MUSIC AND ITS EFFECTS ON EMOTION REGULATION, EMOTIONAL CATHARSIS AND PSYCHOLOGICAL WELL-BEING

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ABSTRACT

Music is generally considered a powerful tool to experience emotions. However, there is mixed research on whether it can hinder or enhance our emotional states. The present study aimed to explore this concept further. Moreover, the purpose of this study was to examine music's effects on emotional experiences and the potential mechanisms facilitating emotional catharsis when listening to music. These mechanisms included absorption, whether someone was a music major or not, mood-congruent music (sad), non-mood congruent music (happy), or white noise (control). A total sample of 68 students at CSUF was utilized, 40 being non-music majors and 28 being music majors. The Faces Scale and a Music Absorption Scale were used to measure emotional states before and after the musical intervention and to measure musical absorption levels, respectively. An independent samples *t* test was conducted, and it was found that musicians had significantly higher levels of musical absorption. An ANCOVA was performed, and the results found that music did facilitate emotional catharsis, but there were no major differences between musicians and non-musicians overall. However, the happy music did provoke the most emotional release, regardless of music major status. Interestingly, when listening to sad music, music majors experienced significantly more emotional release, therefore suggesting that if given specific conditions, facilitation of emotional catharsis through music can be effective and powerful. Implications of research findings, limitations and future directions are discussed

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CHAPTER 1

INTRODUCTION

General Background Research

The idea of music's powerful therapeutic qualities has been around since ancient times, and music has been said to create happiness and community (Batt-Rawden, 2010). Aristotle believed that sad music had healing properties (Garrido & Schubert, 2013). Recent evidence suggests that music can elicit emotional responses in everyday activities such as watching commercials or watching movies (Kreutz, Ott, Teichmann, Osawa, & Vaitl, 2007). Moreover, people utilize music to consciously alter their emotional state, and some research provides evidence that people rely heavily on music for this purpose (Getz, Marks, & Roy, 2014; Van Goethem & Sloboda, 2011). There are many reasons people choose to listen to music aside from emotional regulation, however. For example, people may use music to develop a social identity because music facilitates social involvement and communication. Also, it may enhance cognitive performance because some individuals may analyze the structural properties of music (Getz et al., 2014).

However, besides having potential to boost cognitive performance of individuals, structural properties of music are particularly pertinent to the current study because they dictate the basic meaning and emotions expressed in music. How fast or slow the music is (tempo), how loud or soft the music is (dynamics), how changes in the pattern of notes affect the sound (key changes), how the sound moves in a particular space (acoustics) and

the overall thematic sound of the music are all structural properties of music. Through the manipulation of musical properties (i.e. composing), music has the ability to communicate and express emotions to audiences, but music researchers have differentiated communication of emotion and expression of emotion because it is common for people to misconstrue the two ideas. According to Juslin (2005), communication of emotion through music occurs in several stages, which include the composer's expressive intention, the performer's expressive intention, the acoustic performance parameters, the listener's perception, and the listener's affective response.

In other words, the composer has a specific emotion or idea that he/she wants to convey to audiences through the music, then the performer will express the same piece of music through their own ideas, which depending on where and how the music is performed, may alter the perception of the music to the audience and therefore, affect their emotional response. Expression of emotion in music is similar, but it emphasizes the dynamic relationship between the acoustic and structural properties of music and how the listener perceives it (Juslin, 2005). Studies on popular music have shown that people in general understand the messages and experience the emotions that an artist is trying to portray to their audiences (Juslin, 2005).

Therefore, communication and the expression of emotion work together in that the listener perceives the intent due to the acoustic and structural properties the composer has created (Juslin, 2005). If the music is composed in such a way to elicit a specific response, the audience is more likely to perceive the composer's intent. Conversely, it should be noted that even if the intentions of a composer to relay a message or induce a specific emotion are clear, some people may not feel the intended emotion or the message

may not resonate with them (Juslin & Laukka, 2004). For example, more complex emotions like loss may also be much more difficult to express through music because the more complex an emotional experience becomes, the more subjective the interpretations of the music to the listener become because the experience of loss is more likely to be different for many individuals (Juslin & Laukka, 2004).

Researchers have been trying to discover the mechanisms that dictate listener's affective states and how music possesses these communicative and emotional properties. For instance, Swaminathan and Schellenberg (2015) state in their overview of music research that there is a relationship between musical genre and emotional benefits in that after participants were induced to feel anxious, exposure to music from a preferred genre reduced anxiety levels more than simply sitting in silence. Jiang, Zhou, Rickson, and Jiang (2013) add to this idea, suggesting that musical genre preference also affects the degree to which stress reduction occurs when listening to relaxing or stimulating music. If the intention of the music listener is to reduce stress, then it may in fact reduce stress, especially if the specific intention is to relax (Linnenmann, Ditzen, Strahler, Doerr, & Nater, 2015).

Some research has examined how music affects the brain's cognition. In a study conducted by Baumgartner, Esslen, and Jancke (2006), they assessed the combined effects of musical stimuli with pictures compared to pictures alone and audio alone on emotional experience using an Electroencephalogram (EEG). They found that participants who listened to music combined with affective pictures experienced much more emotional affect than the other groups (Baumgartner et al., 2006). Another study showed that musicians who experience "chills" from listening to music activate similar

brain regions associated with reward from drug addiction and food consumption (Weinberger, 2004).

While there have been many studies on music portraying how the emotional experience with music is a multifaceted phenomenon, the present study examined emotion regulation, music and how it relates to psychological well-being. Music listening may be a healthy way to experience emotional release (Bat-Rawden, 2010; Croom, 2015; Huron, 2011; Saarikallio & Erkkila, 2007; Sachs, Damasio, & Habibi, 2015). The current study's goal was to compare musicians' and non-musicians' ability to experience emotional catharsis to promote psychological well-being and homeostatic balance. The critical mechanisms that were explored that potentially facilitate emotional catharsis include mood-congruent music (Bat-Rawden, 2010; Croom, 2015; Huron, 2011; Saarikallio & Erkkila, 2007; Sachs, Damasio, Habibi, 2015), non-mood congruent music (Garrido & Schubert, 2013; Garrido & Schubert, 2015; Hunter, Schellenberg, Griffith, 2011; Van den Tol & Edwards, 2015), absorption (Herbert, 2011; Rhodes et al., 1988; Sandstrom & Russo, 2011; Sandstrom & Russo, 2013), and whether or not the listener is a musician or non-musician (Garrido & Schubert, 2011; Kreutz, Ott, Teichmann, Osawa, Vaitl, 2007; Park et al., 2014; Sandstrom & Russo, 2011; Weinberger, 2004).

Emotional Catharsis Theory

There are several theories about emotional catharsis that have been established within the psychological field, with Sigmund Freud being the first to develop the concept. The basic premise of emotional catharsis is a psychological process by which an individual expresses or releases their emotions that have accumulated overtime which alleviates his/her emotional tension (Bylsma, Vingerhoets, & Rottenberg, 2008). Freud

specifically developed his own theory of catharsis, stating that individuals accrue emotions and if these emotions are not expressed, then individuals may experience psychological problems like hysteria (Blysma et al., 2002; Bushman et al., 1999; Bushman, Baumeister, & Stack, 2002).

Also, Freud's concept of Thanatos is defined as an instinctual motivation in humans towards self-destruction and aggression was related to catharsis in that humans are constantly trying to reduce their aggressive drive by releasing his or her aggression through socially acceptable ways like displacement or catharsis (Gentile, 2013). The latter can be achieved by watching someone else participate in aggressive activities or by watching someone else exhibit aggressive behaviors (Gentile, 2013).

Furthermore, Freud posits the primary mechanism of catharsis known as the hydraulic model of anger. The hydraulic model states that frustration leads to anger and if the anger is not expressed or released, then the anger will accumulate like a pressure cooker (Bushman et al., 1999). In turn, the individual will eventually explode with intense aggression (Bushman et al., 2002). When an individual releases their anger in some way, they will relieve some of their emotional build up (Blysma et al., 2008). It should be noted that Freud's theory of catharsis has not been sufficiently supported by empirical research and in fact, the findings show the opposite effect. When individuals express their pent-up aggression, they tend to exhibit significantly more subsequent aggressive behavior (Bohart, 2009; Bushman et al., 1999; Bushman et al., 2002; Mallick & McCandless, 1966). One study compared the effects of media on aggression that promoted a procatharsis (releasing aggression) and anticatharsis (not releasing aggression) message and found that participants who received the procatharsis message

were not only more likely to perceive catharsis as an effective way to reduce anger, but they were also more likely to engage in consequent violent behavior (Bushman et al., 1999).

Similarly, Bushman (2002) conducted a study assessing the moderating effects of rumination and distraction on the catharsis model. Rumination was defined as the process of focusing one's energy on the self, specifically one's negative affective state (Bushman, 2002) and distraction was defined as thinking about another purpose unrelated to one's emotional state (Bushman, 2002). Participants in the ruminating condition were angered and were primed to think about the person who angered them while punching a bag, and participants in the distraction group experienced the same anger but would think about becoming physically fit. These groups were compared to a control group with neither manipulation. The study found that participants in the rumination group experienced more anger and exhibited significantly more aggressive behavior compared to participants in both the distraction and control groups. Participants in the control group exhibited the least amount of aggressive behavior and were the least angry (Bushman, 2002).

Ultimately, research does not support catharsis theory. The majority of previous literature has explored this model only in the context of Freud's original theory (Bohart, 2009; Bushman et al., 1999; Bushman et al., 2002; Mallick & McCandless, 1966). However, other emotions have been examined applying the cathartic model, but there are limited experimental designs exploring this idea. One of the goals of the present study was to apply the cathartic model to sadness in a quasi-experimental design to examine

whether people who have bottled up sadness can experience a healthy expenditure of emotion by listening to music.

Mood Congruent Music Listening

There is a growing body of research to suggest that listening to music can facilitate expression of sadness for cathartic purposes and that releasing accrued sadness can be beneficial for psychological well-being (Bat-Rawden, 2010; Croom, 2015; Huron, 2011; Saarikallio & Erkkila, 2007; Sachs, Damasio, & Habibi, 2015). Music may have a role in inducing happiness and serenity and can be utilized to regulate a diverse range of affects including disgust and sadness (Croom, 2015). Furthermore, music possesses potential survival value for patients with enduring illnesses in that music can evoke an emotional awareness of their plight and facilitate their emotional journey, which can induce cognitive reappraisal of their life in general (Batt-Rawden, 2010). In a study with adolescents who regularly engage with music, when experiencing sadness after a traumatic life event, mood congruent music can be a framework onto which an adolescent can project one's own feelings and experiences onto to personify their current emotional state which promotes emotional release and consequently, positive feelings (Saarkallio & Erkkila, 2007). For example, if an individual has just lost a loved one and if they listen to a song that conveys that specific kind of loss, they are able to project those feelings onto the music because it resonates with their state of mind, which creates a tangible quality to the emotion because the emotion is created and expressed through the musical stimuli.

Moreover, Sachs, Damasio, and Habibi (2015) conducted a narrative review on how listening to sad music evokes pleasurable feelings. They found that overall, sad music seems to be a good aid in maintaining homeostasis in individuals. Homeostasis is

the process in which someone will maintain internal emotional balance to maximize functioning, well-being, and survival (Sachs et al., 2015). An imbalance in response to a stimulus results in emotional pain and discourages the individual from engaging in these behaviors. Listening to sad music and the pleasure gained from it could imply that homeostatic imbalance was present in the individual at the time of listening, and thus, listening to the sad music promoted homeostatic balance (Sachs et al., 2015). If individuals don't find sad music pleasurable, there may have not been homeostatic imbalance present initially or another plausible explanation is that the music didn't fix the imbalance (Sachs et al., 2015). This concept is a crucial component that the present study will be measuring to assess participants' mood states after musical intervention.

To continue, research also suggests that listening to sad music while experiencing sadness can exacerbate negative feelings associated with sadness, depending on several moderating variables (Garrido & Schubert, 2013; Garrido & Schubert, 2015; Hunter, Schellenberg, Griffith, 2011; Van den Tol & Edwards, 2015). This may be due to, in part, emotional biases that inducing a sad mood presents. One study found that people who are induced with a sad mood tend to perceive more sadness from music, regardless of whether the music expresses sadness or not (Hunter et al., 2011). Garrido and Schubert (2013) hypothesized that people who engage in rumination more frequently will experience higher levels of negative affect after listening to sad music and those same people will perceive benefits from listening to sad music, despite their actual emotional experience. They confirmed this hypothesis and also found that ruminators who listened to happy music experienced more substantial mood increases than participants who ruminated less, which may suggest that depending on the musical affect, music may

affect psychological well-being for people who tend to ruminate more than others (Garrido & Schubert, 2013).

Also, Van den Tol and Edwards (2015) investigated how participants selected music to regulate their mood after enduring a negative life event by assessing their self-regulatory goals and reported effects after listening. They found that people who listen to self-induced sad music when experiencing sadness while engaging in cognitive reappraisal and/or distraction self-regulatory techniques do experience positive feelings. However, if people intentionally engage in distraction as a self-regulatory action too often, it may be more indicative of a maladaptive coping strategy. This is because people are passively trying to fix the problem or wallowing in their emotional experience to an extent that will exacerbate the problem (Van den Tol & Edwards, 2015). Also, they contend that people are unlikely to experience mood enhancement when they experience sadness and mood-enhancement simultaneously. People are unlikely to engage in self-regulatory strategies with the goal of becoming more self-aware of their negative mood to increase mood enhancement (Van den Tol & Edwards, 2015). The present study mitigated this issue because participants did not engage in self-regulatory action for mood enhancement. Participants were not cognizant of the fact that they were experiencing mood regulation through music.

Hence, the research suggests that moderators such as rumination and self-regulatory goals may influence someone's emotional experiences that may not lead to more positive mood states. In spite of this, there appears to be limited research on how the moderating effects of absorption influence emotional catharsis when listening to music. Absorption is the ability to focus on a stimulus or stimuli with minimal effort.

Another aim of the current study is to examine the extent to which a person's absorption capacity will influence the effectiveness of music listening for emotional catharsis, thereby producing positive emotional outcomes.

Absorption

Absorption is an individual's capability to deeply focus on a stimulus or a task with minimal effort coupled with decreased awareness of the self and external factors (Garrido & Schubert, 2011; Herbert, 2011). Absorption has the potential to be a strong moderator of the intensity of emotional response to music (Sandstrom & Russo, 2013). Research has shown that absorption is a good predictor of music's capability to influence one's mood and is also an important moderator in the intensity of emotions that an individual experiences when listening to music (Herbert, 2011; Sandstrom & Russo, 2011). In an early study, Rhodes, David and Combs (1988) had participants take the Tellegen Absorption Scale to measure their capacity for absorption and correlated that with how much they enjoyed the classical, country, rock, and new age music that was played. They found that when participants listened to classical music, they had higher levels of absorption and liking of classical music.

This is important because Herbert (2011) states that music can provide many opportunities for people to engage with it due to its multifaceted nature, thereby instigating absorption. That is to say that music has nearly infinite possibilities for emotional engagement because of the inherently malleable nature of music and any one manipulation of the music can provoke a response. So it would seem plausible that classical music may be more effective in facilitating absorption because of its structural complexity compared to other genres of music and therefore increase liking (Rhodes,

David, & Combs, 1988). Also, absorption appears to be positively correlated with people who participate in the performing arts, and people who are absorbed with music are less likely to be distracted or daydream (Garrido & Schubert, 2011, Sandstrom & Russo, 2011).

Park et al. (2014) conducted a study comparing musicians' and non-musicians' behavioral and neural responses to happy, sad and fearful music. They discovered that musicians experienced significantly more arousal when listening to sad and fearful music than non-musicians. Moreover, they found that musicians had more brain activity in their right-prefrontal cortex after listening to sad music, which indicates that musicians may be more capable of processing emotional affect when listening to sad music and experience the emotions more poignantly (Park et al., 2014). Additionally, Weinberger (2004) states that long-term learning generates more sensitive responses and physical changes in the brain and since musicians practice music for hours everyday for years, their brains in comparison to non-musicians will significantly differ (Weinberger, 2004). Some research shows that the auditory cortex in musicians is generally bigger than non-musicians' auditory cortex (Weinberger, 2004). Since absorption is positively correlated with performing arts involvement, this may explain why musicians listening to sad music could experience emotional catharsis more profoundly than non-musicians because they are more likely to have more brain capacity for musical engagement, maintain focus longer, and experience more emotional intensity (Garrido & Schubert; Park et al., 2014; Sandstrom & Russo, 2011; Weinberger, 2004).

Tellegen & Atkinson (1974) created one of the first scales to measure absorption called the Tellegen Absorption Scale (TAS). Current studies on music have used it to

measure absorption (Herbert, 2011). However, there are some problems with using this particular scale to measure absorption in a musical context. The scale lacks questions specifically referencing music, which compromises the validity of the experiment (Sandstrom & Russo, 2013). Sandstrom and Russo (2013) created a new scale, incorporating and modifying items from the TAS, which was the first scale developed to assess individual differences in emotional responses to music by specifically gauging musical absorption levels. They defined musical absorption as "an individual's willingness and ability to allow music to draw them into an emotional experience," (Sandstrom & Russo, 2013, p. 216). Thus, the present study employed this scale to measure musicians and non-musicians absorption capacities. Moreover, the current study predicted that musicians will possess higher absorption capacity than non-musicians and should be able to disregard the laboratory setting more effectively, rendering musicians more susceptible to emotional release through musical intervention (Kreutz et al., 2007).

Purpose of the Current Study

The main purpose of the current study is to reinforce the idea that music is a powerful and accessible medium that contributes to the collective psychological well-being of society. Despite music being an allegedly insecure profession, music has a much grander purpose than being merely a career choice. It has the power to touch peoples' lives emotionally and psychologically. Music programs are often unsupported in schools because of the societal rhetoric that music does not provide steady work and it is largely frivolous compared to more practical subjects like history and physics. Additionally, research has shown that music teachers may be largely unsupported by faculty, staff and parents (Gardner, 2010; Krueger, 2000) and this leads to teacher

burnout and higher attrition rates (Baker, 2007; Heston, Dedrick, Raschke, & Whitehead, 1996), thus leading to weaker music education. This could be prevented if administrators, faculty and parents of the community realized the importance of music in everyone's lives, not just for musical students, and therefore, maintain the music programs in schools. This study's goals are to contribute empirical evidence that music affects our emotional experiences in a healthy way, what factors can help us achieve these goals and why music is important to schools and society.

Hypotheses

Hypothesis 1: Musicians will possess more absorption capacity than non-musicians, which will be a strong predictor of the extent to which emotional catharsis is experienced. As mentioned, research has shown that absorption is a good predictor of music's capability to influence one's mood and the intensity of the emotional experience (Herbert, 2011; Sandstrom & Russo, 2011).

Hypothesis 2: Musicians will experience more emotional catharsis than non-musicians, regardless of whether the music is congruent or non-congruent with the listener's emotional state. Individuals in the performing arts tend to have more absorption ability, so musicians listening to sad music could experience emotional catharsis more distinctly because they are more likely to possess more brain capacity for musical engagement, more likely to maintain focus longer, and experience more emotional intensity than non-musicians (Garrido & Schubert; Park et al., 2014; Sandstrom & Russo, 2011; Weinberger, 2004).

Hypothesis 3: Sad music will facilitate the most emotional catharsis compared to the happy music and the white noise (control) for music majors and non-music

majors. Since the music will be mood-congruent, the music should resonate with their emotional experience and relieve the tension, and create homeostatic balance (Sachs et al., 2015).

Hypothesis 4: Musicians who listen to mood-congruent music (sad) will experience more emotional catharsis than musicians who listen to mood non-congruent music (happy). Listening to sad music to maintain homeostatic balance seems to be effective in promoting good feelings (Sachs et al., 2015). As Sachs et al. (2015) mention, homeostatic imbalance is when emotional tension is present (sadness is experienced) and listening to sad music facilitates the release of the emotional tension i.e. emotional catharsis. Also, mood congruent music can present a framework in which an individual can project one's current emotional state to a tangible medium, which promotes emotional release and consequently, positive feelings (Saarkallio & Erkkila, 2007).

CHAPTER 2

METHODS

Participants

A mix of convenience, acquaintance and random sampling was used to attain a total of sample 72 CSU Fullerton student musicians (n = 30) and non-musicians (n = 42), though the final sample was 68 (N = 68) due to missing data in the musical absorption scale. Thus, two musicians (n = 2) and two non- musicians (n = 2) had missing data and were taken out of the sample. Musicians were defined as students who were currently enrolled in the CSUF music major program, and non-musicians were students who have not performed or played a musical instrument, including voice, within the last 10 years. This did not have to be professional, but rather the participant could not be a consistent player of an instrument or a singer. Students in the music major are required to audition as part of the admission process into the music program, thus creating a more objective definition of a musician and controlling for musical competency and ability.

There were 42 females (n = 42) and 30 males (n = 30) in the original sample. There were two females and two males in the musician and non-musician groups with missing data, so there were 40 females (n = 40) and 28 males (n = 28) in the final sample. All musicians stated they had been playing their primary musical instrument for five years or more and non-musicians reported that they would attend concerts and listen to music during daily activities, the latter being the most common. The sample was

obtained through various music classes and the SONA system, respectively. SONA is an undergraduate research pool where researchers can recruit undergraduates in psychology classes at their respective colleges to participate in their studies for course credit.

Materials

Script

A script was carefully written to standardize the language when conversing with each participant and to follow the same procedure for every participant. This was to maintain consistency throughout the study and to minimize provocation of undesired emotional responses from participants. Please refer to Appendix D for the full script.

Faces Scale

The Faces Scale (Andrews & Withey, 1976) was used to measure participants' baseline emotional state prior to the experiment and after they listen to the musical intervention. The Faces Scale is a basic measurement of emotion that is comprised of seven different faces with different emotional affects. It has seven different faces range from A-G with face A depicting the saddest face while face G conveys the happiest face (See Figure 1). The validity coefficient for this scale is about .80 for measuring psychological well-being, which in the context of this study indicates emotional state (Andrews & Crandall, 1976).

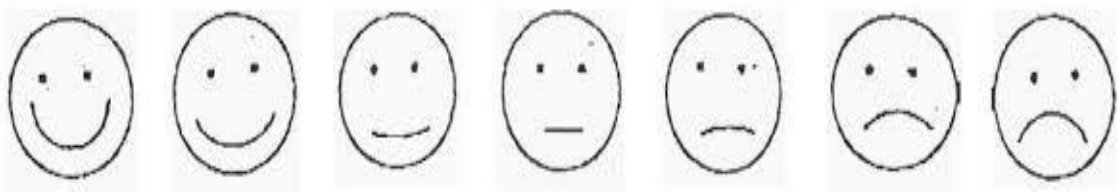

Figure 1. The faces gradually become more in the shape of a frown going from A to G. For the purpose of the analysis, the letter responses were later coded into numbers. Letter A was converted into a 1 and letter B was converted into a 2 and so on.

Emotional Manipulation

A YouTube video titled, "Why CNN commentary cried (Campbell Brown),"depicts a news story of a young girl who is trapped under rubble after a devastating earthquake in Haiti and is taken to the hospital only to die later that same day (See Appendix A for link). The goal of the video was to induce sadness in each participant to create some emotional tension before the musical intervention so that participants could experience emotional catharsis while listening to music. Thus, only participants who indicated they were feeling neutral or happy before the experiment began received the emotional manipulation. The impetus for choosing this particular video was because people are more likely to empathize and feel sad about someone who is suffering from the consequences of a natural disaster because the victim had no control over the event, unlike many other situations that could elicit other emotional responses (i.e. political issues, relationship problems, etc.).

A paired-sampled *t* test was performed between the pre experiment emotional state scores and the YouTube video emotional reaction scores to further ensure the provocation of sadness for participants. It should be noted that 28 participants reported their emotional reaction to the video. The results showed that there was a significant difference between the participants' emotional state prior to the start of the experiment (M = 2.39, SD .832) and their emotional state after watching the video (M = 5.57.179, SD = 1.2). Thus, it is safer to assume that the YouTube video did induce a sad response in participants and that they possessed emotional tension prior to music listening, $t(27) = 11.090$, $p < .001$.

Musical Intervention

Two pieces of music and a white noise control condition were utilized. To determine the pieces used for the study, 5 musicians were asked to listen to 10 pieces of music. They were told to write up their reactions to the music, but not necessarily their feelings about the piece to avoid priming an emotional response to the pieces. If they indicated an emotional reaction (happiness or sadness), a word, or a phrase in their description that was indicative of sadness or happiness, each of those instances counted as one point. The pieces that garnered the most points for each respective emotion were chosen for the experiment. The sad piece of music was called "Unforgotten," by Martin O'Donnell and Michael Salvatori, the happy piece of music was called "Kingdom Celebration" by Alan Menken, and the control condition was a white noise audio track, which was a large crowd of people talking, providing audio stimulation for the participant but not musical stimulation.

Each track was approximately 2 minutes long. This was to control for the potential natural time elapse of emotional experience and to ensure that the musical intervention is more than likely promoting emotional release. "Unforgotten" possesses a slow tempo, softer volumes, and a minor key while "Kingdom Celebration" possesses a faster tempo, louder volumes and a major key, which characterizes sad and happy music respectively, so the chosen pieces of music align with previous research (Hunter, Schellenberg, & Griffith, 2011). The music and white noise were played on the researcher's personal Macbook Air computer with a set of high quality Seinheisser HD 6XX headphones to produce optimal sound quality for music listening.

Distracter Task

A short distracter task with ten simple anagram puzzles taken from Gihooly & Johnson's (1978) list of words was administered to account for participants who may figure out the true purpose of the study. The words chosen were based on their anagram order similarity, which means that the higher the number assigned to that attribute, the more letters are already in their correct place, which makes the puzzle easier (See Appendix B).

Musical Absorption Scale

The Absorption in Music Scale (Sandstrom & Russo, 2013) was administered on Qualtrics. Qualtrics is an academic website that provides tools for constructing surveys for research purposes and allows for anyone with a link to the survey(s) to complete it. It also compiles the data, which can be exported to a statistical program, such as SPSS. The Absorption in Music Scale is a scale that measures the degree to which an individual can focus and engage with musical stimuli with relative ease without being distracted. The scale is a Likert scale with ratings from 1-5 (1 being strongly disagree and 5 being strongly agree) that consists of 34 statements such as, "When listening to music, I sometimes temporarily forget where I am," and "When I hear good music I tend to lose my train of thought and forget what I was thinking about." The reliability coefficient for this scale is Cronbach Alpha .92, which characterizes a high internal consistency of the scale, and the test-retest reliability is .86 (Sandstrom & Russo, 2013). Participants will complete basic demographic information to report gender identity, years of experience being a musician, primary instrument, etc. (See Appendix C).

CHAPTER 3

PROCEDURE

Pre-Experimental Setup

Before the experiment, the researcher had to set up the psychology lab in a way that was conducive for the experiment. There needed to be a table for the set up, with all the materials prepared and ready. To begin, the table was positioned in the center of the room to create enough space for the participant and the researcher. Then one chair was placed on the opposite side of where the researcher would be to create a comfortable environment. Next, the fully charged MacBook Air laptop computer was placed on the table in the lab facing away from the participant so they could not see what was on the computer. The web browser, "Safari," was opened on the laptop to load the YouTube video so it was ready to play if necessary. Next, the music files were opened and loaded from Dropbox so that the music was ready for listening by the participant, which was indicated by the participant number. Every third participant starting from participant one listened to the sad piece of music (1, 4, 7, etc.), and every third participant starting from participant two listened to the happy piece of music (2, 5, 8, etc.), and every third participant starting from participant three listened to the crowd of people talking (3, 6, 9, etc.).

The reason participants were assigned to these conditions in this manner was to easily ensure that each experimental condition was receiving the same amount of participants and to readily know which music to play for each participant. This order was

not incumbent on anything other than when the participant was participating in the study. The volume was then set to 4 bars on the laptop for the sad and happy tracks and at 2 bars for the white noise track prior to the start of the experiment. The white noise track was too loud at 4 bars, which is why the adjustment was made. Once both of those browser windows were open with the music on Dropbox and the YouTube video, the Seinheiser HD 6XX headphones were placed right next to the computer for efficiency. For the last part of the initial set up, an iPhone stopwatch timer application was opened for easy access. The experiment was then ready to begin.

Experiment Procedure

Participants ran through the experiment one at a time, and the most time that was necessary was 30 minutes. When the participant showed up, they were welcomed and asked to sit at the chair across the table to fill out the consent form. After reading and signing the informed consent form, participants were given the Faces Scale to measure their emotional state before the experiment started. It was imperative to tell them before they completed the Faces Scale to answer as truthfully as possible to obtain an accurate emotional state score. As such, they were told that they would not be questioned about why they were feeling a particular way to maintain their privacy and comfort during the study. Then the researcher sat in a chair looking away form the participant to not alter their initial response in any way. After they indicated to the researcher that they were done filling it out, the Faces Scale was collected, and they were assigned a number corresponding to when they participated in the experiment. For instance, the first participant was number one, the second participant was number two and so on. This number was noted right after the first administration of the Faces Scale on the back of the

slip of paper. Then the same Faces Scale response was read by the researcher and if participant was feeling happy or neutral (1-4), they were prompted to watch the YouTube video of the little girl who fell victim to an earthquake.

If the participant was feeling sad prior to the experiment, the YouTube video was not necessary because sadness was already present in the participant, and they would already be experiencing the desired emotion. If the video was going to be played, the researcher left the room and started the stopwatch on the iPhone and waited for two minutes and thirty seconds, and the researcher started the timer after leaving the lab and the door was closed. Leaving the lab gave the participants a chance to react to the video with no external pressure or emotional influence from the researcher. After the two and a half minutes passed, the researcher came back into the lab and set up the music listening portion of the experiment with little to no interaction. Participants were told they would listen to an audio track. They listened to either sad music, happy music, or the crowd of people conversing, depending on their assigned participant number.

A pair of Seinheisser HD 6XX over-ear headphones was utilized for music listening via a Macbook Air laptop computer. The volume could be adjusted to the participants' preference, though the volume was set to 4 bars for the sad and happy tracks and at 2 bars for the white noise track prior to the start of the experiment. Participants were then asked to fill out the Faces Scale again to measure post emotional state after they listened to the entire audio track. The researcher left the room again and set a timer for two minutes and twenty seconds. A little extra time was added to the timer to allow for participants to complete the faces scale in a lower pressure, private setting as to not

influence their emotional responses. After the timer was up, the researcher returned to the lab.

Lastly, participants completed the Absorption in Music Scale in Qualtrics, along with some demographic questions regarding gender identity, primary instrument, etc. (See Appendix C). Lastly, 28 participants were asked to rate on a scale of 1-7 (7 being extremely sad and 1 being extremely happy) about how they felt when they watched the YouTube video of the little girl for the manipulation check. The impetus for not administering the Faces Scale after the emotional manipulation as the pre-emotional state baseline was because participants who may have felt sad prior to the beginning of the experiment could have potentially felt even worse than they did coming into the experiment after watching the video, and this was considered unethical. Also, if the measurement was completed prior to the experiment, after the emotional manipulation, and after the musical intervention, it would have complicated the analysis unnecessarily. Every participant was thanked for their time and was asked to provide their email if they would like to be entered into a drawing for a chance to win a $10 Starbucks giftcard as compensation for participation in the study. Non-musicians recruited through SONA received course credit for their participation.

CHAPTER 4

RESULTS

Study Design

The design of the current study is a 2 (musicians and non-musicians) x3 (mood congruent, mood incongruent music and white noise) x 2 (pre and post emotional state) between-within design. However, difference scores were obtained for the pre and post emotion scores to better serve the analysis and changed the analysis strategy to a 2x3 between subjects design. An independent samples t-test was used to compare the musical absorption levels of musicians and non- musicians. A one-way ANCOVA was conducted to compare the difference scores of the emotional states of musicians and non-musicians between groups to ascertain the degree to which the sad music (mood-congruent), happy music (incongruent-mood), and white noise (control) facilitated emotional catharsis. The control group served as a baseline for other groups to determine whether different music has a significant effect on facilitation of emotional catharsis.

For context, the scores are based on the Faces Scale mentioned earlier (Andrews & Withey, 1976) in which one is extremely happy and seven is extremely sad, and the difference scores are the post musical intervention emotional state scores minus the pre emotional state scores. This difference score is operationally defined as the extent to which emotional catharsis was experienced. For example, if a participant scored a 4 on the scale before the experiment started and then scored a 2 on the scale after the musical intervention, then the overall difference score would be -2, meaning that they resolved

some, if not all, emotional tension, experienced more emotional catharsis, and felt happier. So if the overall difference score is zero or below, then there was more emotional catharsis experienced because they felt either the same as when they first started the experiment or better, and it is safely assumed that the emotional manipulation provoked a sad response. A Bonferonni adjusted alpha level was used for the post-hoc comparison tests. The resulting alpha for comparisons will be .016 after adjustment.

Again, a total of 72 participants were in the study (N = 72), but a final sample of 68 (N = 68) was used due to missing data in the musical absorption scale (refer to participants section). Henceforth, musicians and non-musicians will be referred to as music majors and non-music majors, respectively and interchangeably.

Hypothesis 1

An independent samples *t* test was conducted to test Hypothesis 1. Hypothesis one states that musicians will possess higher levels of musical absorption than non-musicians. Hypothesis one was supported in that absorption levels were significantly higher among music majors (M = 141, SD = 12.35) than non-music majors (M = 131.8, SD = 17.35); $t(66) = 1.76$, $p <$ .05 (See Figure 2). This supports hypothesis 1 which aligns with previous research suggesting that people who are more involved in the performing arts are more likely to possess higher absorption levels (Garrido & Schubert, 2011; Sandstrom & Russo, 2011). As Parker et al. (2014) and Weinberger (2004) stated in their studies, musicians appear to be more musically predisposed (i.e. higher absorption) for emotional responses to music listening because of increased brain activity in the auditory cortex when listening to music than non-musicians.

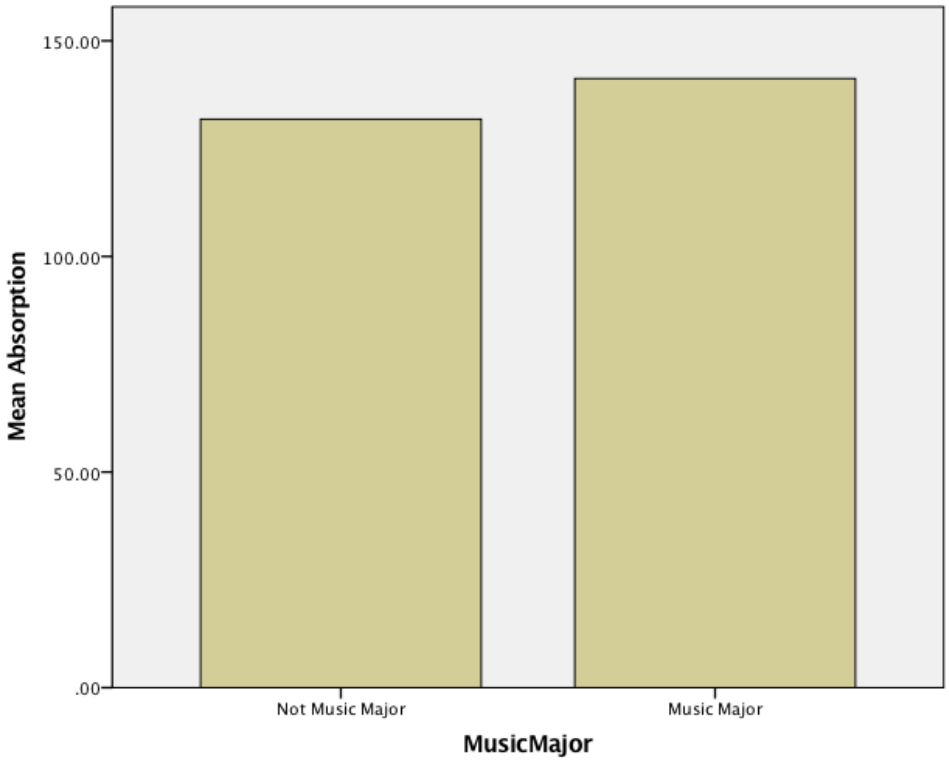

Figure 2. Musical absorption levels in music majors and non-music majors. Absorption levels were significantly different between the groups, but they both still exhibited relatively high levels of musical absorption (170 being the max).

Hypothesis 2

Hypothesis 2 states that musicians will experience more emotional catharsis than non-musicians, regardless of whether the music is congruent or non-congruent with the listener's emotional state. However, it appears that there were no main effects of music major status $F(1, 61) = 1.984$, $p>.05$. Both musicians and non-musicians experienced similar levels of emotional catharsis, after controlling for absorption levels (See Figure 3). This was an unexpected result, but not entirely surprising. According to the data, Hypothesis 2 was not supported.

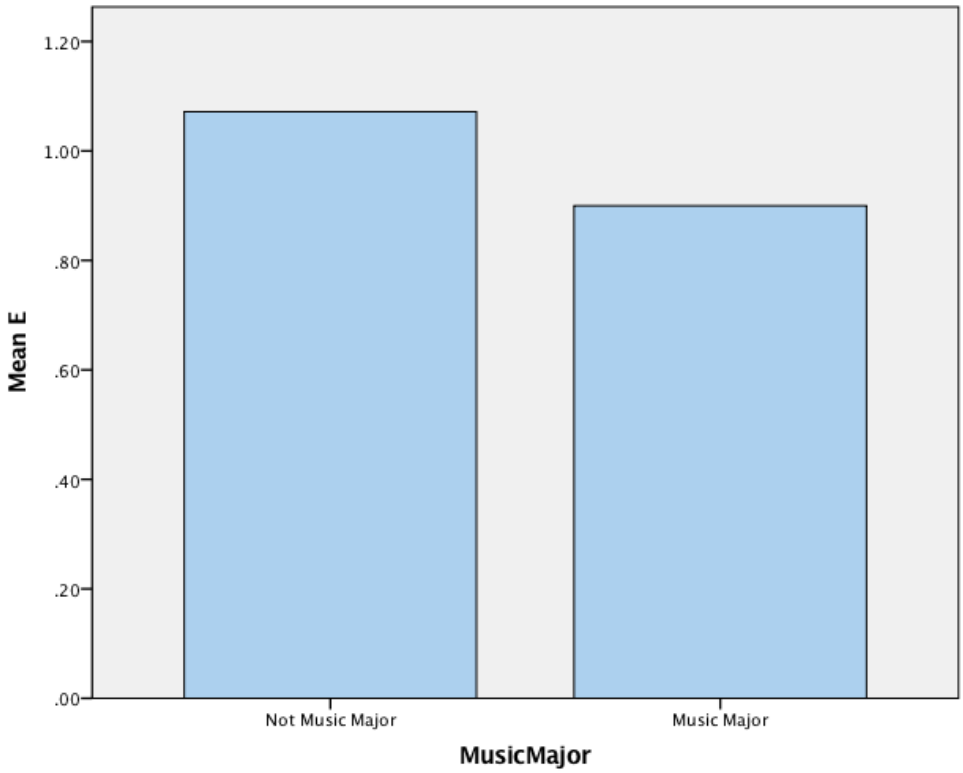

Figure 3. Main effect of music major status (i.e., musician, non-musician) on emotional catharsis. To reiterate, E is defined as the difference score between the post-musical intervention emotional state scores and the pre-experimental emotional state scores, which is the extent to which emotional catharsis occured.

Hypothesis 3

Moreover, hypothesis 3 states that sad music (mood-congruent) will facilitate more emotional catharsis than happy music (incongruent-mood) and white noise (control). There was a significant main effect of music type $F(2, 61) = 12.552$, $p < .05$, thus suggesting that music type does affect emotional catharsis. Participants in the happy music condition ($M = -.078$, $SE = .266$, $p < .001$) seemed to have the strongest effect overall on emotional catharsis compared to the sad music ($M = 1.308$, $SE = .275$, $p > .05$) and control ($M = 1.630$, $SE = .259$, $p > .05$) conditions, which the latter two conditions did not induce a powerful emotional response and made participants feel worse (See

Figure 4). Hypothesis 3 was not supported. However, this does support the idea that happy music (incongruent mood music) does boost mood and promotes emotional catharsis better than sad music.

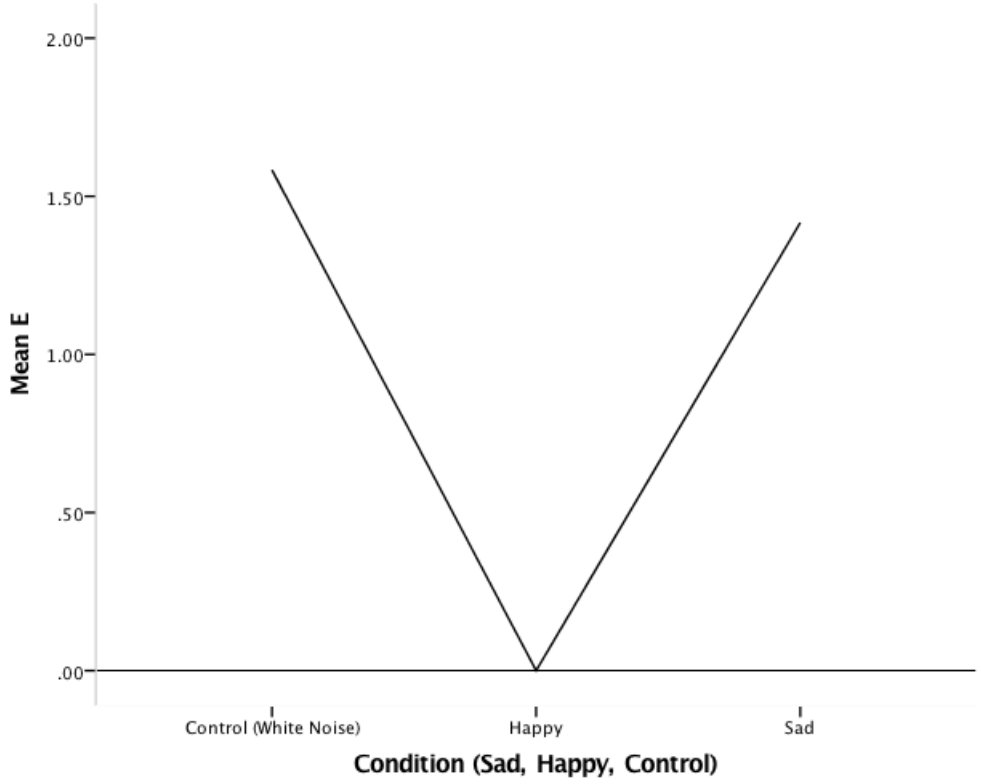

Figure 4. The main effect of music type. Happy music produced a very small negative difference score, meaning that emotional catharsis was experienced, and it was significantly different than the sad and control conditions.

Hypothesis 4

Lastly, hypothesis 4 was that musicians who listen to mood-congruent music (sad) would experience more emotional catharsis than musicians who listen to mood non-congruent music (happy). The interaction effect between music type and music major status was also significant $F(2, 61) = 3.332$, $p < .05$ (See Figure 5). When comparing the emotional response means of music majors and non-music majors when listening to the

different types of music, the interaction was only significant for music majors who listened to sad music (M = .514, SE = .435). The differences between music majors and non-music majors for both the happy and control conditions were not significant $p > .05$. Thus, this provides evidence hypothesis 4. Conversely, the data does suggest that the main mechanism influencing differences in emotional experience between music majors and non-music majors may not be absorption, as this variable was controlled for when running the ANCOVA. There may be other factors contributing to these differences that this study did not examine.

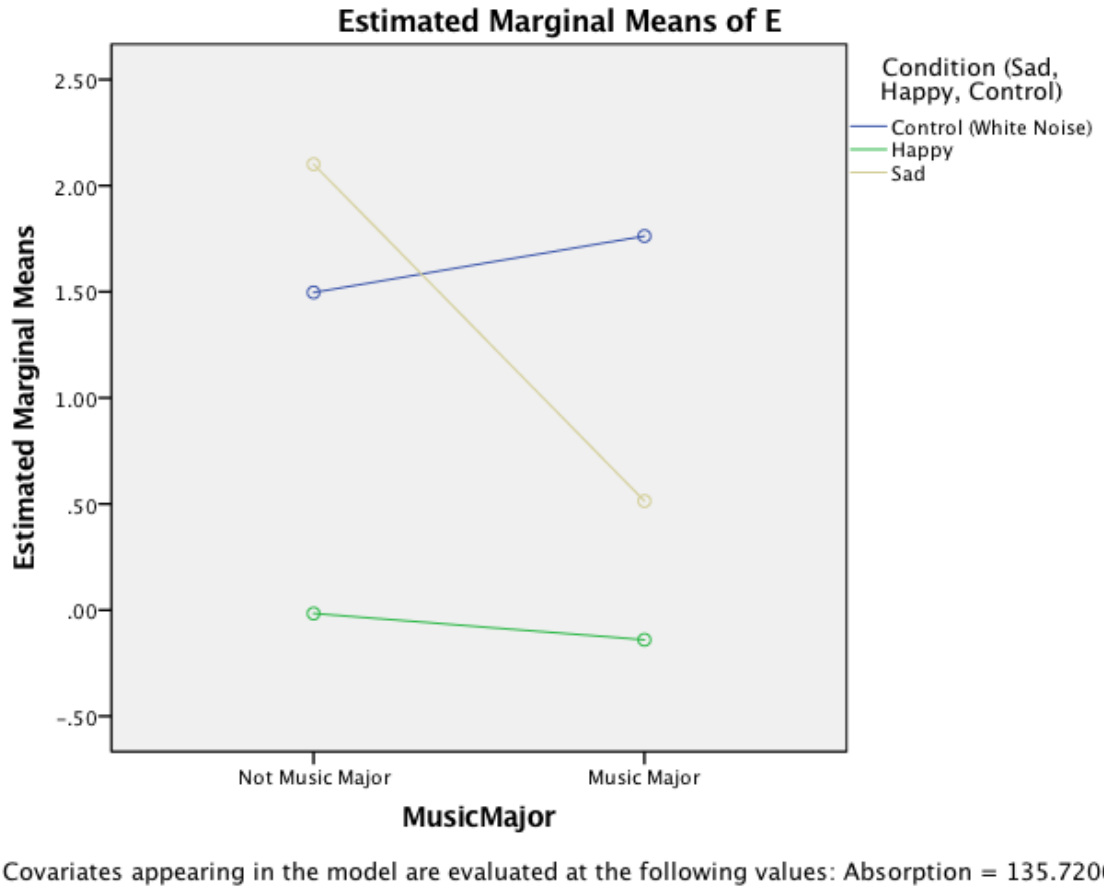

Figure 5. The interaction effect of musician status and music type. There was a significant difference between music majors who listened to sad music than non-musicians who listened to sad music. Still, happy music seemed to be the most effective facilitator of emotional catharsis.

CHAPTER 5

DISCUSSION

Music as a Facilitator of Emotional Catharsis and Limitations of Study

The data herein suggests that music does affect our emotional experiences, depending on the type of music that is listened to and whether someone is a musician or not. Previous research has supported that music can be an effective way to facilitate emotional catharsis and promote psychological well-being (Bat-Rawden, 2010; Croom, 2015; Huron, 2011; Saarikallio & Erkkila, 2007; Sachs, Damasio, & Habibi, 2015), and the present study also provides evidence for this idea. Musicians did experience more emotional catharsis, but only when they listened to sad music. Otherwise, musical absorption did not matter. This was not expected, as prior research has indicated that absorption may be a good predictor of emotional catharsis because the more musical absorption levels one has, the easier one can focus and reflect on the music (Herbert, 2011; Sandstrom & Russo, 2011). There is a possibility that the music used in the experiment may not have resonated with everyone, thereby making it more difficult to focus on the music and therefore making absorption harder to access. The happy music used in the experiment may have resonated better with participants than the sad music, so it is advisable for further research to ask participants how they felt about the music in general and see how the extent of liking a song predicts emotional catharsis.

To potentially mitigate the issue of music's subjective nature, other researchers have had participants pick the songs they know will make them feel a certain emotion (Garrido & Schubert, 2013; Garrido & Schubert, 2015; Hunter, Schellenberg, & Griffith, 2011; Van den Tol & Edwards, 2015). Herbert (2011) mentions that music has virtually infinite possibilities to engage people emotionally in some fashion, implying that there are a myriad of types of music that will not resonate with people. This is very much a possibility and could explain why there were not any significant differences of emotional release between music majors and non-music majors. The music simply did not connect with some participants. On the other hand, the present study did attempt to control for this so if it did have an effect on participants, future research should attempt to control for it even more by having more musicians react to different kinds of music and coding their responses for emotional reactions to use in future studies.

Happy music appeared to have an overall positive effect on emotional catharsis, as participants experienced the most catharsis when listening to happy music, regardless of whether they were a music major or not. This was another unexpected result, but not out of the question since the research is mixed. Sad music was expected to promote the most effective emotional catharsis in this situation. Again, research has posited that listening to sad music can instill an emotional awareness of one's plight and facilitate their emotional journey (Batt-Rawden, 2010) and mood congruent music can be a useful framework for people to project their own feelings and experiences onto to experience emotional release and produce positive feelings (Saarkallio & Erkkila, 2007).

Furthermore, homeostatic balance can be achieved by relieving the emotional tension that has been built up inside one's mind. Listening to sad music can produce

pleasure because homeostatic imbalance was present in the individual at the time of listening (Sachs et al., 2015), and if individuals don't perceive sad music as pleasurable, there may have not been any homeostatic imbalance or perhaps the music did not fix the imbalance (Sachs et al., 2015). There are a couple of possibilities of why sad music did not promote emotional catharsis overall. Some participants may not have felt sadness before listening to the music because the YouTube video did not provoke enough sadness, so there was no homeostatic imbalance prior to music listening. The manipulation check and the corresponding paired samples *t* test did show a significant provocation of a sad response to the YouTube video, but it may have not been enough for some. The present study only measured 28 participants' emotional reaction to the YouTube video because this was merely to test if the video was inducing sadness. The paired samples *t*-test compared the video reaction scores to the pre experimental emotional state scores.

The Emotional Manipulation

The reasoning for not measuring participants' emotional reactions to the video immediately after viewing and not using those scores as the pre-emotional state scores was to reduce social desirability and to further mitigate the issue of participants reporting and figuring out how they should be feeling instead of how they were actually feeling. The pre-emotional state scores were measured prior to the start of the experiment and the post was measured after the music to help prevent this issue. If participants had completed the Faces Scale right after the video instead, their responses could have potentially been more biased because they would likely be more cognizant that the video was supposed to induce sadness and if they reported feeling happy, this would decrease

their social desirability, therefore influencing participants to report sadness, even if they were not genuinely feeling sad. The video reaction scores were measured during the musical absorption scale portion of the experiment, and participants were told that their responses would be anonymous to prevent less accurate readings of their emotions.

Lastly, the time lapse between watching the video and reporting the emotional reaction to the video was around 10-15 minutes, so participants were more than likely to remember how they felt after viewing the video and helped decrease social desirability. Simply put, there was no easy or guaranteed way to ensure that participants were reporting their genuine emotional responses to the music and the video, but this issue was mitigated as best as possible. The present study only tested one video so future studies may need to test different types of videos with participants to discern which video induces sadness most effectively without being too emotionally intense. Moreover, future studies could focus on finding other effective ways to manipulate people's emotions without it feeling heavy-handed and to reduce the probability of reporting false emotional states.

Music Listening Discussion

As mentioned, the evidence suggests that homeostatic balance and psychological well-being was better achieved when music majors listened to the sad music and when music majors and non-music majors listened to happy music, suggesting that there is a mechanism at work here that may be enhancing emotional catharsis among those individuals who actively engage with music on a regular basis that is not known when listening to happy music. This could also suggest that absorption is an important

mechanism for emotional catharsis but only when the music is mood-congruent for musicians.

One variable that was kept consistent and may explain some of these differences is the duration of the music. In the present study, the tracks were all about 2 minutes long. Previous research has not controlled for time duration of the songs used in their experiments. Most people do not just listen to one song and move on to the next activity. Many people who go to concerts may listen to a set of 20 songs or more. Some concerts have one piece that is over an hour long. People who listen to their music at home or in their car are more than likely to listen to more than one song at a time. Studies that aim to expand on this research should consider creating a more realistic music listening practice than the one used in the current study. For example, instead of having participants listen to only one sad track, have them listen to a few sad tracks in a row. This will provide more possibilities to engage with the music and more plausibility that the music will resonate with them and facilitate emotional catharsis.

As previously stated, the happy music seemed to be one of the most effective ways to facilitate emotional catharsis, relieving emotional tension, thereby enhancing psychological well-being. There may be an alternative explanation to this. Happy music may only be a temporary emotional fix to override the sad feelings and boost one's mood. Participants who listened to the sad music could have possibly not experienced enough emotional catharsis or may have not spent enough time with the music to truly experience the sadness and relieve the emotional tension. In the present study, they were only listening to music for about 2 minutes and then their emotional response to it was recorded immediately afterwards. Long-term effects and measurements of emotional

catharsis and further study are necessary to examine how music duration affects the responses to happy and sad music and to see if similar trends persist after a longer period of time.

Concluding Thoughts

The present study provides evidence that music can change us and help us emotionally and psychologically. Music is so universal and accessible that it necessitates more research because of its utility. Virtually every culture in the world uses music in some regard, so the importance of gaining empirical knowledge of its effects on human emotions is critical to our success in life. As a society, we generally accept that music is very moving and powerful, and this study provides evidence for this. Alas, we continue to contradict ourselves and devalue its importance in a macro sense. Music programs are commonly perceived as an unsteady profession and are cut from schools if budget cuts are an issue without giving careful consideration because other essential subjects like math and science are more practical and important. These subjects are certainly important, and they can be just as important as music programs, but music programs should be regarded on the same level. There should be a healthy debate as to what is best for the school, its faculty and the student body instead of assuming that, as important as music is, it needs to be terminated first because it is not as critical or sensible to students. Also, many musicians struggle to find a steady job because society does not provide a sufficient infrastructure in which musicians, especially performers, can thrive. Hopefully this research can change the way music is perceived on a macro level and reinforce its importance for people to support the music programs in schools across the nation and musicians' livelihoods.

APPENDIX A

LINK TO YOUTUBE VIDEO

https://www.youtube.com/watch?v=Qmsh7k4z4Y0

APPENDIX B

ANAGRAM TASK

Anagram Task

Each group of letters provided can create a word. For example, if you see lefa, the word you can spell is leaf. Please write each answer on the lines provided. There is only one solution per group. When finished, please let the researcher know.

1. onapr _____
2. adebl _____
3. neibr _____
4. itruf _____
5. retiv _____
6. zltwa _____
7. plimb _____
8. ownlc _____
9. htmon _____
10. ongya _____

APPENDIX C

ABSORPTION IN MUSIC SCALE

Q1 I sometimes move my hand as if I were 'conducting' music

- ○ Strongly Disagree
- ○ Somewhat Disagree
- ○ Neutral (Neither Agree or Disagree)
- ○ Somewhat Agree
- ○ Strongly Agree

Q2 When listening to music, I sometimes temporarily forget where I am

- ○ Strongly Disagree
- ○ Somewhat Disagree
- ○ Neither Agree nor Disagree
- ○ Somewhat Agree
- ○ Strongly Agree

Q3 I sometimes feel like I am 'one' with the music

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q4 When I listen to music I can get so caught up in it that I don't notice anything

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q5 When I feel nobody understands me, I often turn on some music

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q6 I will stop everything that I'm doing in order to listen to a special song/piece of music that is playing

- ○ Strongly Disagree
- ○ Somewhat Disagree
- ○ Neither Agree nor Disagree
- ○ Somewhat Agree
- ○ Strongly Agree

Q7 I can imagine a song/piece of music so vividly that it holds my attention as if I were hearing it live

- ○ Strongly Disagree
- ○ Somewhat Disagree
- ○ Neither Agree nor Disagree
- ○ Somewhat Agree
- ○ Strongly Agree

Q8 When I hear good music I tend to lose my train of thought and forget what I was thinking about

- ○ Strongly Disagree
- ○ Somewhat Disagree
- ○ Neither Agree nor Disagree
- ○ Somewhat Agree
- ○ Strongly Agree

Q9 Sometimes when listening to music I feel as if my mind can understand the whole world

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q10 I sometimes feel that I understand the songwriter/composer's intentions completely

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q11 I can change almost any sound into music by the way I listen to it

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q12 I have stopped walking to listen to music that I came across on my path

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q13 While listening to music, I may become so involved that I may forget about myself and my surroundings

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q14 If I want to feel creative, I will turn on some music

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q15 It is sometimes possible for me to be completely immersed in music and to feel as if my whole state of consciousness has been temporarily altered

- ○ Strongly Disagree
- ○ Somewhat Disagree
- ○ Neither Agree nor Disagree
- ○ Somewhat Agree
- ○ Strongly Agree

Q16 I know what people mean when they talk about mind-altering musical experiences

- ○ Strongly Disagree
- ○ Somewhat Disagree
- ○ Neither Agree nor Disagree
- ○ Somewhat Agree
- ○ Strongly Agree

Q17 At times when listening to music, I feel more connected with other people

- ○ Strongly Disagree
- ○ Somewhat Disagree
- ○ Neither Agree nor Disagree
- ○ Somewhat Agree
- ○ Strongly Agree

Q18 I find that different sounds have different colors (e.g., red, blue)

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q19 I spend as much time as I can every day listening to music

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q20 Sometimes music can make me feel and experience things as I did when I was a child

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q21 Sometimes I almost feel as if a song was written especially for/about me

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q22 I sometimes make my movements/actions (opening doors, pushing buttons, stepping off curbs) coincide with the music

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q23 I like to find patterns in everyday sounds

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q24 When listening to music I can lose all sense of time

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q25 Before I do an activity (e.g., exercise, study), I usually carefully consider what music to play along with it

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q26 The sound of a speaking voice can be so fascinating to me that I can just go on listening to it

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q27 Music sometimes helps me 'step outside' my usual self and experience an entirely different state of being

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q28 When listening to music, I often imagine the musicians playing the songs

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q29 When listening to great music I sometimes feel as if I am being lifted into the air

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q30 When I am listening to music, I can tune out everything else

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q31 I sometimes see vivid images in my head when I listen to music

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q32 I sometimes close my eyes so I can focus on the music I am listening to

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q33 There are times when I will do nothing except listen to music

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q34 I sometimes feel like I'm part of something bigger than myself when listening to music

- Strongly Disagree
- Somewhat Disagree
- Neither Agree nor Disagree
- Somewhat Agree
- Strongly Agree

Q35 During the experiment, you may have watched a YouTube video about a little girl who was trapped under fallen debris from a natural disaster. On a scale of 1-7 (1 being very happy, 4 being neutral, and 7 being very sad), how did this video make you feel? Please be as honest as possible. Your response will be anonymous.

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ 7
- ○ I did not watch the video

Q36 Are you a music major at California State University, Fullerton? If no, skip the next question.

- ○ Yes
- ○ No

Q37 If yes to previous question, what is your primary instrument and how long have you been playing?

_____

Q38 If you are not a music major at CSUF, what musical activities do you do, if anything? How often do you engage in these other musical activities like listening to

music, going to concerts, etc. that do not involve you performing or playing music yourself?

_____

Q39 What gender do you identify with most?

_____

APPENDIX D

THE EXPERIMENTAL SCRIPT

Music, Emotion Regulation and Catharsis Study Script

Researcher: Hello. Are you here for the study on music? (If yes, take them into lab) Alright, go ahead and have a seat here (show them the seat by the table and hand them the consent form)
So here is a consent form. Go ahead and read it over. It basically explains the various things you'll be doing in the experiment as well as some information about what the study is about. Once you are done, please sign at the bottom of the last page. If you have any questions while reading it, please feel free to ask me for clarification.

Once they are done with the consent form, say:

Ok so let's go ahead and get started. Here is a scale I'd like you to complete (hand them Faces Scale). What I would like you to do is indicate which face on this paper best indicates your overall emotional state. Please try to be as honest as possible. You will not be questioned about why you are feeling a particular way so we can maintain your privacy and comfort during the study. Once you have filled it out, flip it over and let me know that you are done.

Take a moment to look at their response. If participant indicates they are feeling sad (A-C on Faces Scale) then

- **Do not play the video for them. Go straight to the music listening portion of the experiment.**

If neutrality or happiness (D-G) is indicated, then go ahead to the video portion of the script.

- **Also, label the first Faces Scale on the back with a number that corresponds to the order in which the participant is in the study. This means if they are the 5th participant in the study, they will be participant #5.**

If video needs to be played:

Ok, so I am going to have you watch a video. The video is about 2 and a half minutes long. I'm going to leave the room for a few minutes, but I'll be back shortly so please stay seated until I get back. If for any reason you would like to not view the whole video because of its sensitive nature, you have the right to cease participation at any time. Once I leave and the door closes, press play on the video. I'll be back soon **(Once you are out of the room, set a stopwatch/timer for 2 minutes and 30 seconds. When it hits 2 minutes and 25 seconds, go back into the lab)**

If video does not need to be played, go straight to this part:
Ok, so now I'll have you listen to an audio track (Put cursor right over the play button). You will be using these headphones and you can adjust the volume on the computer using these buttons (show participant the volume adjustments and how to change it). Once the track ends, please fill out this Faces Scale. Once you fill it out, please turn the paper over. I am going to leave the room again to make sure I have my other materials for the rest of the experiment, so please stay in your seat until I come back. Go ahead and put the headphones on and then press play when the door shuts. Alright, I'll be back.

- **Set the timer for 2 minutes and 20 seconds and head back into lab after this time is up**
- **Once back in lab, label the Faces Scale again with the same number you did on the first one and then move on to anagram/distracter task:**

Alright for this part of the experiment, you will be doing an anagram task. There will be groups of letters presented on the page, and you have to figure out what each group of words spell. There is only one solution for every group of letters. Please write the solutions on the lines provided. Take as much time as you need. If there is a solution you can't seem to figure out, that is ok. Do the best you can and once you have done as many as you can, let me know, and we can move on to the last part of the experiment. Alright, go ahead and get started. **(Please just read or do something quiet while participant is doing this. Make sure you are not sitting directly towards them.)**

When participant has finished anagram task, direct them to the lab computer with the musical absorption survey.

For the last part of the experiment, you will complete some demographic information and a survey with a series of questions about your experience with music. For each statement, there will be a range of answers from, "Strongly Disagree" to "Strongly Agree." Simply click on the bubble that best describes your experience. This may take about 10-15 minutes, but you can take as much time as you need to complete it. If you have any questions, let me know. If for any reason you feel uncomfortable answering some questions, you can skip them and continue with the rest of the survey. Go ahead and begin the survey.

After participant is done with the survey, they have completed the study. Now you say (This does not have to be verbatim as it won't affect any outcomes of the results):

You are done with the study. Thank you so much for participating. Just keep in mind to not tell anyone what you did today in the lab to maintain the integrity and reliability of the study. I will notify you via email if you win one of the five $10 Starbucks gift cards after the study is complete. Have a great day!

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