.31	2
Happy	1.94	1.81	0.13	6
Delighted	1.95	1.81	0.14	5
Glad	1.95	1.79	0.16	4
Pleased	1.92	1.79	0.13	7

Note: MD = Mean Difference

4.4.4.2 High Arousal (HA) and Negative Valence (NV) emotion

Table 4.48 below displays the descriptive statistics of experimental music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking.

The mean difference on emotional variables in high arousal (HA) and negative valence (NV) when the musicians and non-musicians listen to experimental music are ranked as: (1) alarmed (0.20); (2) tense (0.20); (3) afraid (0.17); (4) angry (0.11); (5) distressed (0.10); (6) frustrated (-0.05); (7) annoyed (-0.13), with 'alarmed' and 'tense' ranked at the top as the largest difference and 'annoyed' ranked at the lowest as the least difference; and 'alarmed' and 'tense' sharing a same mean difference (0.20). The mean difference of seven HA and NV emotion between musicians and non-musicians' emotion are ranged from -0.13 (*Annoyed*) to 0.20 (*Alarmed, Tense*).

Table 4.48

Means, mean difference and ranking for HA, NV emotion in musicians and non-musicians' Experimental music listening

Experimental Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Afraid	2.88	2.71	0.17	3
Alarmed	3.45	3.25	0.20	1
Angry	3.01	2.90	0.11	4
Tense	3.66	3.46	0.20	2
Frustrated	3.48	3.53	-0.05	6
Annoyed	3.52	3.65	-0.13	7
Distressed	2.98	2.88	0.10	5

Note: MD = Mean Difference

4.4.4.3 Low Arousal (LA) and Negative Valence (NV) emotion

Table 4.49 below displays the descriptive statistics of experimental music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking.

The mean difference on emotional variables in low arousal (LA) and negative valence (NV) when the musicians and non-musicians listen to experimental music are ranked as:

(1) gloomy (0.18); (2) depressed (0.10); (3) droopy (0.05); (4) sad (0.04); (5) miserable (-0.04); (6) bored (-0.04), with 'gloomy' ranked at the top as the largest difference and 'miserable' and 'bored' ranked at the lowest as the least difference; and 'miserable' and 'bored' sharing a same mean difference (-0.04). The mean difference of six LA and NV emotion between musicians and non-musicians' emotion are ranged from -0.04 (*Miserable, Bored*) to 0.18 (*Gloomy*).

Table 4.49

Means, mean difference and ranking for LA, NV emotion in musicians and non-musicians' Experimental music listening

Experimental Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Miserable	2.84	2.88	-0.04	5
Sad	2.17	2.13	0.04	4
Depressed	2.73	2.63	0.10	2
Gloomy	2.62	2.44	0.18	1
Bored	2.76	2.80	-0.04	6
Droopy	2.55	2.50	0.05	3

Note: MD = Mean Difference

4.4.4.4 Low Arousal (LA) and Positive Valence (PV) emotion

Table 4.50 below displays the descriptive statistics of experimental music listening which includes the mean scores for musicians and non-musicians, mean difference and ranking. The mean difference on emotional variables in low arousal (LA) and positive valence (PV) when the musicians and non-musicians listen to experimental music are ranked as: (1) satisfied (0.39); (2) content (0.25); (3) serene (0.24); (4) calm (0.24); (5) relaxed (0.22); (6) at ease (0.17); (7) sleepy (0.00); (8) tired (-0.23) with 'satisfied' ranked at the top as the largest difference and 'tired' ranked at the lowest as the least difference; and 'serene' and 'calm' sharing a same mean difference (0.24). The mean difference of eight LA and PV emotion between musicians and non-musicians' emotion are ranged from -0.23 (*Tired*) to 0.39 (*Satisfied*).

Table 4.50

Means, mean difference and ranking for LA, PV emotion in musicians and non-musicians' Experimental music listening

Experimental Music Listening				
Variables	Musicians	Non-musicians	MD	Ranking
	Mean	Mean		
Content	2.43	2.18	0.25	2
Satisfied	2.24	1.85	0.39	1
Serene	1.91	1.67	0.24	3
At ease	1.83	1.66	0.17	6
Calm	1.83	1.59	0.24	4
Relaxed	1.80	1.58	0.22	5
Tired	2.26	2.49	-0.23	8
Sleepy	2.16	2.16	0.00	7

Note: MD = Mean Difference

4.4.4.5 Summary of different ranges of affective responses between musicians and non-musicians in experimental music listening

The Figure 4.47 to Figure 4.50 below illustrates the mean score of the 4 quadrant: (Fig. 4.47) high arousal (HA) and positive valence (PV); (Fig. 4.48) high arousal (HA) and negative valence (NV); (Fig. 4.49) low arousal (LA) and negative valence (NV); and (Fig. 4.50) low arousal (LA) and positive valence (PV).

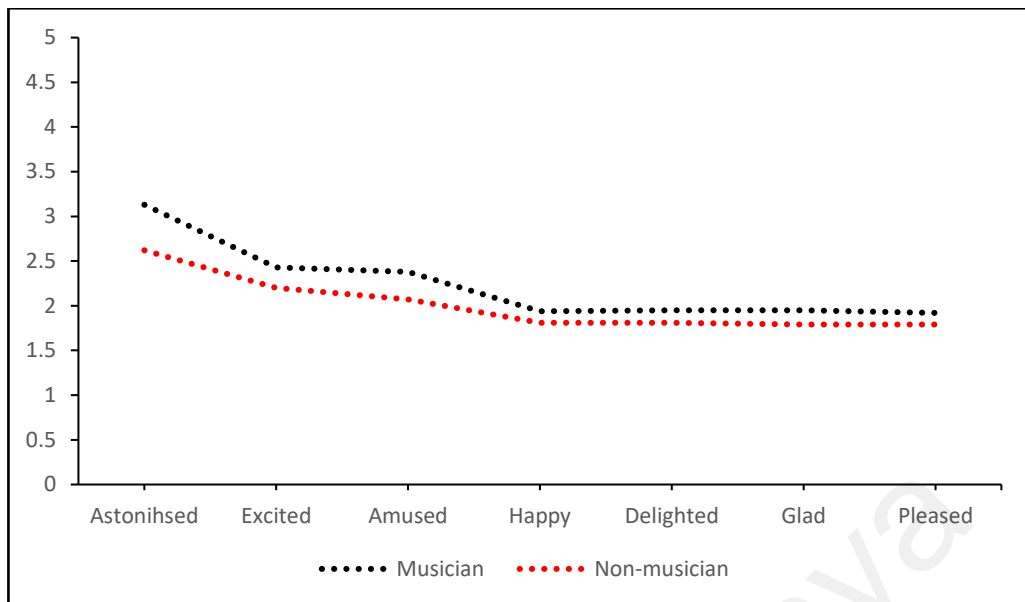


Figure 4.47 Experimental music listening mean score for HA, PV emotion between musicians and non-musicians

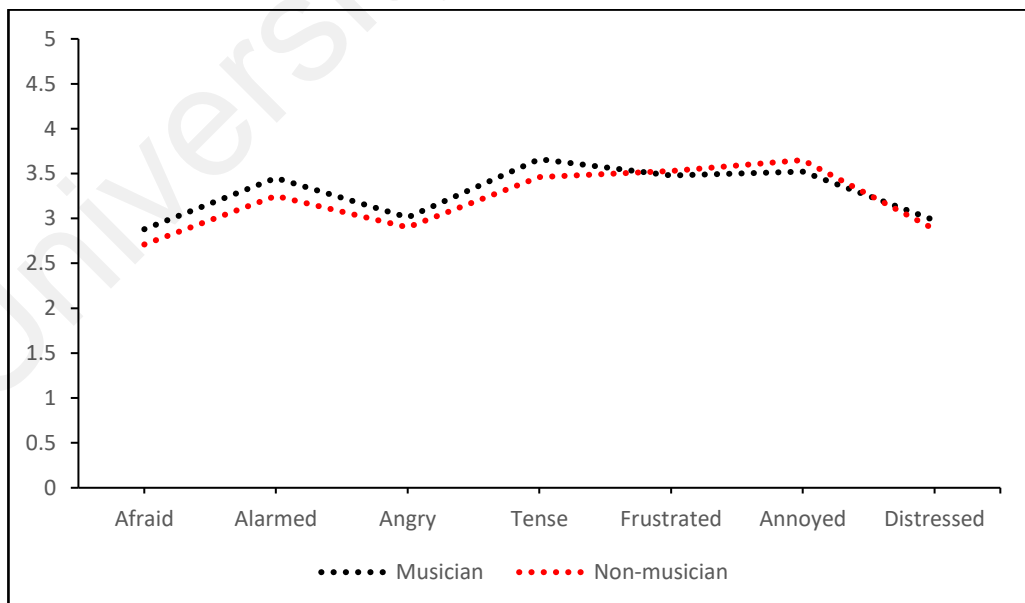


Figure 4.48 Experimental music listening mean score for HA, NV emotion between musicians and non-musicians

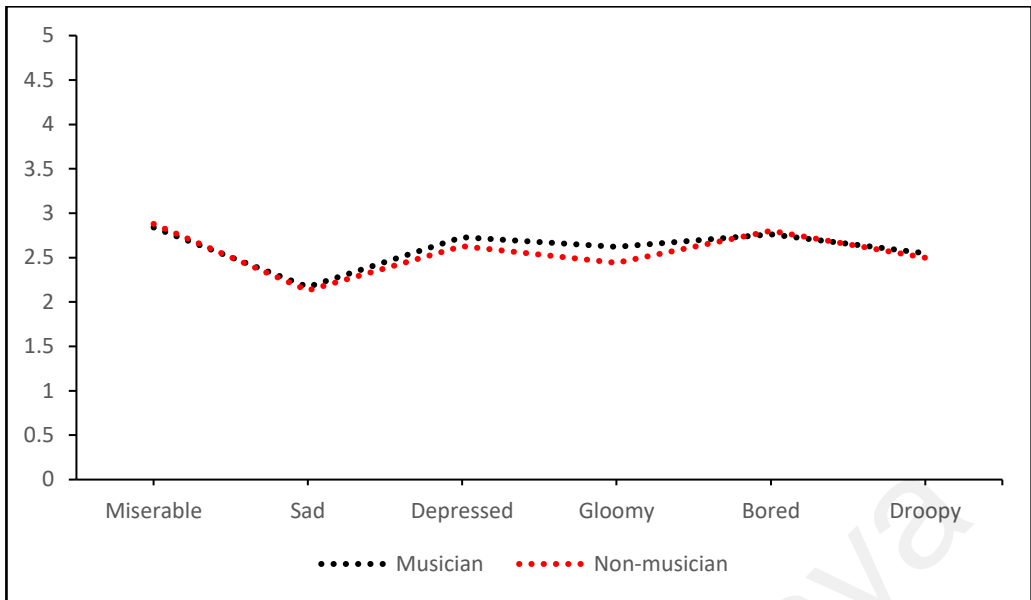


Figure 4.49 Experimental music listening mean score for LA, NV emotion between musicians and non-musicians

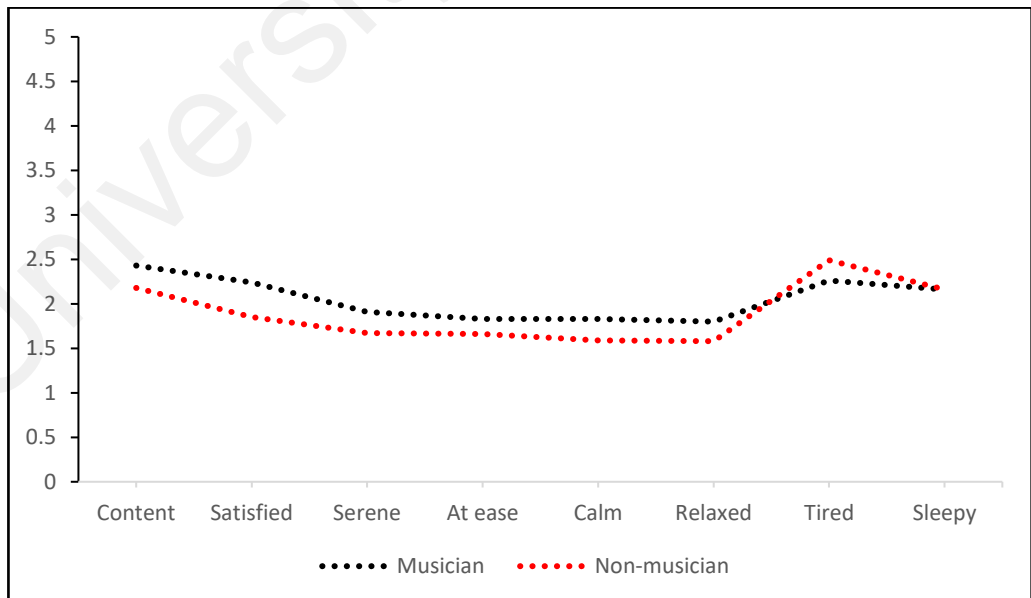


Figure 4.50 Experimental music listening mean score for LA, PV emotion between musicians and non-musicians

In sum, HA and PV emotion had the largest mean difference, with 'astonished' ranked at the top and 'happy' and 'pleased' ranked at the lowest. Followed by LA and PV emotion, with 'satisfied' ranked at the top and 'tired' ranked at the lowest. Third, HA and NV emotion, with 'alarmed' and 'tense' ranked at the top and 'annoyed' ranked at the lowest. Lastly, LA and NV emotion had the least mean difference, with 'gloomy' ranked at the top and 'miserable' and 'bored' ranked at the lowest.

4.5 Summary of Results

From the analysis performed, it can be concluded that musicians had performed a greater affective response in listening to four different genres of music, as most of the mean scores from four quadrants of Russell's Circumplex Model of Emotion are higher than non-musicians.

CHAPTER 5

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

5.1 Overview

This chapter presents the discussion, implication and recommendation of the study. The sections are organized as follows (1) summary of results, (2) discussion of finding of the study, (3) conclusion, (4) implication of the study, (5) recommendation for future study, (6) and closing remarks. The findings and recommendation were presented to address the research questions of the study. The research questions included:

1. What are the affective responses of undergraduate music major students listening to classical, romantic, atonal and experimental music?
2. What are the affective responses of undergraduate non-music major students listening to classical, romantic, atonal and experimental music?
3. What are the differences in the ranges of affective responses between undergraduate music major and non-music major students listening to classical, romantic, atonal and experimental music?

5.2 Summary of the Results

Overall, for Western classical music listening, musicians scored the highest average mean in high arousal (HA) and positive valence (PV) emotion (M=3.30), with 'delighted' (M=3.58) ranked at the top, and 'angry' (M=1.60) ranked the lowest, in high arousal (HA) and low valence (LV) emotion (M=1.76). For romantic music listening, although high arousal (HA) and positive valence (PV) emotion (M=2.74) had the highest average mean quadrant, but 'satisfied' (M=3.11), in low arousal (LA) and positive valence (PV) emotion (M=2.68) scored the highest mean among all the emotions, and 'bored' (M=2.08) ranked the lowest, in low arousal (LA) and negative valence (NV) emotion (M=2.56). For atonal music listening, musicians scored the highest average mean in high arousal (HA)

and negative valence (NV) emotion (M=2.80), with 'tense' ranked at the top (M=3.12), and 'at ease' and 'calm' (M=2.07) ranked the lowest, in low arousal (LA) and positive valence (PV) emotion (M=2.22). For experimental music listening, musicians scored the highest average mean in high arousal (HA) and negative valence (NV) emotion (M=3.28), with 'tense' (M=3.66) ranked at the top, and 'relaxed' (M=1.80) ranked the lowest, in low arousal (LA) and positive valence (PV) emotion (M=2.06).

For Western classical music listening on non-musicians, 'delighted' (M=3.64) ranked at the top in the highest average mean, high arousal (HA) and positive valence (PV) emotion (M=3.36), and 'angry' (M=1.27) ranked the lowest, in high arousal (HA) and low valence (LV) emotion (M=1.49). For romantic music listening, non-musicians scored the highest average mean in high arousal (HA) and positive valence (PV) emotion (M=2.56), with 'astonished' (M=2.95) ranked at the top, and 'bored' (M=1.90) scored the lowest, in low arousal (LA) and negative valence (NV) emotion (M=2.28). For atonal music listening, non-musicians scored the highest average mean in high arousal (HA) and negative valence (NV) emotion (M=2.55), with 'annoyed' ranked at the top (M=2.68), and 'relaxed' (M=1.91) ranked the lowest, in low arousal (LA) and positive valence (PV) emotion (M=2.14). For experimental music listening, non-musicians scored the highest average mean in high arousal (HA) and negative valence (NV) emotion (M=3.20), with 'annoyed' (M=3.65) ranked at the top, and 'relaxed' (M=1.58) ranked the lowest, in low arousal (LA) and positive valence (PV) emotion (M=1.90).

The largest mean difference between musicians and non-musicians in Western classical music listening are 'bored' (M=.37), in low arousal (LA) and negative valence (NV) emotion, and the least are 'amused' (M=-.22), in high arousal (HA) and positive valence (PV) emotion. For romantic music listening, the largest mean difference between musicians and non-musicians are 'satisfied' (M=.43), in low arousal (LA) and positive valence (PV) emotion, and the least are 'afraid' (M=.02), in high arousal (HA) and

negative valence (NV) emotion. It showed that all the emotions in Russell's Circumplex Model of Emotion on musicians scored higher than non-musicians. For atonal music listening, the largest mean difference between musicians and non-musicians are 'astonished' ($M=.41$), in high arousal (HA) and positive valence (PV) emotion, and the least are 'tired' ($M=-.40$), in low arousal (LA) and positive valence (PV) emotion. In experimental music listening, the largest mean difference between musicians and non-musicians are 'astonished' ($M=.51$), in high arousal (HA) and positive valence (PV) emotion, and 'tired' ($M=-.23$) had the least difference, in low arousal (LA) and positive valence (PV) emotion.

5.3 Discussion of Findings of the Study

This study investigated the affective responses of undergraduates' students in music listening to four different Western music genres: (1) classical music; (2) romantic music; (3) atonal music; and (4) experimental music.

Generally, the emotion responses on classical music and romantic music for both musicians and non-musicians are towards to positive valence (PV), and the emotion responses on atonal music and experimental music for both musicians and non-musicians are towards to negative valence (NV). Participants' overwhelming preferences towards classical music and romantic music may indicate that they are limited exposure to a wider variety of music genres. As stated in Brown (2012), it is possible for the people to prefer different music genres if they had the chance to listen and sufficient exposure.

Both musicians and non-musicians showed a very high mean score in high arousal (HA) and negative valence (NV) emotion and low arousal (LA) and negative valence (NV) emotion when they listen to atonal music and experimental music. The result had a similar finding with Scruton's (1997) study, as he stated that atonal music may portray negative emotions. But in contrast, the study by Sachs, Damasio, and Habibi (2015)

showed that sad music beautiful as compared to happy music as it deals with eudemonic concerns. Also, it helps individuals to cope from negative emotions, and instead it turns negative state to a positive affective state. They reported one choose to listen to sad music frequent due to feeling lonely, in emotional distress, or in contact with nature, also some individuals choose to listen to sad music is because of their preference. As stated by Wheeler (1985), a person would be in positive emotion when in a sad mood that listens to the music they like, whereas for a person that in a happy mood would experience a negative emotion when they listen to the music that they dislike. And in Juslin's (2013) study, he argued that pleasurable sadness can be remarked as a "mixed" emotion in which both positive affect and negative affect are happening at the same time.

The findings of this study suggested that in reference to every quadrant on Russell's Circumplex Model of Emotion, the musicians' average mean score when listens to four different types of Western music were higher than non-musicians. It is similar to the study from Daynes (2010), whereby she stated that musicians have more emotion intensity than non-musicians when they listen to tonal and atonal music. However, it is contradicted to Hamamoto, Botelho, and Munger (2010) studies where they found that non-musicians are sensitive to the tonal music compared to musicians.

5.4 Conclusion

The conclusion is made according to the purpose of study. For musician, the best emotion that describes them when they listen to four types of music were: 'delighted' (classical music); 'satisfied' (romantic music); 'tense' (atonal music); and 'tense' (experimental music). Whereas for non-musicians, the best emotion that describes them when they listen to four types of music were: 'delighted' (classical music); 'astonished' (romantic music); 'annoyed' (atonal music); and 'annoyed' (experimental music).

In sum, no major differences were reported between both musicians and non-musicians when they listen to four music genres with different types. For classical music and romantic music, emotion responses for both musicians and non-musicians were towards to positive valence, whereas for atonal music and experimental music, the emotion responses for both musicians and non-musicians were towards to negative valence. Thus, the differences in affective responses between musician and non-musician is predictable, however from the result collected, it can be implied that the music genre or style may not have an implication on it but rather on the melody structure and the familiarity of the music pieces (Theorell & Bojner Horwitz, 2019). According to the discussion, it might be the individual diverse music preference and taste, familiarity towards the music, or the exposure and opportunity to listen to different genre of music.

Furthermore, it could be another different perspective where the emotions in negative valence mainly seen as a negative emotion, however these emotions are frequent associated with some degree of pleasure in an aesthetic context. 'Catharsis' is a concept that developed by Sigmund Freud to explain the process of rapidly releasing negative emotions. It could explain why individuals would experience pleasure when they listen to sad music, as it is the way they release or expresses their emotions that have accumulated which to ease up their emotional tension (TenBrook, 2018).

Research into emotion felt in response to music listening is still in short supply, compared to other aspects of music listening, for example perceived emotion and preferences for music genres, specifically for atonal music as it does not explore massively by music psychologist.

5.5 Implications of the Study

The results in this study have shown that listening to different music genre does produce different type of emotions. With Circumplex Model of Emotion, it provides insight of which emotion in the circumplex best describe on the song listening from different music genre. Furthermore, this study provides suggestions of music listening repertoire for the most emotional benefits among individuals. However, it is recommended to discover more appropriate repertoires from various type of music genre to evoke emotion responses as a process of “catharsis healing”.

5.6 Recommendations for Future Study

There are various limitations of this study that should be acknowledged. To start with, in future study, researchers are recommended to include different types of music genres such as baroque music, jazz music, opera, popular music, rap music, reggae music, punk music, heavy metal music, rock music as in this study only delimited to four types of music which were classical, romantic, atonal and experimental music. Not only these few types of music, other most contemporary music can be also to included such as electronic dance music (EDM) and K-pop music that are contemporary trending globally.

Furthermore, the selection of the listening repertoire for this study needed further consideration. As in this study, only piano pieces were included, therefore it is recommended to include pieces with voice, orchestra pieces and other instrumentation in future research. It is analytical to understand what aspects of music genre characterize certain emotions. This will help to explain why individuals may use different emotion regulation strategies for different music genres. For instance, aspects such as tempo differences, complexity in rhythmic or melodic, time signature, and key signature in different genres should be included to expand the research on music listening and emotion responses in a broader context. The results in this study show that individuals may listen

to different music genres to control different aspects of their emotions, and further studies of other emotion management strategies could uncover more varied results across different music genres. Additionally, the choice of repertoire by researcher should be obtained through internet-based music services (Liljeström, Juslin, & Västfjäll, 2013). This is to guarantee that the repertoire that used in the research are not chosen based on the individual's preference of the researcher, which may lead to bias on music selection and influence the responses. Not only selection of repertoire, selection of participants should put in more considerations in the future research. As music students had different exposure to various levels of music appreciation, as well as acquisition of formal musical knowledge and non-formal musical knowledge from different courses taken in university. Thus, prior music listening experience of participants of different music genre may put into consideration for future research.

According to Remington, Fabrigar, and Visser (2000), although Circumplex Model of Emotion has been among the most widely studied representations of affect, nevertheless, there are some limitations of the model have been noted. Larsen and Diener (1992) have criticized the circumplex on the emotion that based on two-dimensional which are arousal level and valence level, that fails to capture the important aspects of emotional experience and therefore it does not reflect the differences between the same emotions. For example, excited and delighted are both high arousal and positive valence emotions that are located in the same region of the circle, yet these emotions are quite different from one another. Therefore, it is recommended that the concept of 'theory, research, and practice' (Natasi & Borja, 2015) should apply on future research so that music teachers can apply that on teaching pedagogy, and music appreciation on choosing music using this circumplex model, as circumplex model in this study only applicable on theory and research, but not on practice.

Additionally, there are limitations of quantitative research; firstly, it does not always shed light on the full complexity of human perceptions or experience, as the researcher do not know the inner voice of the participants. Although this method can reveal what or to what extent, but one problem is it cannot always explore how or why, and it cannot let the study have more reason why it is happened like that. Furthermore, it may give an incorrect impression of homogeneity in a sample. It is recommended to combine both qualitative and quantitative methods in future study. The advantages of using this method is it gives a broader perspective as the researcher are eligible to use both tools to use for data collection. Furthermore, mixed method research provides researcher a very rich data, this is due to researcher can find the answer from both methods, for instance mixed methods helps to answer the questions from qualitative approach, rather than just getting the result from quantitative approach alone, or vice versa (Creswell & Clark, 2006).

5.7 Closing Remarks

There are a lot of studies stated that music may arouse emotions in listeners. Therefore, focus in future research should be exploring how music can evoke emotions by using the concept of 'theory, research, and practice'. Overall, the study contributes to the music psychology in the area of music listening and emotion responses. It provides some findings on the comparative result between music listening to tonal music and atonal music in which atonal music is not explored broadly by music psychologist. Also, it suggests some new ideas and lists of listening repertoires for music listening using different genres and styles for further study and for future research in using Circumplex Model of Emotion.

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