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Silver Linings Playlist: Exploring the Effectiveness of Music as an Emotion Regulation Tool

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SILVER LININGS PLAYLIST: EXPLORING THE EFFECTIVENESS OF MUSIC AS AN EMOTION REGULATION TOOL

by

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(Under the Direction of Jeff Klibert)

ABSTRACT

Music not only entertains listeners, but it also evokes emotions and facilitates emotion regulation (Gabrielsson, 2001; Krahe & Bienick, 2012). Specifically, music helps listeners to express their emotions and alter their mood through cognitive reappraisal (Chin & Rickard, 2014; Witvliet & Vrana, 2007). Listening to music also enhances relaxation and reduces physiological arousal after experiencing a stressful event (Yehuda, 2011). Stress often involves an influx of negative emotions, which when left unmitigated, may result in fewer positive emotions, increased depression, and maladaptive coping (Flynn & Rudolph, 2010; Lazenby et al., 2019). While music appears to be an effective stress management tool, less is known about how music impacts positive and negative emotions in the context of stressors. Thus, the current study examined the ability of different kinds of music interventions to reduce negative emotions and increase positive emotions after a stressful event. The study was conducted in two phases using undergraduate samples. Seven hundred and ninety-five students completed a music preferences questionnaire during Phase 1. During Phase 2, 63 students who participated in Phase 1 were randomly assigned to one of three conditions (Empowering Music, Calming Music, Control Group) following a stress induction task. Measures of positive and negative emotions and stress levels were administered three times during the experiment. A series of 3 (Time [Time 1, Time 2, Time 3]) x 3 (Condition [Control Task, Calming Music, Empowering Music]) factorial

ANOVAs were used to determine the impact of the music interventions on positive and negative emotion scores. Regarding positive emotions, results revealed a significant Time x Condition interaction effect, where individuals in the Empowering Music group reported greater positive emotions compared to those in the control group. Results revealed a significant Time x Condition interaction effect for negative emotions as well. However, there were some methodological concerns which prevented me from clearly interpreting these findings. Results also revealed a significant main effect for condition at Time 3 stress scores, where individuals in both music intervention conditions reported significantly lower stress scores compared to those in the control group. These findings highlight the benefits of using empowering music to build positive emotions, which may help individuals find well-being, even in the face of moderately distressing events.

INDEX WORDS: Music, Music preferences, Emotion regulation, Emotional states, Stress

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CHAPTER 1

INTRODUCTION

Emotions permeate human existence, giving meaning to experiences and adding color to the canvas of life. Although emotions are commonly known for eliciting valenced states (i.e., subjective feelings of pleasantness or unpleasantness), they also serve a variety of other purposes (Shuman et al., 2013). Emotions facilitate decision-making, preparation for action, interpersonal responsiveness, and enhanced perceptions of social cues (Gross, 2015). Research suggests emotions are adaptive responses to environmental stimuli and that these responses may be behavioral or physiological in nature (Gross, 1998a). *Emotions* differ from moods in that they are relatively short-lived and acute whereas *moods* are longer in duration and often less intense (Juslin & Västfjäll, 2008). Additionally, emotions are usually triggered by specific stimuli, which in turn leads to behavioral responses. Due to their extended nature, moods typically involve more cognitive action than behavioral expression (Gross, 2015). Moreover, emotions and moods both fall under a broader category known as *affect*. Affect is a general term for positive or negative psychological states (Juslin & Västfjäll, 2008). Likewise, emotions are generally divided into categories based on their positive or negative characteristics. Carver and Scheier's (1990) *control-process theory* proposes that positive and negative emotions may be differentiated by the realization of goal-directed progress.

According to Carver and Scheier (1990), a faster-than-expected rate of movement toward a goal results in positive emotions. Positive emotions are described as pleasant in affect and encompass an array of auxiliary emotions such as joy, interest, satisfaction, love, and happiness (Quoidbach et al., 2015). These emotions serve many purposes, including inspiring creativity, counterbalancing negative emotions, fostering empathy, and expanding attentional resources

(Goodman, Doorley, & Kashdan, 2018; Quoidbach, Mikolajczak, & Gross, 2015). One important potential purpose of positive emotions is explained by the *broaden-and-build theory*. This theory suggests that positive emotions widen individuals' range of possible thoughts and behaviors, thereby allowing people to pursue constructive actions like exploring and innovating (Frederickson, 1998). Furthermore, some researchers posit that positive emotions serve a *hedonic* (i.e., to feel pleasure) purpose (Shweder, Haidt, Horton, & Joseph, 2008; Tamir, Mitchell, & Gross, 2008). Although research focuses more on the implications of negative emotions with psychopathology, positive emotions cannot be excluded. Specifically, a lack of positive emotions is found in depression and antisocial personality disorder, whereas an overabundance of positive emotions is present in symptoms of bipolar disorder (i.e., mania, euphoria; Frederickson, 1998).

Although large shifts in positive emotions have some adverse effects, research suggests the implications of negative emotions may still be greater. Negative emotions are usually labelled as unpleasant and include feelings such as sadness, anger, guilt, disgust, and regret. The *control-process theory* states that negative emotions are the result of a slower-than-expected rate of movement toward a goal (Carver & Scheier, 1990). There is a preponderance of research which suggests negative emotions may be more influential than positive emotions regarding different behavioral outcomes. For instance, emotion research indicates there are more techniques for avoiding negative emotions than for inducing positive ones (Baumeister et al., 2001). Likewise, negative emotions (i.e., bad moods) produce more thorough information processing (Bless, Hamilton, & Mackie, 1992) and distressing events are remembered more often than positive events (D'Argembeau & Van der Linden, 2005; Baumeister et al., 2001). However, negative emotions serve a variety of adaptive purposes when they occur in moderation. For example, fear can be functional when it prevents physical harm (Öhman, 2008).

Feelings of guilt promote interpersonal functioning (e.g., apologizing when one has transgressed; Baumeister, Stillwell, & Heatheron, 1994) and the expression of anger predicts improvements in chronic pain control (Graham, Lobel, Glass, Lokshina, 2008). Negative emotions become a hindrance when their intensity, frequency, or duration is maladaptive for a given context (Aldao & Nolen, 2011). For example, fear with an extended duration may result in a specific phobia and frequent bouts of anger can precipitate intermittent explosive disorder (Gross & Jazaieri, 2014). Due to the considerable influence of positive and negative emotions, it is important to explore mechanisms which promote effective regulation.

Emotion Regulation

People can choose how and when they express emotions. This ability to modify emotional expression is known as *emotion regulation* (ER). ER is a complex process with myriad strategies associated with it. Strategies include increasing positive emotions, decreasing negative emotions, restricting emotional intensity, extending emotional duration, and altering the quality of emotions, among others (Gross, 2015). Although there are many approaches to ER, most are focused on minimizing *dysregulation* (i.e., the inability or difficulty regulating one's emotions; Cole et al., 1994). Difficulties regulating emotions are associated with a host of clinical symptoms (e.g., binge eating, alcohol use) and mental health disorders (e.g., anxiety and mood disorders; Aldao et al., 2015; Gross, 1998b; Sheppes et al., 2015). Moreover, ER programs and interventions are effective in alleviating different types of distress (Aldao & Nolen, 2011; Gross & Jazaieri, 2014). Given the consequences of emotion dysregulation, there is a need to identify factors which concurrently promote functional ER processes, those that upregulate (i.e., increase) positive emotions and downregulate (i.e., decrease) negative emotions.

Music

One factor that may facilitate ER is music. Music possesses highly emotive properties, such as generating feelings of happiness or sadness and is often selected based on the listener's desire to experience a specific emotion (Corrigall & Schellenberg, 2015; Juslin & Västfjäll, 2008). Since music is widely accessible, low-cost, and can be relevant across cultures (Juslin & Västfjäll, 2008; Saarkallio & Erkkilä, 2007), it is worth exploring as a potential ER mechanism. Music is a valid method for improving mood (Juslin & Västfjäll, 2008; Saarikallio & Erkkilä, 2007), reducing stress (Kenny & Faunce, 2004), and evoking emotion (Corrigall & Schellenberg; Saarikallio, 2012). Further, music possesses a variety of regulatory functions, such as valence-based *emotion induction* (i.e., sad, angry, joyful; Chin & Rickard, 2013; Saarkallio & Erkkilä, 2007), *emotional discharge* (i.e., the release of emotions), and *emotional solace* (i.e., comfort during times of emotional pain; Saarikallio, 2012). Overall, the connection between music and emotion is clearly outlined in the literature, however, much less is known about if and how music helps individuals regulate positive and negative emotions, especially after a stressful event.

Purpose

Broadly, the purpose of this study was to explore music as a potential ER tool. The current study investigated the effects of self-selected music on emotions after a stress induction task. Specifically, the study measured positive and negative emotions scores after a social rejection stress induction task for two intervention groups (empowering music and calming music) and one control group. The study aimed to answer the following questions:

1. Does listening to self-selected empowering music increase positive emotions and decrease negative emotions after a stressful experience?

2. Does listening to self-selected calming music increase positive emotions and decrease negative emotions after a stressful experience?
3. Is there a differentiated effect (empowering vs. calming) for type of self-selected musical group on changes in positive and negative emotion scores?

Significance

ER difficulties are associated with a wide range of disorders in the Diagnostic and Statistical Manual of Mental Health Disorders-Fifth Edition (DSM-5). Although these struggles are pervasive, ER skills can be learned and adapted to become more effective (Aldao & Nolen, 2011). Psychotherapy and counseling services are invaluable in helping individuals better regulate their emotions, however, these services are not available to everyone. Specifically, individuals with limited financial resources may face barriers to seeking treatment. Additionally, due to the scarcity of mental health professionals in rural areas, these populations may not have access to psychological services due to distance (Smalley, Warren, Rainer, 2012). Finally, certain societal and cultural stigmas may prevent individuals from seeking mental health services despite their availability (Han & Pong, 2015). As such, it is worthwhile to explore other mechanisms to promote ER. Music may be one such mechanism. Music is both affordable and accessible; it soothes anxiety, inspires creativity, and lifts moods (Kenny & Faunce, 2004; Saarikallio, 2008; Saarikallio, 2012). There is a large body of research which speculates on the ER capabilities of music. Yet, little is known about how specific music genres and preference levels affect emotion, specifically after stressful experiences. In learning more about which characteristics of music are most effective in regulating emotions, clinicians may be able to offer a low-cost, usable tool to facilitate effective ER. Hence, the current study possesses the

capability to reach vast populations of individuals who may otherwise be unable to obtain services to bolster ER skills.

Definition of Terms

1. **Emotions:** Emotions are affective response tendencies toward events or stimuli (Gross, 1998b). Gross (1998a) suggested emotions are both subjective and brief. Additionally, emotions can be linked to specific precipitating factors and are followed by targeted behavioral responses. Although emotions are similar to moods, moods are longer in duration, lower in intensity, and more ambiguous with regard to etiology (Juslin & Västfjäll, 2008). In the current study, positive and negative emotions will serve as the dependent variables.
2. **Emotion Regulation:** ER is defined as any attempt to alter the emotion generation process (Gross & Jazaeiri, 2014). This can involve the modification of an emotion's intensity, duration, or frequency. Furthermore, ER incorporates various strategies, such as the upregulation of positive emotions and the downregulation of negative emotions. Difficulties in effectively regulating one's emotions is referred to as *emotion dysregulation*.
3. **Valence:** Valence is defined as the subjective level of pleasantness or unpleasantness (Corrigall & Schellenberg, 2015; Shuman, Sander, & Sherer, 2013). In the music literature, valence is more specifically defined as musical positivity and a song can be either negatively or positively valenced (Sandstrom & Russo, 2010).
4. **Energy:** Within musical research, energy is defined as the overall intensity or arousal-capabilities of music (Corrigall & Schellenberg, 2015). Specifically, music may be characterized as having high, low, or moderate energy. Songs with high energy are

described as reviving and exciting whereas low energy songs are described as relaxing and soothing (Rentfrow & Gosling, 2003; Västfjäll, 2002).

5. **Familiarity:** The familiarity of music can be defined by a number of media sources and communication studies designed to measure musical popularity (e.g., Billboard Top 100). For the purposes of this study, music familiarity (i.e., popularity) is defined as songs within the top 100 of their genre as indicated by the Spotify Application Program Interface (API) *Sort Your Music*.
6. **Preference:** Musical preference refers to one's liking of a certain genre or song. Research indicates familiarity increases listeners' preference for music, though the two constructs are distinct (Ali & Peynircioğlu, 2010). The *Sort Your Music* application retrieves data on musical preference based on popularity strictly within the North American region.

CHAPTER 2

LITERATURE REVIEW

Difficulties with stress are quite prevalent in the United States (US) and linked with numerous health consequences. According to a recent survey, approximately three out of four Americans experience a minimum of one clinically debilitative stress-related symptom per month (American Psychological Association [APA], 2017). The debilitative effects of stress are well-supported by research. Physiological effects of stress include elevated cortisol, impaired immune functioning, cardiovascular disease, gastrointestinal tract disorders, overstimulation of the endocrine system, and reductions in brain mass and weight (Yaribeygi et al., 2017). Stress is also associated with a variety of psychological complaints, including reduced cognitive functioning, impaired memory, anxiety problems, depressed mood, and learning difficulties (Lupien, McEwen, Gunnar, & Heim, 2009). Many of the physical and mental effects of stress result in more severe behavioral health outcomes. For example, individuals with elevated stress levels are more likely to engage in drug and alcohol-seeking behavior (McReynolds et al., 2018; Ramchandani et al., 2018). Similarly, stressful events are also linked to increased non-suicidal self-injury (i.e., cutting, burning, hitting oneself; Guerry & Prinstein, 2010). These studies clearly highlight the negative effects of stress on mental and physical health outcomes.

Stress also plays a unique role in the experience and expression of emotions. Lazarus (2006) stated that emotions are evoked when a stimulus is appraised as interfering with goal attainment (e.g., dense traffic prevents someone from being to work on time). An individual's ability or inability to adapt to these interferences (i.e., coping) affects their emotional processes (e.g., the person imagines their boss chastising them for being late and becomes increasingly angry). Stress induces both positive and negative emotions, although, negative emotions are

more common (Folkman & Moskowitz, 2000). Types of negative emotions triggered by stress often include fear (Lupien et al., 2009), anger (Lazarus, 1991), shame (Lazarus, 1991), upset (Lazenby et al., 2019), jealousy (Lazarus, 1991), sadness (Guerry & Prinstein, 2010), and disappointment (Feldman, Cohen, Hamrick, & Lepore, 2004). Moreover, direct encounters with stressors are not always necessary for the evocation of negative emotions. Some research suggests the anticipation of stress also has the same deleterious effects on emotional systems (Feldman et al., 2004; Neubauer et al., 2018).

Stress is linked, not only to an influx of negative emotions (Yamamoto, Naga, Shimizu, 2007), but also to difficulties regulating such emotions (i.e., emotion dysregulation). Interpersonal stress (e.g., social rejection) is particularly linked to dysregulated emotions (e.g., increased and uncontrolled bouts of sadness and hopelessness) associated with depressive symptoms, even more so than other forms of stress (Flynn & Rudolph, 2010; Lazarus, 2006). Moreover, difficulty downregulating negative emotions induced by stress is linked to higher stress reactivity and maladaptive coping mechanisms (i.e., non-suicidal self-injury; Guerry & Prinstein, 2010). Similarly, problems regulating one's emotions in the face of stressors are also linked to greater arousal and difficulties managing one's arousal, which in turn leads to problematic expressions of frustration and aggression (Velotti et al., 2016). Thus, research substantiates the connection between unique types of stress and increases in dysregulated negative emotions.

Debilitative stress-related symptoms are also directly and indirectly (through negative emotions) related to reductions in positive emotions. For instance, stress is directly related to lower levels of positive emotions, including enthusiasm (Lazenby et al., 2019) and vigor (McHugh et al., 2013). In addition, stress indirectly contributes to lower levels of positive

emotions through heightened states of negative emotions. Specifically, an upsurge of negative emotions often results in a reduction in positive emotions (Ong, 2016). The linkages between stress/stress-related processes and lower levels of positive emotions are problematic for numerous reasons. First, positive emotions facilitate recovery from the physiological effects of stress (i.e., increased cardiovascular activity; Folkman & Moskowitz, 2000). Similarly, individuals with reduced positive emotions are at greater risk for diminished immune functioning and acquiring physical illnesses (Denollet et al., 2008), which reinforces barriers to the stress recovery process. Finally, positive emotions boost creativity and broaden the scope by which individuals perceive events (Frederickson, 1998). As such, the lack of positive emotions may obstruct one's ability to find effective solutions and reappraise barriers to solution finding in a manner that blocks stress recovery.

However, stress does not completely block all individuals from positive emotions. In fact, individuals who can upregulate positive emotions in the face of stress are healthier. These individuals report greater resilience to stress and depression (Folkman & Moskowitz, 2000; Frederickson & Levenson, 1998), decreased incidences of cardiovascular disease and inflammation (Kok et al., 2013), and enhanced psychological thriving (Folkman & Moskowitz, 2000; Frederickson, 1998). Therefore, to minimize the effects of stress on different emotion systems, it is important to identify mechanisms that upregulate positive emotions and downregulate negative emotions after a stressful experience.

Regulating Negative Emotions

Due to the subjectively unpleasant nature of negative emotions, most individuals attempt to minimize them whenever possible (Goodman, Doorley, & Kashdan, 2018; Gross, Richards, & John, 2006). Research suggests there are positive mental health outcomes for this action.

Individuals who downregulate negative emotions experience reductions in different clinical symptoms such as depressed mood, anxiety, and disordered eating (Campbell-Sills et al., 2011; Diedrich, Grant, Hofmann, Hiller, & Berking, 2014; Knatz, Braden, & Boutelle, 2015). Techniques which facilitate the downregulation of negative emotions are effective in alleviating distress resulting from various clinical syndromes (Gross et al., 2019). Effective downregulation tactics often include *cognitive reappraisal* (i.e., reinterpretation of emotions and experiences) and *suppression* (i.e., attempts to repress present emotions). Cognitive reappraisal reduces both subjective and behavioral experiences of negative emotions, whereas suppression only limits the behavioral expression of negative emotions (Gross & John, 2003). Research suggests cognitive reappraisal is more efficacious than suppression because it occurs earlier in the emotion response process and more effectively reduces the subjective experience of negative emotions (Gross, 1998b). Moreover, depending on the context by which suppression is activated, suppression-based ER techniques can be associated with decreased well-being and poor social functioning (Gross & John, 2003).

Regulating Positive Emotions

Unlike negative emotions, most individuals seek to upregulate positive emotions (Gross, Richards, & John, 2006). Positive emotions not only feel good, but they also serve a vital function in relation to mental health. Specifically, upregulating positive emotions serves to repair damage caused by negative emotions (Folkman & Moskowitz, 2000). The *undoing hypothesis* suggests positive emotions help restore autonomic functioning to baseline levels after an individual experiences the physiological effects of negative emotions (Frederickson, 1998). Research strongly supports this position. For instance, emotions such as amusement and contentment facilitate faster recovery from negative emotions associated with physiological

arousal (e.g., fear; Frederickson & Levenson, 1998). Moreover, the use of humor counterbalances the effects of negative emotions and is linked to improved well-being, immunity, and cardiovascular functioning (Dowling, Hockenberry, Gregory, 2003; Guiliani, McRae, & Gross, 2008; Taylor, Bagozzi, & Gaither, 2005). In addition to offsetting, positive emotions promote cognitive and attentional processes, which in turn allow for more creative problem-solving during times of stress (Fredrickson, 1998a). The *broaden-and-build theory* of positive emotions indicates these types of emotions facilitate heightened levels of attention and cognition (Fredrickson, 1998a). By increasing attentional processes, positive emotions expand creative thinking and allow for novel thoughts and behavior. Thus, upregulating positive emotions appears to be a key goal in helping individuals thrive, even when they encounter challenging and threatening circumstances.

Dual Processing of Emotion Regulation

One limitation of current ER strategies is that they isolate focus on either upregulating positive emotions or downregulating negative emotions. Some theories suggest positive and negative emotions are not inversely related but that they exist independently (Watson & Clark, 1992). Therefore, strategies with isolated foci on one emotional domain may be incomplete, especially when trying to help individuals overcome and grow from stressful circumstances. Further, positive and negative emotions may be differentially related to stress. Importantly, individuals can experience both negative and positive emotions after a stressful event, though negative emotions occur in greater frequency and intensity (Zautra, Dowd, & Hogan, 2009). However, because both positive and negative emotions are present during stressful encounters, it is possible to regulate with the goal to generate more effective pathways to stress recovery.

Programs that concurrently stimulate effective downregulation of negative emotions and upregulation of positive emotions may provide better outcomes for people seeking to extend their abilities to cope with stress-related symptoms and processes. It is important that these programs consider how to downregulate and upregulate particular emotion domains through cognitive reappraisal and suppression. Cognitive reappraisal involves reassessing a situation or response in order to modify its emotional meaning (Gross, 1998a). Research suggests reappraisal not only inhibits the effect of negative emotions, but that it also boosts the effects of positive emotions (Giuliani et al., 2008; Quoidbach et al., 2015). Another technique, *suppression*, occurs when an individual alters how or when emotions are expressed (Gross, 2002). Suppression successfully regulates the physical expression of emotions (e.g., smiling when one feels like crying), however its effectiveness for regulating emotion is mixed (Aldao et al., 2015; Gross, 1998a). Moving forward, it is important to evaluate the effects of different cognitive appraisal and suppression mechanisms in decreasing negative emotions and increasing positive emotions after a stressful event.

Unfortunately, there are several barriers to developing and implementing functional ER techniques. First, ER is not something that comes naturally to everyone. Improving ER requires learning how and when to use ER strategies. This often occurs in a therapeutic context with a mental health professional (Gross & Jazaeiri, 2014). Unfortunately, therapy remains inaccessible to many due to financial barriers or limited health care coverage. Moreover, individuals in rural areas may lack access to therapeutic services due to extreme distances to the nearest mental health care facility (Smalley et al., 2012). Cultural stigma also prevents some individuals from seeking help outside of their community (Han & Pong, 2015). In sum, a variety of obstacles may impede the acquisition of ER skills. Therefore, it is important to identify cognitive appraisal and

suppression mechanisms that occur regularly and naturally in day-to-day life and determine whether such mechanisms are effective in increasing positive emotions and decreasing negative emotions after a stressful event.

Music as a Regulatory Mechanism

In addition to providing entertainment, music acts as a catalyst for emotions. A variety of studies (i.e., experiments, qualitative interviews, diaries) demonstrate that music listeners not only feel emotions when listening to music but that these emotions tend to be more positive than negative (DeNora, 2000; Juslin & Sloboda, 2001; Juslin & Västfjäll, 2008). Music evokes an extremely wide range of emotions, spanning from melancholy and rage to joy and euphoria (Gabrielsson, 2001). Music also incites physiological responses similar to those aroused by emotions (i.e., temperature elevation, changes in heart rate, skin conductance; Lundqvist et al., 2009). Similarly, music helps listeners express their emotions. Self-report surveys and electromyographic measurements of facial expressions indicate music prompts expressive responses such as smiling, crying, and laughing (Gabrielsson, 2001; Witvliet & Vrana, 2007). There is also research to suggest that music motivates emotion-related actions and behavior. Specifically, uplifting and pleasant music is linked to increased pro-social behavior (i.e., helping others) and decreased aggression (North et al., 2004; Krahe & Bienick, 2012). Clearly, music not only promotes emotion induction, but it also plays a unique role in physiological responses, emotional expression, and goal-directed behavior.

Despite a strong connection between music and emotion, numerous gaps exist in the current literature. For instance, many studies examine emotion generation capabilities of music outside of a stressful context, yet less is known about the quality of emotions elicited by music after a stressful event. Moreover, previous studies address constructs such as listening behavior

(i.e., timing, setting, and frequency of music listening; Chamorro-Premuzic & Furnham, 2007), physiological responses (Gomez & Danuser, 2007), and neuropsychological responses (Berns et al., 2010) in a controlled laboratory setting. These studies usually require participants to listen scrupulously to music, which may require more attentiveness than is typically used in real-life music listening experiences (Corrigall & Schellenberg, 2015). There is also a distinction between perceived vs. felt emotions induced by music. Gabrielsson (2001) suggested perceived emotions are more cognitive whereas felt emotions involve an affective experience. Additional research suggests music may evoke two different kinds of emotions, *aesthetic* (appreciation for music's unique characteristics) and *utilitarian* (i.e., behaviorally adaptive for meeting personal needs; Scherer, 2004). These two types of emotions function differently and likely play differential roles regarding ER. Other research suggests music-induced emotions are less powerful because they are neither predicated nor proceeded by real-life events. In short, music-induced emotions may be perceived as "safer" because they lack real-world consequences (Zentner et al., 2008). Overall, given the limitations of the current literature, more research is needed to comprehensively explain how music affects emotions after a stressful experience.

Regarding ER capacities, not all music is created equal. For instance, listening to ambient music in a shopping mall may not inspire emotions in the same way as intentionally selecting music to soothe the pain of a romantic break-up. Further, listening to music without consideration for purpose, personal relevance, or function will likely reduce meaningful emotional impact. Thus, the emotional effects of music may vary depending on why a person chooses to listen and what type of music they select. Music literature suggests the impact of music as an ER technique is determined by different musical features such as *preference* (i.e.,

personal affinity for a song; Wells & Hakanen, 1991), *valence* (i.e., musical positivity; Huang, Lin, Wu, & Li, 2014), and *energy* (i.e., level of intensity; Juslin & Sloboda, 2010).

Self-selection. The ER effects of music are often dictated by self-selection (Labbe et al., 2007). Self-selected music is chosen by the individual based on specific needs or expectations (Batt-Rawden, 2010; Labbe et al., 2007). Self-selection offers listeners control and autonomy over their listening experience. Moreover, research suggests self-selected music evokes autobiographical memories (Baumgartner, 1992), which makes self-selected music more influential than non-self-selected music with regard to listener emotions (Vuoskoski & Eerola, 2012). For example, those who choose self-selected sad music experience greater feelings of nostalgia, chills, and happiness than with unfamiliar sad music (Weth et al., 2015). Further, individuals who listen to self-selected music after encountering a stressor experience decreased state-level anxiety and anger (Labbe et al., 2007). Although research is limited, a small assembly of studies point to the importance of self-selected music in promoting the ER benefits of musical listening.

*Valenc*e. Valence refers to music's overall level of positivity or pleasantness and demonstrates a unique role in the elicitation of emotions (Huang, Lin, Wu, & Li, 2014). Research indicates valence affects listeners' subjective emotional experiences and physiological responses (which are particularly salient in stress recovery). Happy music (i.e., high valence) is linked to increases in upregulation features including zygomatic activity (i.e., smiling), subjective ratings of happiness, and skin conductance, as well as downregulation features including decreases in sadness and finger temperature (Lundqvist et al., 2009). Furthermore, music described as heroic or empowering (i.e., positive valence) is linked to increases in positive emotions, particularly

inspiration (Koelsch et al., 2019). Taken together, high valence songs likely help individuals to upregulate positive emotions and downregulate negative emotions in the face of stressors.

However, the connection between sad music (i.e., low valence) and emotions is less clear. Self-report studies suggest sad music is related to feelings of sadness and other emotions, like ambivalence (Kawakami et al., 2013), fascination (Kawakami et al., 2013), nostalgia (Vuoskoski et al., 2012), and wonder (Vuoskoski et al., 2012). Furthermore, low valence music with a slow tempo (i.e., sad) is associated with decreased heart rate and lower skin conductance, which suggests it has a calming effect (Krumhansl, 1997). Conversely, low valence music with a fast tempo (i.e., scary) is linked to faster respiration and increased pulse (Krumhansl, 1997). Thus, low affect music may have differential effects on ER and stress recovery depending on the level of musical arousal (i.e., energy; see below). Overall, research suggests high valence music is associated with dual regulation processes (up and downregulation). However, low valence music may only be related to dual regulation processes under unique conditions.

Energy. Musical energy encompasses the intensity and tempo of music (Juslin & Sloboda, 2010). It is more effective in inducing emotions when compared to valence because of the critical relationship between arousal and emotion generation (Gagnon & Peretz, 2003; Gorn, Pham, & Sin, 2001). Arousal often amplifies different types of emotions (Thayer, 1989), like excitement and panic. This position coincides with Thayer's (1989) *arousal-valence theory* wherein emotions are dependent on a person's level of arousal. Importantly, high energy music is positively related to positive emotions (e.g., happiness) and inversely related to negative emotions (e.g., sadness; Fernández-Sotos et al., 2016; Gagnon & Peretz, 2003). Alternatively, low energy music is also related to a number of emotional experiences. For example, low tempo music is linked to increases in calming emotions such as peace (Balkwill & Thompson, 1999) as

well as more pleasant moods overall (Yamamoto, Naga, & Shimizu, 2007). High energy music is associated with increased tension (Van der Zwaag, Westerink, & Van den Broek, 2011) and anger (Fairclough, Van der Zwaag, Spiridon, & Westerink, 2014), which demonstrates an inverse relationship to positive emotions. Musical energy is particularly important in relation to listeners' overall goals for music listening (e.g., to relax; North & Hargreaves, 2000). When the music's energy contradicts a person's motivation for listening, such as high energy music when the listener is trying to relax, the outcome can have an adverse effect on functional ER approaches (Yamamoto, Naga, & Shimizu, 2007). Moreover, this troublesome effect may be compounded during times of stress.

Thus, considering musical valence and energy together may be the best way to formulate optimal ER techniques. During times of stress, music with high valence and high energy might have a motivating, empowering effect on the individual, which would bolster their ability to upregulate positive emotions and down regulate negative emotions. Alternatively, for individuals in a state of stress, music with a moderate level of valence and low energy may be more beneficial in downregulating negative emotions and upregulating unique positive emotions, like calm. However, it is unknown whether these two different musical profiles have a differential impact (one greater than the other) on an individual's ability to upregulate positive emotions and down regulate negative emotions.

Preference and familiarity. Repeated exposure to music affects listeners' liking and preference for songs (Corrigall & Schellenberg, 2015; Ward et al., 2014). Research indicates liking for music exhibits an inverted U-shaped pattern (North & Hargreaves, 2008), where low-moderate exposure facilitates liking and high exposure (i.e., over-familiarity) is linked to lower liking (Schellenberg et al., 2008). Preference for relatively unfamiliar music is supported by the

mere exposure effect, which states people need only be briefly exposed to a stimulus to prefer it (Zajonc, 1980). Additionally, the emotional influence of music is increased by songs that are liked or preferred by listeners (Schäfer & Sedlmeier, 2010). Familiar music is characterized by features such as times played on the radio, media presence, and the Billboard Top 100 chart (Wells & Hakanen, 1991). This exposure to vast audiences suggests many people likely prefer music with which they are more familiar (Berns et al., 2010; Gürgen, 2015). Thus, the familiarity of music should be considered when exploring music's ER capabilities (upregulation of positive emotions and downregulation of negative emotions).

Current Study

The current study aims to explore music as a potential ER mechanism after an emotionally stressful event. Specifically, this study intends to fill several gaps in the literature to provide a low-cost, accessible ER tool to both clinical and non-clinical populations. Currently, music demonstrates considerable potential as a mechanism for ER. Nevertheless, there are several important questions that require answers in order to effectively utilize music as an ER tool. First, does music provide the opportunity to upregulate positive emotions and downregulate negative emotions after a stressful event? Although research indicates music reduces stress (Kenny & Faunce, 2004), more research is needed regarding the effects of music on emotion, especially after a stressful event. Second, what attributes of music (i.e., self-selection, valence, energy, preference, familiarity) best facilitate these ER processes? Specifically, there are two musical formulas that may enhance ER efforts. *Empowering music*, introduced by Elvers and colleagues (2017) as self-selected, high arousal (i.e., high energy), high positivity (i.e., high valence), and highly preferred songs, may be used to motivate and inspire individuals after stressful events. This could lead to the upregulation of positive emotions and the downregulation

of negative emotions. *Calming music* may accomplish the same goal but using a different approach. The calming music formula is comprised of self-selected, low arousal (i.e., low energy), mid-range positivity (i.e., neutral valence), and highly preferred songs, which may help soothe and relax individuals following a stressful experience. Additionally, are there differential effects between empowering music and calming music with regard to different ER outcomes? Research also suggests music preferences may differ based on demographic characteristics (e.g., gender, ethnicity, etc.). It may be valuable to explore how music preferences differ by demographic characteristics to help tailor more effective music interventions for individuals with diverse sociocultural identities.

Consistent with prevailing theory and empirical evidence, this project has three hypotheses:

a) When compared to individuals in the control group, individuals listening to empowering music after a stressful experience are expected to report greater increases in positive emotions and reductions in negative emotions.
b) When compared to individuals in the control group, individuals listening to calming music after a stressful experience are expected to report greater increases in positive emotions and reductions in negative emotions.
c) As an exploratory hypothesis, the researcher will examine whether individuals listening to empowering music will report greater increases in positive emotions and reductions in negative emotions compared to individuals listening to calming music.

CHAPTER 3

METHODOLOGY

Participants

Phase 1. Participants in the current study consisted of undergraduate students enrolled at a large southeastern university. A total of 842 students participated in the study. In terms of inclusionary criteria, participants were required to be 18 years of age, which is the youngest age by which US citizens can provide consent to participate in research activities in the state in which the study took place. In addition, I included inclusionary criteria based on deviant response patterns to ensure data quality. Specifically, to be considered in the final sample, participants needed to complete at least 90% of the survey items. Seven-hundred and ninety-five participants met these data quality criteria and were subsequently included in the final sample.

Participants ranged in age from 18 to 54 and the average age of the sample was 20.17 (SD = 4.24) years. In response to the gender prompt, 578 participants identified as women (68.6%) and 245 identified as men (29.1%). Most participants (*n* = 529) identified as White/Non-Hispanic (62.8%) and 198 identified as African American/Black (23.5%), with the rest identifying as Hispanic/LatinX (*n* = 45, 5.3%), Multiethnic (*n* = 34, 4%), Asian (*n* = 18, 2.1%), Other (*n* = 9, 1.1%), and American Indian/Native American (*n* = 5, 0.6%). Four hundred and eleven participants reported being reared in a rural area (48.8%) and 428 participants reported being reared in a non-rural area (50.8%). Variation in socioeconomic status (SES) was also assessed and 405 participants reported their current financial status as Some Financial Resources (48.1%), 377 as Substantial Financial Resources (44.8%), 31 as Poor/Impoverished (3.7%), and 26 as Affluent/Rich (3.1%). Participants received extra credit for psychology courses as compensation.

Phase 2. Participants who completed Phase 1 of the study and indicated they would like to participate in Phase 2 were invited to participate in the second phase of the study. Data for Phase 2 were collected from a sample of undergraduate students. A total of 71 students participated in Phase 2 of the current study. Participants were required to be at least 18 years old and meet inclusionary criteria. Additional inclusionary criteria required participants to have provided a list of preferred songs during the Phase 1 screener and to complete at least 90% of the survey items. Finally, participants were excluded from the final sample if the researcher noted any concentration/motivational difficulties (i.e., appearing distracted, falling asleep, not following directions) during the implementation of the study. All participants who met these data quality criteria were included in the final sample.

Sixty-three participants were included in the final sample. Eight participants had difficulties with concentration and motivation and were subsequently removed from the sample. Participants' ages ranged from 18 to 40 years and the average age of the sample was 19.46 (SD = 3.13) years. In response to the gender prompt, 51 participants identified as women (71.8%), 17 identified as men (23.9%), and 1 identified as transgender (1.4%). Forty-six participants identified as White/Non-Hispanic (64.8%) and 15 identified as African American (21.1%), with the rest identifying as Hispanic/LatinX (n = 4, 6.2%), Asian (n = 2, 3.1%), Other (n = 2, 3.1%), and American Indian/Native American (n = 1, 1.5%). Thirty-nine participants reported being reared in a rural area (54.9%) and 31 participants reported being reared in a non-rural area (43.7%). In regard to socioeconomic status (SES), 31 described their current SES as "Middle" SES (43.7%), 19 as "Middle-High" SES (26.8%), 15 as "Low-Middle" SES (21.1%), and 5 participants described their current SES as "Low" (7.0%). All participants were randomly assigned to one of three conditions (Empowering Music, Calming Music, and Control). Twenty-

four participants were assigned to the Empowering Music group (33.8%), 24 were assigned to the control group (33.8%), and 23 were assigned to the Calming Music group (32.4%). Participants received a $10 Amazon e-gift card as compensation.

Measures

Demographic Information. In each phase of the study, participants responded to questions regarding their gender, ethnicity, socioeconomic status, college class level, age, sexual identity, and rural status. Rural status was measured by a series of questions asking students about the population size of their hometown.

Phase 1. During Phase 1, participants were asked to complete a series of self-report questionnaires. These questionnaires were designed to evaluate participants' music preferences, listening behaviors, reasons for listening, and relationships with music.

Music Behavior Inventory (MBI). The researcher created the MBI to learn more about participants' listening behavior. Participants responded to 7 items, including hours spent listening to music, listening format, listening environment, vocal preference, music streaming platforms, whether participants play a musical instrument, and hours spent creating music. Response formats include multiple choice, slider scales, and a 4-point Likert-type scale ranging from 1 (*Not at all*) to 4 (*More than 3 hours*). This inventory was administered during Phase 1 to learn more about how and when participants listen to music. A copy of the MBI is located in Appendix A.

Uses of Music Inventory (UOMI; Chamorro-Premuzic & Furnham, 2007). This self-report questionnaire is designed to assess participants' reasons for listening to music. It is comprised of 15 items which are rated on a 5-point Likert-type scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). The measure consists of three domains (i.e., Emotional,

Cognitive, and Background) intended to address implicit uses for music. The UOMI was included in the Phase 1 screener to gather information about participants' reasons for listening to music (e.g., ER, intellectual stimulation, background noise). Internal consistency ranges from acceptable to good: Emotional (α = .78), Cognitive (α = .85), and Background (α = .76; Chamorro-Premuzic & Furnham, 2007). In terms of convergent validity, the UOMI is positively correlated with general intelligence and the personality trait, openness to experience (Chamorro-Premuzic & Furnham, 2007).

Short Test of Music Preferences (STOMP; Rentfrow & Gosling, 2003). The STOMP is a brief measure of music genre preferences. It is made up of 14 music genres: alternative, blues, classical, country, electronica/dance, folk, heavy metal, rap/hip-hop, jazz, pop, religious, rock, soul/funk, and soundtracks. A fifteenth genre, Latin, was added by the researcher for the purposes of this study. Latin music is rooted in *bolero*, *salsa*, and *tango* genres (Aguiar, Costa, & Silla, 2018) and is rising in popularity in the United States (Kennon, 2019). Due to its growing popularity among Billboard Hot 100 charts, the STOMP was adapted to include Latin music as a genre choice.

Genres are grouped into four dimensions: *Intense and Rebellious* (alternative, rock, and heavy metal), *Reflective and Complex* (classical, jazz, blues, folk), *Upbeat and Conventional* (country, pop, religious, soundtracks and theme songs), and *Energetic and Rhythmic* (rap and hip-hop, soul and funk, Latin, dance and electronica). Cronbach's alpha internal consistencies for STOMP domains are as follows: R/C= .76, I/R= .72, E/R= .55, and U/C= .61 (Vella & Mills, 2017). The listener rates their preference using a 7-point Likert-type scale with endpoints at 1 (*Not at All*) and 7 (*A Great Deal*). Higher scores on the STOMP indicate a higher level of genre preference. This measure demonstrates good retest reliability and high internal consistency (α =

.90). Moreover, a confirmatory factor analysis concluded this measure maintains good model fit (Rentfrow & Gosling, 2003). Finally, indices of the STOMP are related to the Big Five personality traits (e.g., extraversion and openness; Rentfrow & Gosling, 2003) and emotion regulation strategies (Cook, Roy, & Welker, 2019), suggesting good construct validity. The STOMP was administered during the Phase 1 screener for the purposes of assessing participants' unique music preferences.

Playlists. Participants received playlists based on their responses to the STOMP. If a participant rated a genre as "Like Very Much" or "Strongly Like," they received a playlist for that genre. Playlists contained 15 songs chosen to represent specific genres based on data from the Spotify streaming app. Songs were selectively chosen by the researcher using specific metrics. Specifically, chosen songs were evaluated based on criteria related to energy (i.e., level of intensity), valence (i.e., musical positiveness), and popularity as determined by the Spotify Application Program Interface (API) *Sort Your Music*. Participants evaluated a range of musical selections for each genre. For each genre playlist, songs were chosen to represent empowering (n = 5), calming (n = 5), and ambiguous (n = 5) features. Empowering songs (high energy, high valence) were defined as those rated on the 50th percentile or above on energy and valence, whereas calming songs (low energy, neutral valence) were defined as those rated lower than the 50th percentile on energy and between the 30th and 70th percentile on valence. Finally, ambiguous songs (neither high nor low on energy or valence) were defined as those rated between the 40th and 60th percentile on energy and between the 35th and 65th percentile on valence. All selected songs were considered popular, rated in the top 100 of each genre.

Participants rated each song on level of familiarity, preference, induced feelings of empowerment (i.e., how empowered does this song make you feel), and induced feelings of calm

(i.e., how calm does this song make you feel). There was also an option for participants to write in up to three songs that were not listed on the genre sample playlist but were designated as a favorite. If participants wrote in any songs, they were asked to rate them on induced feelings of empowerment and induced feelings of calm. A sample of a playlist response options is located in Appendix D.

Phase 2. During Phase 2, participants were asked to complete a series of questionnaires at different points in the procedures. Specifically, participants' scores on positive emotions, negative emotions, and perceptions of stress were measured 3 times across the study. Reports of personality styles and demographic information were also collected at the end of the phase.

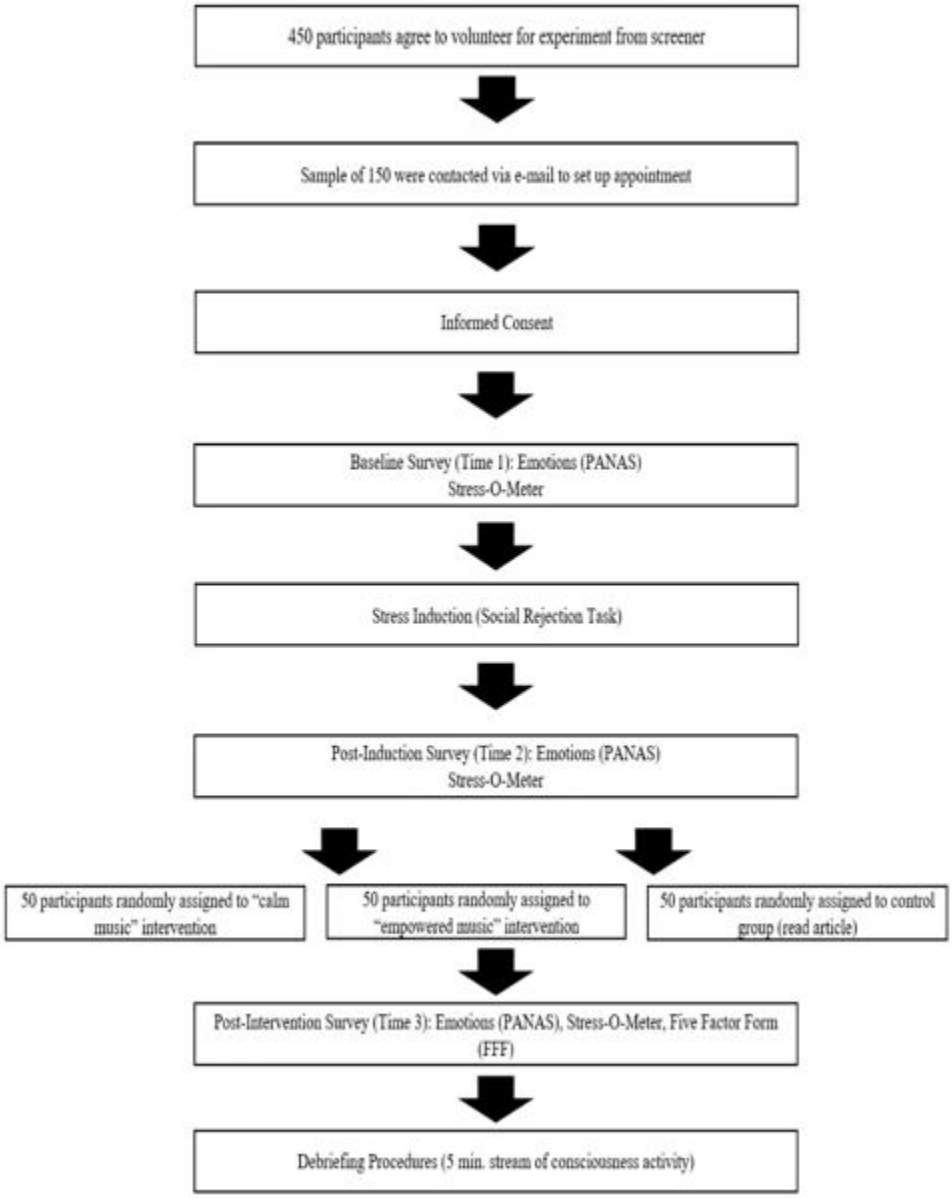
Positive and Negative Affect Schedule (PANAS). The PANAS (Watson, Clark, & Tellegan, 1988) is a 20-item self-report measure designed to assess emotional states. The measure consists of two scales, the Positive Affect Scale and the Negative Affect Scale. Approximately half of the items describe positive emotions and the other half address negative emotions. Each item on the PANAS is measured on a 5-point Likert-type scale ranging from 1 (*Very Slightly or Not at All)* to 5 (*Extremely*). Total scores range from 10-50 for both scales. High scores on the Positive Affect Scale suggest greater feelings of satisfaction and happiness, whereas high scores on the Negative Affect Scale indicate greater feelings of distress and irritability (Watson, Clark, & Tellegan, 1988). Both scales possess excellent construct validity as evidenced by strong correlations with measures of stress, depression, and anxiety (Crawford & Henry, 2004). The PANAS was administered at the beginning of Phase 2 (i.e., baseline), post-stress induction task, and post-intervention. In the current study, both the PANAS-PA (α = .84 to .93) and PANAS-NA (α = .79 to .84) demonstrated excellent internal consistency across different administrations.

Stressometer. The Stressometer (SOM; Keegan et al., 2015) is a one-item measure that ranges from 0 (*No Stress*) to 10 (*Extreme Stress*). The SOM represents individuals' personal evaluations of their current levels of stress. The Stressometer demonstrates good convergent validity with measures of depression, stress, and anxiety (Keegan et al., 2015) and excellent internal consistency ($\alpha = .95$; Vohra et al., 2019). The Stressometer was administered at the beginning of Phase 2 (i.e., baseline), post-stress induction task, and post-intervention.

Procedure

A flow chart of the study procedures is shown in Figure 1. This study had two phases.

Figure 1. Study Procedures Flow Chart



Phase 1

Participants were recruited via an electronic recruitment system, SONA. Students who participated in SONA were asked to visit a webpage listing a large variety of studies. Students

chose to volunteer for studies that appeared interesting to them for course credit. Students who chose this study were directed to a webpage. Once students got to the online webpage, they were asked to read the informed consent document (Appendix C), which outlines major tasks to be completed, risks, and benefits of volunteering to complete this portion of the study. If students agreed to participate in this portion of the study, they were directed to a series of surveys to be completed. Data were collected regarding participants' demographic information, music listening behaviors, preferred genres, and song preferences.

Playlists contained 15 songs chosen to represent specific genres based on data from the Spotify streaming app. Songs were selectively chosen by the researcher using specific metrics. Specifically, chosen songs were evaluated based on criteria related to energy (i.e., level of intensity), valence (i.e., musical positiveness), and preference/familiarity as determined by the Spotify Application Program Interface (API) *Sort Your Music*. Participants evaluated a range of musical selections for each genre. For each genre playlist, songs were chosen to represent empowering (n = 5), calming (n = 5), and ambiguous (n = 5) features. Empowering songs (high energy, high valence) were defined as those rated on the 50th percentile or above on energy and valence, whereas calming songs (low energy, neutral valence) were defined as those rated lower than the 50th percentile on energy and between the 30th and 70th percentile on valence. Finally, ambiguous songs (neither high nor low on energy or valence) were defined as those rated between the 40th and 60th percentile on energy and between the 35th and 65th percentile on valence. All selected songs were considered popular, rated in the top 100 of each genre.

Participants rated each song on level of familiarity, preference, induced feelings of empowerment (i.e., how empowered does this song make you feel), and induced feelings of calm (i.e., how calm does this song make you feel). There was also an option for participants to write

in up to three songs that were not listed on the genre sample playlist but were designated as a favorite. If participants wrote in any songs, they were asked to rate them on induced feelings of empowerment and induced feelings of calm. A playlist response sample is located in Appendix B.

It took participants approximately 50 minutes to complete the surveys. Once the surveys were completed, the participants were given the option to sign up for Phase 2 of the study. Interested participants provided the researcher with their contact information. Finally, students were directed to a debriefing page. The debriefing page offered students free to low-cost resources available to them if participating in the survey was perceived as distressing.

Phase 2

Interested individuals from Phase 1 were contacted via email to determine their willingness to complete the second phase of the study. Once participants indicated interest in participating, they were asked to select a date and time to come into the research laboratory for the experiment. Participants completed Phase 2 in a lab located in the Department of Psychology building on campus. The lab contains a waiting area, which is connected to a room with a table, chair, and desktop computer. Prior to participation in the study, participants were asked to complete and sign a consent form. The consent form explained possible risks and benefits, confidentiality, resource availability, and discontinuation policies associated with participation in this study. The students were asked to read the informed consent form (Appendix D) and sign it to indicate their consent to participate in the study. Once the participants signed the informed consent, they were asked to place their cellphone and other belongings in a secure locker for the duration of the study. They were also prompted to go to the bathroom if needed. Once the participants were situated and ready, they were asked to complete the Positive and Negative

Affect Schedule (PANAS; Watson, Clark, & Tellegan, 1988) and the Stress-O-Meter (Keegan et al., 2015) as a baseline measure of emotions and stress. Next, all participants completed a stress-inducing task based on their experiences with social rejection (see Appendix E).

Social Rejection Stress Induction Activity. For this activity, the researcher provided participants with a computer and instructed them to consider several instances in which they felt rejected. After two minutes, the participants were then instructed to pick one of the listed experiences to focus on during the next part of the task. Participants were asked to write about their chosen rejection experience through a narrative procedure. Specifically, participants were asked to write a 400+ word story. The participants were instructed to write a complete story, one that has a definable beginning, middle, and end. Within their story, participants were instructed to highlight as many details and related emotions as possible.

Once students completed their story, they were asked to complete a post-activity administration of the PANAS and the Stress-O-Meter. Next, participants were immediately randomly assigned to 1 of 3 intervention conditions. The interventions consisted of a control group (Appendix F), empowering music group (Appendix G) and calming music group (Appendix H).

Control Group. Participants in this group read a 5-page digital article about music theory on the lab computer chosen by the researcher. The article was carefully screened to ensure emotional neutrality. The purpose of this control group was to provide participants with a task that was likely to elicit little to no emotional stimulation. Participants were instructed to read mindfully, attend to the details of the article, and complete the article in its entirety. Students were asked to read and re-read the chosen article for 15 minutes.

Empowering Music Group. Before participant arrival, the researcher reviewed each participant's self-selected songs (as noted in the screener). Empowering playlists were constructed by considering each participant's preferred music genre(s) and identified favorite songs within each preferred genre acknowledged in the PMS. Songs were required to be rated by the participant as either "Empowering" or "Very Empowering" to be included in the playlist. Participants received over-the-ear headphones to listen to their playlist. Participants in this group were asked to listen to approximately 15 minutes (between 14 and 16 minutes) of self-selected empowering music. Each participant was asked to mindfully listen to their playlist via the Spotify application. Individuals listened to approximately 3 to 5 songs, lasting between 14- and 16-minutes total. The playlist was cut off at the end of song rather than the middle.

Calming Music Group. Before participant arrival, the researcher reviewed each participant's self-selected songs (as noted in the screener). Calming playlists were constructed by considering each participant's preferred music genre(s) and identified favorite songs within each preferred genre acknowledged in the PMS. Songs were required to be rated by the participant as either "Calming" or "Very Calming" to be included in the playlist. Participants received over-the-ear headphones to listen to their playlist. Participants in this group were asked to listen to approximately 15 minutes (between 14 and 16 minutes) of self-selected empowering music. Each participant was asked to mindfully listen to their playlist via the Spotify application. Individuals listened to approximately 3 to 5 songs, lasting between 14- and 16-minutes total. The playlist was cut off at the end of song rather than the middle.

Once the participants completed their assigned music interventions, they were asked to complete a final series of the PANAS, the Stress-O-Meter, and the Five Factor Form (Widiger, Lynam, Miller, & Oltmanns, 2012). After completion, participants were asked to engage in an

active debriefing process to alleviate any lingering feelings of upset (see Appendix I). This activity included a five-minute stream of consciousness exercise, empirically validated to minimize distress (Wilson & DuFrene, 2009). Participants were also given a debriefing form with free to low-cost resources to access if needed.

Analytic Plan

Data from Phase 1. The analytic plan for the first phase was descriptive. The purpose of this design was to explore how unique subgroups of people differ in their music preferences. During this phase, participants were asked to identify some of their favorite songs from preferred genres. Participants were also asked to evaluate these songs based on musical content (i.e., valence). Of note, this study examined potential demographic differences in music listening behaviors, as well as genre preferences. Demographic and cultural differences in music listening were examined by different gender, race/ethnicity, socioeconomic, and rurality subgroups. To analyze group differences, I ran a series of MANOVAs. MANOVAs reduce the need to run greater amounts of statistical procedures which protect against Type I error. However, because I wanted to evaluate differences across multiple sociodemographic categories, I decided to run a series of MANOVAs which slightly increase the likelihood of family-wise error which can contribute to higher levels of Type I error. In consultation with similar studies, other researchers have acknowledged the risk of running multiple MANOVAs instead of one factorial MANOVA as a means to obtain clearer data in SPSS despite the small risk to increasing Type I error.

Data from Phase 2. Differences in positive and negative emotions scores from baseline to post-induction task were examined as a manipulation check. To accomplish this, a series of repeated measures t-tests were conducted. A significant main effect for time (change from Time 1 to Time 2) on positive and negative emotions was expected. Specifically, it was expected that

positive emotions will decrease and negative emotions will increase after the stress induction task. In terms of main analyses, a series of 3 (Time [Time 1, Time 2, Time 3]) x 3 (Condition [Control Task, Calming Music, Empowering Music]) factorial ANOVAs were conducted to determine variation in positive and negative emotion scores. Specifically, the within-subject effect for Time and between-subject effect of Condition on positive and negative emotion scores were examined. Interaction effects for Time x Condition were also investigated. Since significant interaction effects were present, post-hoc t-tests were run to determine where between-subject differences lie past each time point. A significant interaction for time and group was expected. Specifically, positive and negative emotions were expected to vary across time and between groups, such that the elevations in positive emotion and reductions in negative emotions scores were more pronounced for the Empowering Music Group at Time 3. A similar, weaker effect for participants in the Calming Music Group was expected when compared to the control group at Time 3.

CHAPTER 4

RESULTS

Phase 1: Differences in Music Preferences

In Phase 1 of the study, I evaluated demographic differences in participants' reports of music preferences. Notably, I evaluated whether individuals who reported different gender, ethnicity, rurality, and SES identities varied on reports of music preferences in terms of five different musical themes measured through the STOMP. These musical themes included Reflective/Complex, Upbeat/Conventional, Intense/Rebellious, Energetic/Rhythmic, and Latin preference domains.

Gender Differences. Differences in music preferences were examined between participants who identified as women (n = 578) and participants who identified as men (n = 245). To test for potential differences, a MANOVA was used for analysis. Table 1 depicts the mean and standard deviation scores for musical preferences by gender. Results indicate a significant main effect for gender on music preferences, $F(5,817) = 15.13$, $p < .01$, *partial* $\eta^2 = .09$. Follow-up ANOVAs were analyzed to determine where gender differences were revealed for specific musical preference theme. These findings suggest individuals who self-identified as women reported greater preferences for Upbeat/Conventional music, whereas individuals who self-identified as men reported greater preferences for Reflective/Complex, Intense/Rebellious, Energetic/Rhythmic, and Latin music. The effect size of these differences was moderately small to small.

Table 1.

Means and Standard Deviations for Music Preferences Theme by Gender

Music Preference Theme	Women (n = 578)	Men (n = 245)	F	p	*partial* η^2

Reflective/Complex					
Mean	14.71	16.73	24.69	.01	.03
Standard Deviation	5.35	5.30			
Upbeat/Conventional					
Mean	19.05	17.49	21.59	.01	.03
Standard Deviation	4.33	4.61			
Intense/Rebellious					
Mean	12.34	14.01	21.52	.01	.03
Standard Deviation	4.74	4.68			
Energetic/Rhythmic					
Mean	13.69	14.62	13.56	.01	.02
Standard Deviation	3.32	3.37			
Latin					
Mean	3.51	3.83	5.39	.01	.01
Standard Deviation	1.81	1.70			

Note. This table depicts the means and standard deviations for music preferences by gender.

Race/Ethnicity Differences. Differences in music preferences were examined between participants who identified as White/Caucasian (n = 529) and participants who identified as African American/Black (n = 198). There were not enough participants who identified as Hispanic/LatinX, Asian American, American Indian/Native American, Multiethnic, or Other to be included in this analysis. To test for potential ethnic differences, a MANOVA was used for analysis. Table 2 depicts the mean and standard deviation scores for musical preferences by ethnic group. Results indicate a significant main effect for ethnicity on music preferences, $F(5,721) = 51.66$, $p < .01$, *partial* $\eta^2 = .26$. Follow-up ANOVAs were analyzed to determine where ethnic differences were revealed for specific musical preferences. These findings suggest individuals who self-identified as White/Caucasian report greater preferences for Intense/Rebellious music, whereas individuals who identified as African American/Black report greater preferences for Upbeat/Conventional, Energetic/Rhythmic and Latin music. The effect size of these differences was moderately small to small. There were no statistically significant differences based on ethnicity for Reflective/Complex music preferences.

Table 2.

Means and Standard Deviations for Music Preferences Theme by Ethnicity

Music Preference Theme	White (n = 529)	Black (n = 198)	F	p	*partial* η^2
Reflective/Complex					
Mean	15.15	15.59	.98	.32	< .01
Standard Deviation	5.45	4.99			
Upbeat/Conventional					
Mean	18.32	19.30	6.86	.01	.01
Standard Deviation	4.62	3.98			
Intense/Rebellious					
Mean	13.86	10.27	93.76	.01	.12
Standard Deviation	4.21	5.03			
Energetic/Rhythmic					
Mean	13.32	15.44	61.98	.01	.01
Standard Deviation	3.26	3.13			
Latin					
Mean	3.28	3.91	20.73	.01	.03
Standard Deviation	1.66	1.69			

Note. This table depicts the means and standard deviations for music preferences by gender.

Rurality Differences. Differences in music preferences were examined between participants who identified their hometown as rural (n = 411) and participants who identified their hometown as urban (n = 428). To test for potential rural differences, a MANOVA was used for analysis. Table 3 depicts the mean and standard deviation scores for musical preferences by rural group. Results indicate a significant main effect for rurality on music preferences, $F(5,833) = 3.35$, $p < .01$, *partial* $\eta^2 = .02$. Follow-up ANOVAs were analyzed to determine where rural differences were revealed for specific musical preference theme. These findings suggest individuals who describe their hometown as urban report greater preferences for Latin music. The size of this effect was small. There were no statistically significant differences based on rurality for Reflective/Complex, Intense/Rebellious, Upbeat/Conventional, or Energetic/Rhythmic music preferences.

Table 3.

Means and Standard Deviations for Music Preferences Theme by Rural Status

Music Preference Theme	Non-Rural (n = 428)	Rural (n = 411)	F	p	*partial* η^2
Reflective/Complex					
Mean	15.34	15.32	.004	.95	.00
Standard Deviation	5.45	5.31			
Upbeat/Conventional					
Mean	18.39	18.67	.85	.39	< .01
Standard Deviation	4.31	4.63			
Intense/Rebellious					
Mean	13.00	12.75	.59	.44	< .01
Standard Deviation	4.85	4.70			
Energetic/Rhythmic					
Mean	14.17	13.76	3.13	.07	< .01
Standard Deviation	3.37	3.41			
Latin					
Mean	3.82	3.42	10.71	.01	.01
Standard Deviation	1.75	1.79			

Note. This table depicts the means and standard deviations for music preferences by rural status.

Socioeconomic Status Differences. Differences in music preferences were examined between participants who identified their current SES as Low (n = 436) and participants who identified as High (n = 405). To ensure all participants were included in the analyses, individuals represented in the Low SES group indicated low or some financial resources, whereas individuals in the High SES group indicated substantial or high financial resources. To test for potential SES differences, a MANOVA was used for analysis. Table 4 depicts the mean and standard deviation scores for musical preferences by SES group. Results indicate a significant main effect for SES on music preferences, $F(5,833) = 4.96$, $p < .01$, *partial* $\eta^2 = .03$. Follow-up ANOVAs were analyzed to determine where rural differences were revealed for specific musical preference theme. These findings suggest individuals who describe their current SES as Low

report greater preferences for Reflective/Complex, Intense/Rebellious, Energetic/Rhythmic, and Latin music compared to those who describe their current SES as High. The effect size for these differences was small. There was no statistically significant SES difference on Upbeat/Conventional music preference.

Table 4.

Means and Standard Deviations for Music Preferences Theme by SES Groups

Music Preference Theme	Low (n = 436)	High (n = 403)	F	p	*partial* η^2
Reflective/Complex					
Mean	16.06	14.56	16.44	.01	.02
Standard Deviation	5.14	5.55			
Upbeat/Conventional					
Mean	18.46	18.59	.18	.67	.00
Standard Deviation	4.59	4.32			
Intense/Rebellious					
Mean	13.41	12.32	11.22	.01	.01
Standard Deviation	4.79	4.68			
Energetic/Rhythmic					
Mean	14.27	13.64	7.28	.01	.01
Standard Deviation	3.33	3.44			
Latin					
Mean	3.82	3.41	11.13	.01	.01
Standard Deviation	1.76	1.77			

Note. This table depicts the means and standard deviations for music preferences by SES.

Phase 2: Preliminary Analysis

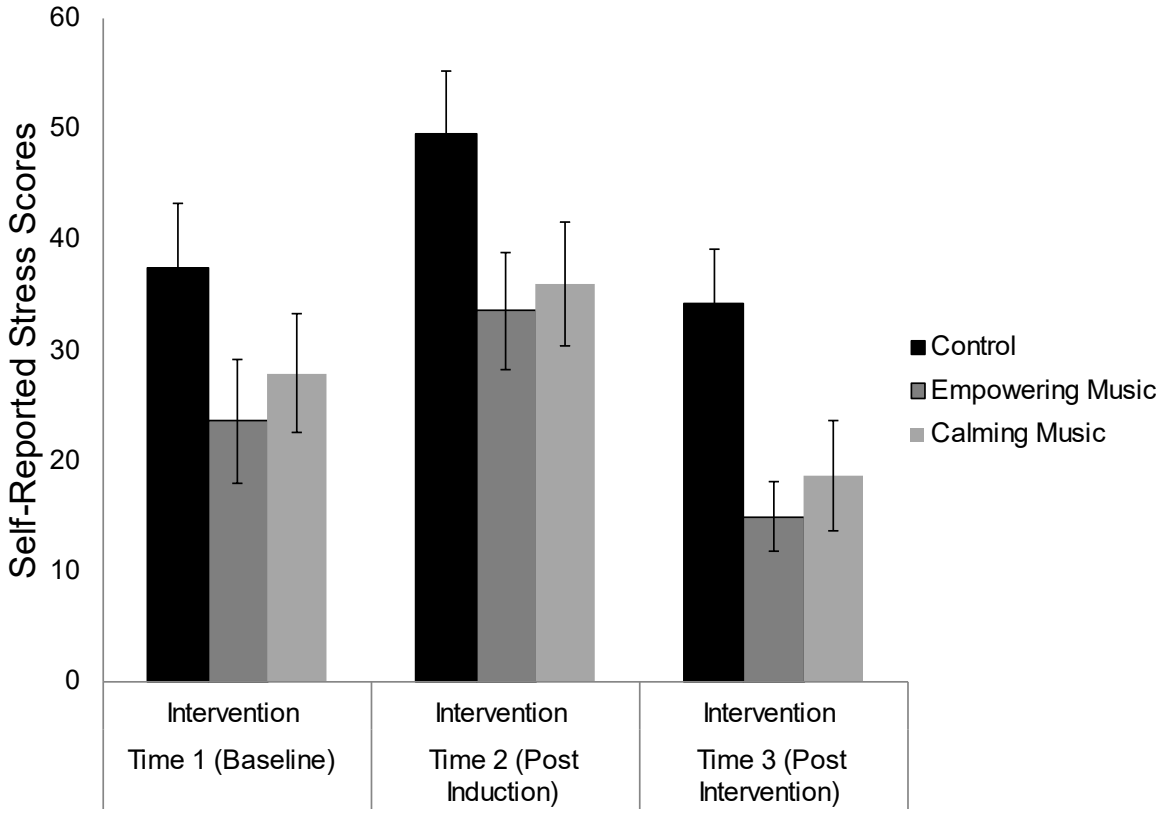
The current study evaluated variations in stress at three points (Time 1, Time 2, Time 3) across music condition groups (Control, Empowering, Calming). Main effects for Time and Condition as well as a Time x Condition interaction effect were produced for stress scores. The purpose of this analysis was to determine whether the stress induction task was effective in increasing perceptions of stress for all participants.

Manipulation Check. To ensure the validity of the social rejection stress induction task, an evaluation of participants' mean stress scores was conducted between conditions (Control,

Empowering, Calming) and across all time points (Time 1, Time 2, Time 3). A mixed factorial ANOVA was conducted to determine whether the social rejection stress induction task was effective in eliciting moderate amounts of stress among all participants equally. Results revealed a significant main effect for time $F(2,117) = 25.23$, $p < .01$, *partial* $\eta^2 = .3$ and a significant main effect for condition $F(2, 59) = 4.31$, $p < .05$, *partial* $\eta^2 = .13$. However, there was a nonsignificant interaction between condition and time $F(4,117) = .49$, $p = .74$, *partial* $\eta^2 = .02$. Figure 2 illustrates the interaction effect between Time and Condition on stress scores.

Figure 2

The Interaction between Condition and Time on Stress Scores



To ensure no group differences occurred at Time 1 and Time 2, I analyzed a series of ANOVAs. At Time 1, results revealed a nonsignificant main effect for condition $F(2,60) = .1.64$,

$p = .20$, *partial* $\eta^2 = .05$. Notably, participants who were assigned to the Control condition ($M = 37.39$, $SD = 28.41$) reported comparable stress scores to individuals assigned to the Empowering condition ($M = 23.55$, $SD = 26.52$) and Calming condition ($M = 27.89$, $SD = 22.64$). Similarly, individuals assigned to the Empowering condition reported comparable stress scores to individuals assigned to the Calming condition. These findings indicate that at baseline all participants reported similar stress scores.

At Time 2, results revealed a nonsignificant main effect for condition, $F(2,62) = .2.52$, $p = .09$, partial $\eta^2 = .08$. Notably, participants assigned to the Control condition ($M = 49.57$, $SD = 27.38$) reported comparable stress scores to individuals assigned to the Empowering condition ($M = 33.57$, $SD = 25.37$) and Calming condition ($M = 36$, $SD = 24.41$). Similarly, individuals assigned to Empowering condition reported comparable stress scores to individuals assigned to the Calming condition. This pattern was consistent with the overarching expectation that there would be no condition-based differences in stress scores at Time 1 and Time 2.

I also analyzed a repeated measures ANOVA to determine differences in stress scores from Time 1 to Time 2. Results revealed a significant main effect for Time, $F(1,62) = 16.30$, $p < .01$, *partial* $\eta^2 = .21$ such that participants at Time 2 reported higher stress scores ($M = 39.14$, $SD = 26.33$) compared to Time 1 ($M = 29.84$, $SD = 26.49$). In total, these analyses suggest that regardless of condition group individuals reported higher stress scores post stress induction compared to baseline. This pattern confirms the effectiveness of the social rejection stress induction task.

As an exploratory exercise, I evaluated how stress scores changed for different conditions post intervention. At Time 3, results revealed a significant main effect for condition $F(2,61) = 5.89$, $p < .01$, *partial* $\eta^2 = .16$. Post-hoc analysis revealed significant differences on stress scores

among conditions. Notably, individuals assigned to the Empowering condition (M = 14.91, SD = 15.29) and the Calming condition (M = 18.61, SD = 21.07) reported statistically lower stress scores compared to those assigned to the Control condition (M = 34.26, SD = 23.35).

Phase 2: Primary Analysis

The current study examined differences in positive emotion and negative emotion scores among participants randomly assigned to three conditions (Control, Empowering, Calming) and across time (Time 1, Time 2, Time 3). Self-reports of positive emotion and negative emotion were examined for the Control condition (n = 23), Empowering condition (n = 23), and Calming condition (n = 19) and were examined across three time points.

Within and Between Subject Differences on Positive Emotions. A mixed factorial ANOVA was conducted to assess the impact of three different conditions (Control, Empowering Music, Calming Music) on participants' positive emotion scores across three time periods (Baseline, Post Stress Induction, Post Intervention). Results revealed a significant main effect for time, $F(2,115) = 10.76$, $p < .01$, *partial* $\eta^2 = .15$, and a nonsignificant main effect for condition, $F(2,62) = 1.02$, $p = .37$, partial $\eta^2 = .03$. There was also a significant interaction between condition and time $F(4,115) = 8.07$, $p < .01$, *partial* $\eta^2 = .21$.

Because there was a significant interaction effect, I used a series of ANOVAs to probe differences in positive emotion scores by condition and across different times. At Time 1 (Baseline), results revealed a nonsignificant main effect for condition, $F(2,62) = .06$, $p = .94$, *partial* $\eta^2 = .01$. Notably, participants who were assigned to the Control condition (M = 32.34, SD = 7.86) reported comparable positive emotion scores to individuals assigned to the Empowering condition (M = 31.87, SD = 6.70) and Calming condition (M = 31.63, SD = 6.82). Similarly, individuals assigned to the Empowering condition reported comparable positive

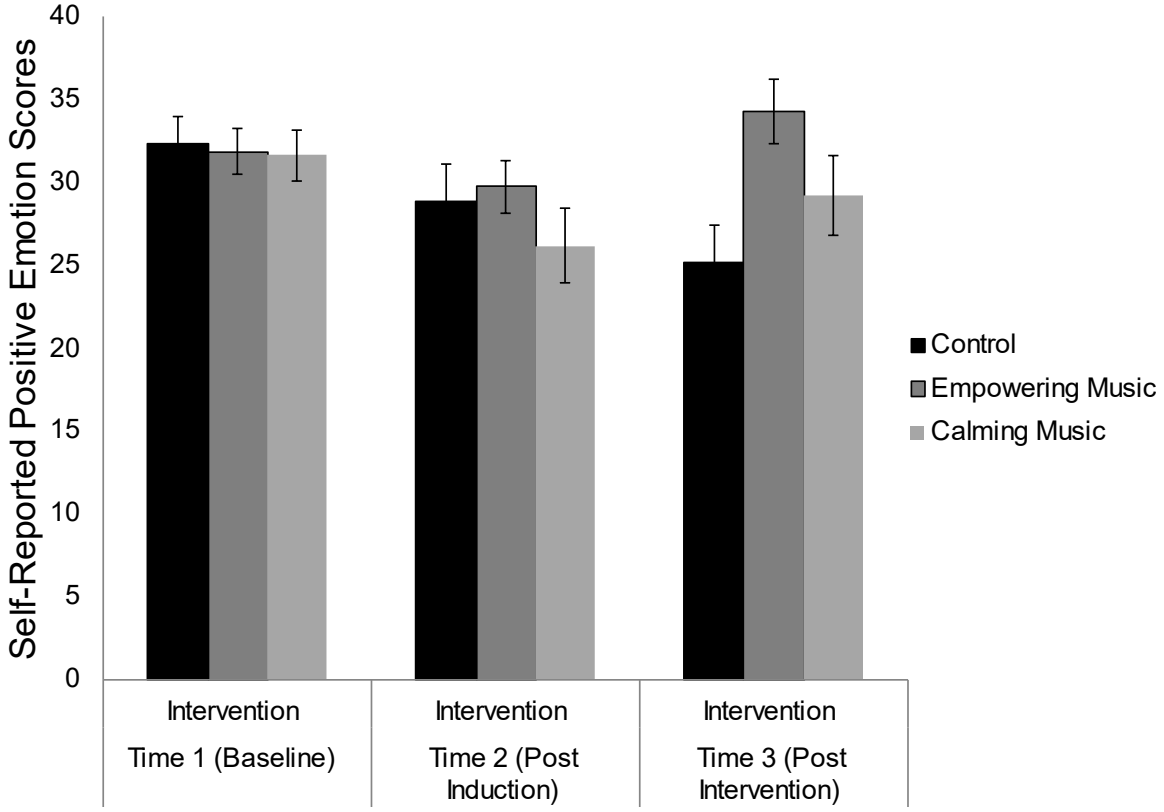
emotion scores to individuals assigned to the Calming condition. This indicates that at baseline all participants reported similar positive emotion scores.

At Time 2 (Post Stress Induction), results revealed a nonsignificant main effect for condition, $F(2,62) = .79$, $p = .46$, *partial* $\eta^2 = .03$. Notably, participants assigned to the Control condition ($M = 28.87$, $SD = 10.67$) reported comparable positive emotion scores to individuals assigned to the Empowering condition ($M = 29.74$, $SD = 7.67$) and Calming condition ($M = 26.16$, $SD = 9.88$). Similarly, individuals assigned to Empowering condition reported comparable positive emotion scores to individuals assigned to the Calming condition. This pattern was consistent with the overarching expectation of the study.

However, a different set of findings was detected at Time 3 (Post Intervention). Specifically, results revealed a significant main effect for condition $F(2,62) = 4.48$, $p < .05$, *partial* $\eta^2 = .13$. Post-hoc analysis revealed significant differences on positive emotion scores among conditions. Notably, individuals assigned to the Empowering condition ($M = 34.26$, $SD = 9.26$) reported statistically higher positive emotion scores compared to those assigned to the Control condition ($M = 25.17$, $SD = 11.02$). Figure 3 illustrates the interaction effect between Time and Condition on positive emotion scores.

Figure 3

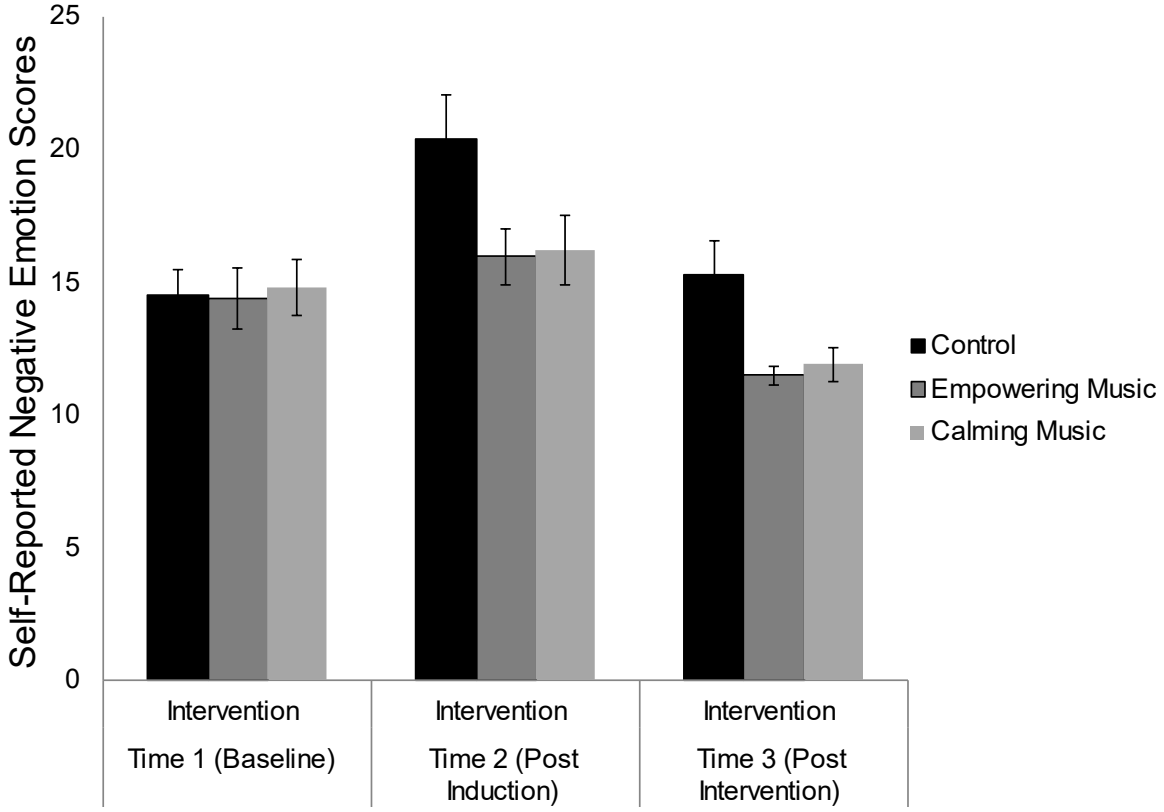
The Interaction between Condition and Time on Positive Emotion Scores



Within and Between Subject Differences on Negative Emotions. A mixed factorial ANOVA was conducted to assess the impact of three different conditions (Control, Empowering Music, Calming Music) on participants' negative emotion scores, across three time periods (Baseline, Post Stress Induction, Post Intervention). Results revealed a significant main effect for time, $F(2,123) = 28.52$, $p < .01$, *partial* $\eta^2 = .32$, and a nonsignificant main effect for condition, $F(2,62) = 2.70$, $p = .08$, *partial* $\eta^2 = 08$. There was also a significant interaction between condition and time, $F(4,123) = 3.27$, $p < .05$, *partial* $\eta^2 = .10$. Figure 4 illustrates the interaction effect between Time and Condition on negative emotion scores.

Figure 4

The Interaction between Condition and Time on Negative Emotion Scores



Because there was a significant interaction effect, I used a series of ANOVAs to probe differences in negative emotion scores by condition and across the three time points. At Time 1 (Baseline), results revealed a nonsignificant main effect for condition, $F(2,62) = .04$, $p = .97$, *partial* $\eta^2 = .01$. Notably, participants who were assigned to the Control condition ($M = 14.52$, $SD = 4.56$) reported comparable negative emotion scores to individuals assigned to the Empowering condition ($M = 14.39$, $SD = 5.46$) and Calming condition ($M = 14.79$, $SD = 4.66$), consistent with expectations.

At Time 2 (Post Stress Induction), results revealed a significant main effect for condition, $F(2,62) = 3.36$, $p < .05$, *partial* $\eta^2 = .1$. Notably, participants who were assigned to the Control

condition (M = 20.39, SD = 8.06) reported significantly higher negative emotion scores compared to participants in the Empowering condition (M = 15.96, SD = 4.95) and Calming condition (M = 16.21, SD = 5.77). However, there were no significant differences between participants in the Calming condition and participants in the Empowering condition on negative emotion scores. The fact that there are significant differences between conditions at Time 2 (Post Stress Induction) is somewhat problematic as all participants received the same social rejection stress induction task. To determine if error affected this finding, I evaluated the confidence intervals of the identified effects. As it turns out, the confidence intervals of the mean associated with the Control condition (LCI = 17.71, UCI = 23.07) overlaps with those of the Empowering (LCI = 13.27, UCI = 18.64) and Calming conditions (LCI = 13.26, UCI = 19.16). This suggests that the true score for the Control condition may be similar to the true scores of the Empowering and Calming conditions. Therefore, I was able to further evaluate condition differences at Time 3 (Post Intervention).

At Time 3, results revealed a significant main effect for condition $F(2,62) = 5.78$, $p < .01$, *partial* $\eta^2 = .16$. Post-hoc analysis revealed significant differences on negative emotion scores among the three conditions. Notably, individuals assigned to the Control condition (M = 15.26, SD = 6.21) reported statistically higher negative emotion scores compared to those assigned to the Empowering condition (M = 11.48, SD = 1.68) and Calming condition (M = 11.89, SD = 2.69). *partial* $\eta^2 = .01$. These scores suggest that participants from different groups reported comparable levels of change from Time 2 to Time 3 in terms of negative emotion scores. As a result, these findings suggest any condition-based differences detected at Time 3 are negligible and hard to interpret as clinically meaningful.

CHAPTER 5

DISCUSSION

Review of Purpose

Music demonstrates considerable potential as an ER mechanism based on its ability to facilitate stress reduction (Kenny & Faunce, 2004) and emotional expression (Gabrielsson, 2001). Yet, more research is needed to determine the effectiveness by which music is an ER mechanism. Importantly, it was essential to evaluate how different music interventions affect positive and negative emotional states after the experience of a stressful event. The current study explored music as a potential ER tool in this context. Specifically, this study examined whether music interventions better facilitate the upregulation of positive emotions and downregulation negative emotions after a social stressor when compared to a control group. Moreover, this study examined whether music preferences vary based on demographic categories as well as which specific attributes of music (i.e., self-selection, valence, energy, preference/familiarity) best facilitate ER processes. This study aimed to fill several gaps in the literature to provide a low-cost, accessible ER tool to both clinical and non-clinical populations.

Differences in Music Preferences

In the current study, I examined whether there were any differences in music preferences across different demographic categories. I examined possible differences among gender, race/ethnicity, socioeconomic status, and rural status identities. Statistically significant effects for all demographic categories were detected.

Gender Differences. Mean comparisons for gendered-based groups indicate self-identified women reported greater preferences for Upbeat/Conventional music whereas self-identified men reported greater preferences for Reflective/Complex, Intense/Rebellious,

Energetic/Rhythmic, and Latin music. These findings are in line with existing literature which looks at gender-based differences in music preferences using the STOMP (Shepherd & Sigg, 2015). Specifically, research indicates women prefer Upbeat/Conventional music whereas men prefer Intense/Rebellious (Colley, 2008; Shepherd & Sigg, 2015). However, the differences I detected were small in size. Research suggests multiple demographic variables (i.e., age, gender, nationality) often intersect to account for music preferences (LeBlanc et al., 1999). Therefore, it may be important for future studies to consider covarying demographic factors when examining gender differences in music preferences.

Ethnicity. Statistically significant differences were detected based on ethnicity, wherein individuals who self-identified as White/Caucasian reported greater preferences for Intense/Rebellious music, while those who self-identified as African American/Black reported greater preferences for Upbeat/Conventional, Energetic/Rhythmic and Latin music. This is consistent with existing literature, which suggests individuals identifying as White tend to prefer Intense/Rebellious music while individuals who identify as African American/Black tend to prefer Energetic/Rhythmic and Upbeat/Conventional music (Rentfrow et al., 2009; Mellander et al., 2018). Considering these results, it is possible ethnic differences in music may need to be considered in how different musical ER programs work for individuals of different ethnic identity status. Yet, the effect size of these differences in my study were moderately small to small. This may be the result of a small and relatively homogenous sample. As such, it will be important for future studies to collect larger, more ethnically diverse samples in order to detect more meaningful results.

Rurality. Mean comparisons for rurality revealed individuals who describe their hometown as non-rural reported greater preferences for Latin music compared to individuals

from rural hometowns. This is in line with past research (Mizell, 2005). However, this pattern of differences was extremely small and possibly holds little clinical meaning. While research in this area is somewhat limited, there is some research to suggest individuals who prefer Latin music tend to be high in openness to new experiences (Yoo et al., 2018). Similarly, individuals living in urban areas also report greater openness to experience than those living in rural areas (Mellander et al., 2018). Thus, future studies should consider how personality traits intersect with rural status to further delineate potential differences in music preferences.

Socioeconomic Status. The current study found significant differences in music preferences based on participants' SES. Specifically, individuals who described their current SES as Low reported greater preferences for Reflective/Complex, Intense/Rebellious, Energetic/Rhythmic, and Latin music compared to those who described their current SES as High. This is partially in line with existing research, which suggests individuals who endorse Low SES tend to report greater preferences for Intense/Rebellious and Energetic/Rhythmic (e.g., rap, hip-hop, funk; Mellander et al., 2018) rather than Reflective/Complex music (e.g., classical, opera, jazz; Katz-Gerro, 1999). Uniquely, participants from Low SES backgrounds also had a slight preference for Reflective/Complex music when compared to individuals from High SES backgrounds. This finding contradicts existing research, which has been previously conducted using broader community samples (e.g., Mellander et al., 2018). Nevertheless, the effect size of my finding was small, which may be due to the fact that I used a college student sample. College students tend to be higher in openness to experience than the general population (Hanel & Vione, 2016) and greater openness is associated with preferences for Reflective/Complex music (Vella & Mills, 2017). Hence, future studies may want to re-evaluate the potential for SES differences in music preference with more diverse and representative community samples.

The Effectiveness of Stress Induction Task

I used a social rejection writing task to induce emotional stress prior to random assignment to the music conditions. Results indicate the stress induction task was effective in significantly increasing participants' stress levels between Time 1 and Time 2. This finding is consistent with the literature promoting the use of writing tasks to elicit higher levels of stress in participants (Moons & Shields, 2015). In the future, it will be important for researchers to evaluate the effectiveness of this type of induction vs. other methods of stress induction as music may have a differential effect depending on the type of stress induced. For instance, arithmetic problems and experimenter-led hassles may be better ways to induce physiological rather than emotional stress (Chafin et al., 2004). Additionally, researchers might consider investigating the efficacy of visual-based induction tasks (e.g., pictures; Hunter et al., 2011, film clips; Brenner, 2000) compared to writing-based induction tasks on participant mood prior to music interventions. Right now, there is a diverse array of induction tasks being used in stress-driven studies. Because of this, researchers need to evaluate the additive effects of employing one induction task over another. This information will provide more meaningful evidence in helping researchers choose the most effective induction task to use in experimental research.

Effects of Music Interventions on Emotions and Stress

The current study examined the effect of music interventions on self-reported emotions and stress after participation in a social rejection stress induction task. Given the previous literature, I expected positive emotions to increase and negative emotions to decrease for participants who received the music interventions (Empowering and Calming) when compared to those in the control condition.

Positive Emotions. Individuals in the Empowering music condition reported greater positive emotions compared to those assigned to the control group at Time 3. This finding was medium in terms of effect size and consistent with current research that suggests music elicits positive emotions (DeNora, 2000; Juslin & Sloboda, 2001; Juslin & Västfjäll, 2008). Importantly, this finding adds to an area with limited research by revealing how certain attributes of music facilitate emotion regulation processes. Notably, it appears college students who listen to self-described "empowering" songs with which they have a personal connection are better equipped to manage positive emotions after a social rejection task. This may be explained in two ways. First, music described as "empowering" is often characterized as being high valence (i.e., musical positivity) and is associated with increases in positive emotions, such as inspiration (Koelsch et al., 2019). Second, when a person is familiar with a song, it reminds them of memories connected to the song (Baumgartner, 1992), which may help shift their emotional processes toward positive upregulation. Overall, it seems that self-selected music increases positive emotions, although the specific emotion regulation mechanisms are unknown. Moving forward, future studies should consider exploring the causal relationships among stress, music, and positive emotions. For instance, it is important to determine if cognitive processes (e.g., cognitive reappraisal; Gross, 1998b) moderate the link between listening to empowering music after a stressful event and positive emotions. Elucidating these pathways will provide theorists and researchers with a better appreciation for how empowering music is connected with positive emotions.

Conversely, individuals in the Calming music condition did not report statistically significant increases in positive emotions compared to those assigned to the control group. This finding is somewhat inconsistent with the literature suggesting low key music (calming) is able

to generate a number of positive emotions, like peace (Balkwill & Thompson, 1999). There are several potential explanations for this finding. First, it is possible there was a mismatch between the type of stress induced (i.e., emotional) and the type of music intervention. Research suggests relaxing music improves mood and increases positive emotions after exposure to a mental stress task (e.g., arithmetic; Yamamoto et al., 2007), but less is known about how relaxing music impacts positive emotions after an emotional stressor (e.g., social rejection). So, although participants in the Calming condition received self-identified "calming" songs, changes in positive emotions may have been impacted by the nature of the stress induced (i.e., emotional). Second, research often defines "relaxing" or "soothing" music with instrumental genres (i.e., without lyrics, e.g., classical (Chafin et al., 2004) or jazz (Zentner et al., 2008) and these specific genres tend to result in greater positive emotions among listeners (e.g., peacefulness; Zentner et al., 2008). No participants assigned to the Calming condition in the current study selected these types of music to be included in their playlist, which may explain why they did not experience significant increases in positive emotions. Overall, future studies might explore variations in positive emotions based on music interventions with and without lyrics as well as multiple types of stressors (i.e., mental strain vs. emotional) to better appreciate if and how calming music generates positive emotions.

Negative Emotions. Although analyses revealed significant condition differences in negative emotion scores at Time 3, this finding may have been skewed by reported differences on negative emotions scores at Time 2. To better evaluate whether musical interventions reduced negative emotion scores, I ran more analyses to evaluate change-based differences between Time 2 and Time 3 by condition. Results indicated there were no meaningful changes in negative emotions for the music intervention groups compared to the control group. This finding is

surprising and relatively inconsistent with existing research suggesting music is an effective method for regulating negative emotions (Garrido & Schubert, 2013). Given the disproportionately high negative emotion scores for individuals in the control group at Time 2, it is possible there were individuals in this group who experienced particularly strong emotional reactions to the stress induction task. For example, due to events in participants' personal lives, unrelated to the experiment, some individuals may have been more affected by the social rejection task. Moreover, in terms of sample size, the study was a low N study, indicating that random assignment may not have been able to fully and equally distribute comparable negative emotional reactions among condition groups. Given these difficulties, it is hard to make a determination on whether music interventions can effectively reduce negative emotion scores after a stressful experience. Future research needs to re-examine this question using strong design parameters. Notably, it is important to re-evaluate this question with a larger sample size to ensure random assignment equally distributes negative emotion reactions after a stressful event at Time 2.

Reported Stress. As an exploratory exercise, I investigated whether there were any differences in stress levels at Time 3 among participants in the music conditions compared to those randomly assigned to the control group. Individuals in both the Empowering and Calming condition reported statistically lower stress scores compared to those in the control group. The size of this effect was large and is consistent with existing literature on music's ability to reduce listeners' stress (Krumhansl, 1997; Yamamoto et al., 2007). Moreover, this finding lends credence to the idea that music may buffer the effects of stress on different types of outcomes. However, I cannot make claims that music interventions serve as a moderator because I did not randomize groups of people into stress induction conditions (induction vs. non-induction). Future

studies can extend this research by continuing to explore how music facilitates recovery after social rejection and other emotionally valanced stressors. Specifically, researchers may need to evaluate how different music interventions affect emotions for individuals who receive and do not receive a stress induction task. Completing a study like this will be able to evaluate if and how music interventions moderate the negative effects of stress on emotional outcomes.

Clinical Implications

One goal of mental health professionals is to prevent and mitigate negative psychological outcomes. Two ways to prevent such negative outcomes are to help clients increase positive emotions and reduce stress. The current study demonstrates how these two goals can be achieved by having clients listen to a self-selected empowering music playlist. Empowering music involves songs that are personally meaningful to the listener and elicit feelings of motivation and inspiration. Listening to empowering music may help clients practice emotion regulation by bolstering and increasing positive emotions while reducing stress levels. One way mental healthcare providers can incorporate empowering music into clinical practice is by asking the client to come up with a list of self-selected songs which generate feelings of inspiration or empowerment. The playlist should include 4-5 songs (approximately 15 minutes total) which the client prefers and enjoys. The client can listen to the playlist in-session or at home, although more research regarding the impact of the therapist's presence during music interventions as well as the efficacy of playlist length is needed. Additionally, it may be helpful for the client to track changes in their mood and stress after implementing music interventions. Overall, my results highlight the benefits of using empowering music to build important resources, which may mitigate, with further study, the negative effects of stress, conflict, and emotional pain in daily life.

Limitations

COVID-19 Pandemic Concerns. The COVID-19 pandemic directly resulted in the reduced power of this study. Specifically, the pandemic negatively impacted my ability to recruit and administer the study to the optimal number of participants needed to detect small, moderate, and large effect sizes. Rather than collecting data from 150 individuals, I was only able to collect data from 63 participants. This reduction in sample size decreased the power necessary to detect small and moderate effects. Furthermore, the limited number of participants impacted my ability to closely evaluate specific musical characteristics (i.e., valence, energy, popularity) of participants' preferred songs. Ultimately, the limited recruitment resulted in participants assigned to the music conditions receiving songs which they preferred and self-identified as "empowering" or "calming." This is an amendment to my original plan wherein I aimed to provide participants with more stratified playlists based on specific musical criteria. Future researchers should continue exploring specific attributes of music and how they impact ER efficacy. Likewise, it will be important to re-evaluate the questions posed in this study by sampling from a larger pool of college students.

Moreover, there may have been reluctance by students to participate in an in-person experiment due to pandemic-related anxiety. For example, it is difficult to know whether participants experienced pandemic-related concerns that resulted in greater distractibility during the experimental procedures. This may have resulted in challenges lowering stress levels using the music interventions. Additionally, it is difficult to determine whether participant data collected prior to the pandemic differed significantly from data collected during the pandemic because of the aforementioned changes. Going forward, it will be important to re-evaluate whether data collected during the pandemic is more susceptible to issues that may have

negatively affected the implementation of the stress tasks and music interventions. Finally, the pandemic required changes to the study protocol and timeline. For example, recruitment was stopped for several months due to the pandemic. When data collection resumed, experimental procedures had to be altered (e.g., masks, physical distancing, emailed consent forms) for the safety of the participants and the researcher. It is uncertain how these changes impacted my ability to detect significant findings. Overall, pandemic-related events may have interfered with the ability to detect significant results and to fully examine the effectiveness of music interventions.

Methodological Concerns. Due to the available methods of recruitment, the sample is comprised of undergraduate college students. Hence, the findings may only be generalizable to undergraduate college students and not to community populations. Furthermore, my sample was relatively homogenous in terms of ethnic identity, sexual orientation, and gender identity. In the future, it will be important for researchers to evaluate these hypotheses with more demographically diverse samples.

Data for this study were collected using self-report questionnaires. Self-report questionnaires are susceptible to social desirability bias and demand characteristics. To validate this study's findings, it would be beneficial for future studies to use observational or behavioral measures of stress and emotions. Lastly, it is possible that the lab-based nature of the experiment could impact the ecological validity of the findings. Future researchers might consider using apps or portable music players to collect data that is more reflective of real-life listening environments.

Because I ran a large number of tests, there is a small risk to increasing Type I error. Moving forward, it's important for researchers to validate my findings as a means to ensure that Type I error did not negatively affect my ability to interpret the statistical findings accurately.

Conclusions

This study examined the effectiveness of different music interventions in reducing stress and regulating emotions. The social rejection stress induction task was effective in inducing higher levels of stress. In addition, results revealed that music interventions significantly reduced stress levels following social rejection. However, only certain music interventions are effective in regulating emotions. Specifically, empowering music significantly increased positive emotions compared to the control group at Time 3. This indicates self-selected empowering music is an effective emotion regulation tool for bolstering positive emotions in the face of social stressors. Considering the limitations of this study, it is important for future researchers to wait a few years to adjust to the COVID-19 pandemic before recruiting a larger sample size to re-evaluate the effect of music interventions on emotion regulation.

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APPENDIX A

MUSIC BEHAVIOR INVENTORY (MBI)

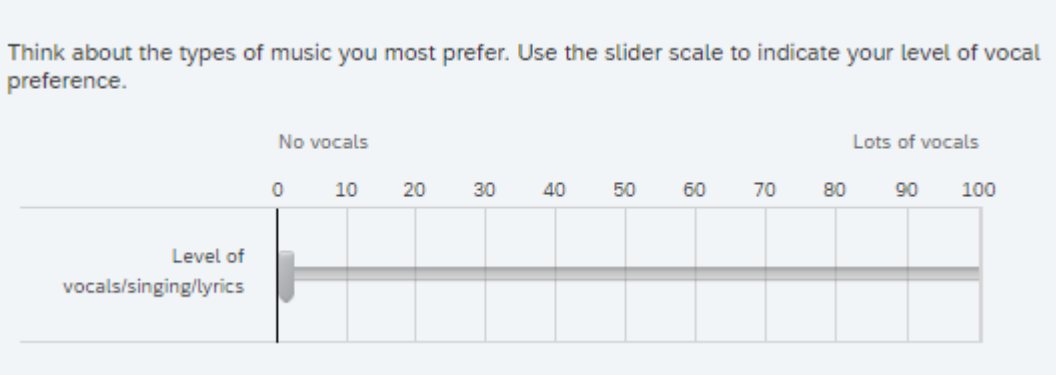
How often do you listen to music per day?

- (Not at all, less than an hour, between 1-3 hours, more than 3 hours)

In which environments do you usually listen to music?

- (In the car, with friends, while studying, exercising, while doing chores at home, alone)

Think about the types of music you most prefer. Use the slider scale to indicate your level of vocal preference.



How do you usually listen to music?

- (Computer, phone, Bluetooth speaker, vinyl records, CD player, car radio)

Do you use any of the following streaming services to listen to music?

- (Apple music, Spotify, Google Play music, Youtube, Tidal, iHeart Radio, Pandora, Amazon music, LiveXLive, Deezer)

Do you play a musical instrument or sing in a choir/band?

- (Yes/No)

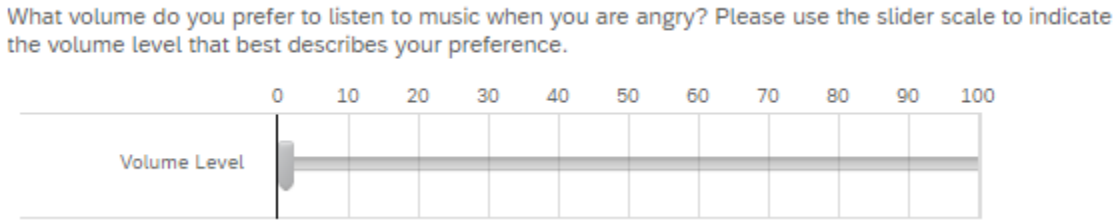
Approximately how many hours per week do you spend creating music?

- (Not at all, less than an hour, between 1-3 hours, more than 3 hours)

I listen to music when I'm angry.

- (Never, sometimes, about half the time, most of the time, always)

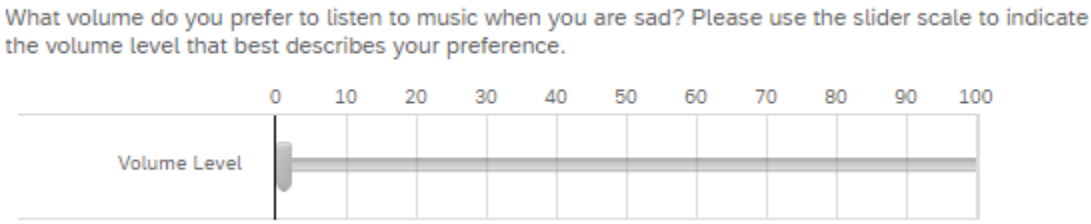
What volume do you prefer to listen to music when you're angry?



I listen to music when I'm sad.

- (Never, sometimes, about half the time, most of the time, always)

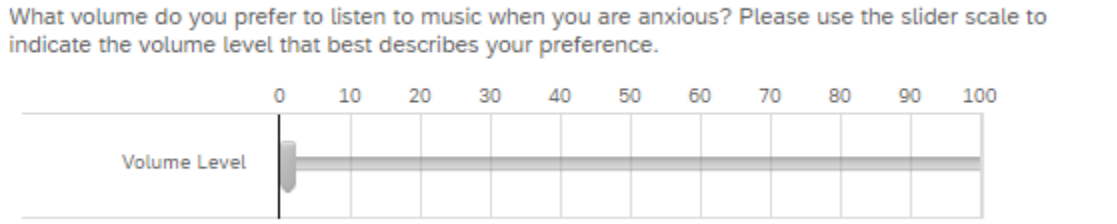
What volume do you prefer to listen to music when you're sad?



I listen to music when I'm anxious.

- (Never, sometimes, about half the time, most of the time, always)

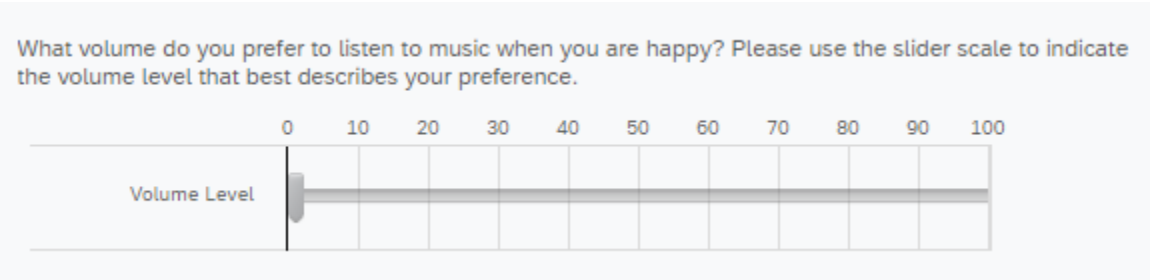
What volume do you prefer to listen to music when you're anxious?



I listen to music when I’m happy.

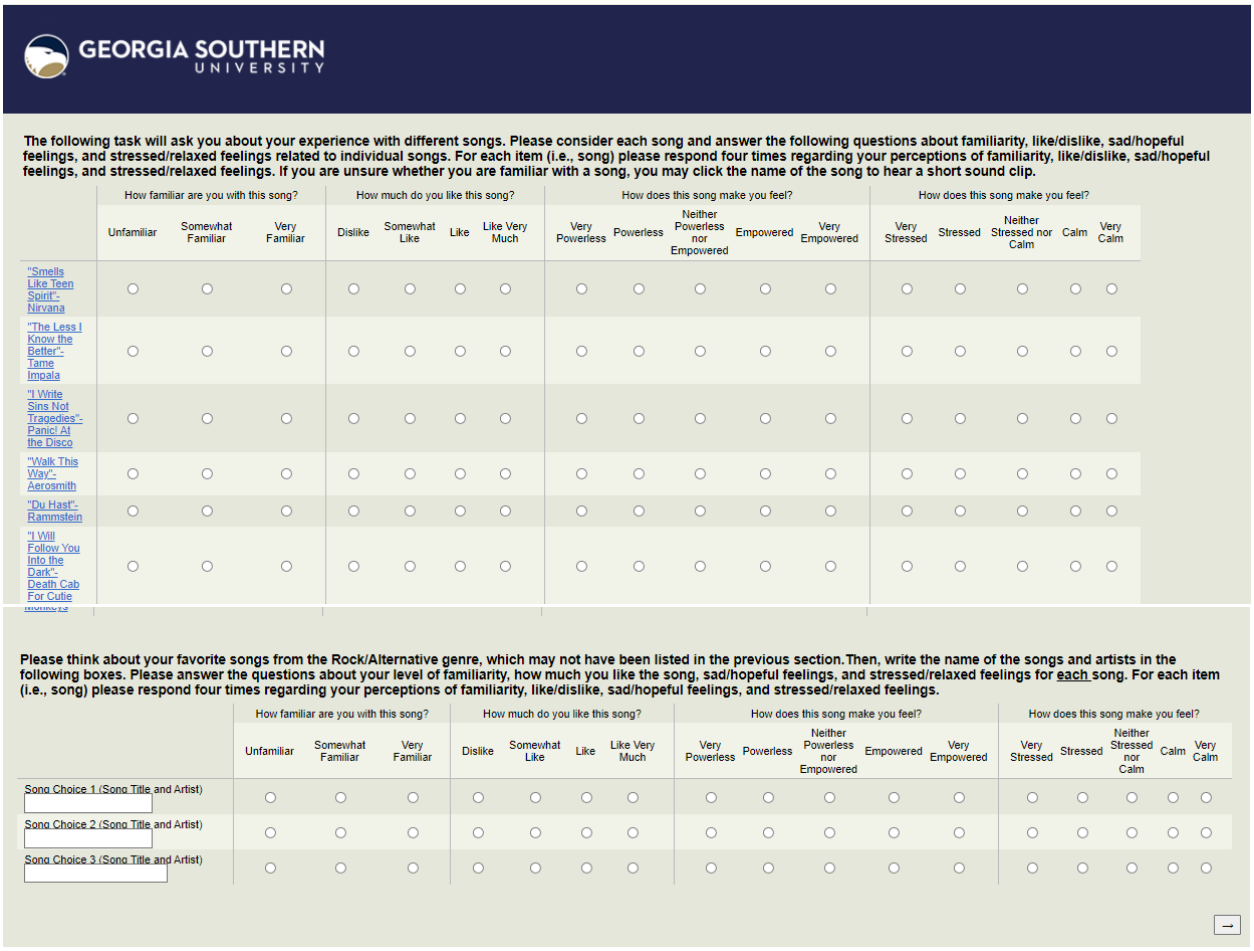
- (Never, sometimes, about half the time, most of the time, always)

What volume do you prefer to listen to music when you’re happy?



APPENDIX B

PHASE 1 PLAYLIST RESPONSE SAMPLE



GEORGIA SOUTHERN UNIVERSITY

The following task will ask you about your experience with different songs. Please consider each song and answer the following questions about familiarity, like/dislike, sad/hopeful feelings, and stressed/relaxed feelings related to individual songs. For each item (i.e., song) please respond four times regarding your perceptions of familiarity, like/dislike, sad/hopeful feelings, and stressed/relaxed feelings. If you are unsure whether you are familiar with a song, you may click the name of the song to hear a short sound clip.

	How familiar are you with this song?			How much do you like this song?				How does this song make you feel?					How does this song make you feel?				
	Unfamiliar	Somewhat Familiar	Very Familiar	Dislike	Somewhat Like	Like	Like Very Much	Very Powerless	Powerless	Neither Powerless nor Empowered	Empowered	Very Empowered	Very Stressed	Stressed	Neither Stressed nor Calm	Calm	Very Calm
"Smells Like Teen Spirit"- Nirvana	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
"The Less I Know the Better"- Tame Impala	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
"I Write Sins Not Tragedies"- Panic! At the Disco	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
"Walk This Way"- Aerosmith	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
"Du Hast"- Rammstein	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
"I Will Follow You Into the Dark"- Death Cab For Cutie	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Please think about your favorite songs from the Rock/Alternative genre, which may not have been listed in the previous section. Then, write the name of the songs and artists in the following boxes. Please answer the questions about your level of familiarity, how much you like the song, sad/hopeful feelings, and stressed/relaxed feelings for each song. For each item (i.e., song) please respond four times regarding your perceptions of familiarity, like/dislike, sad/hopeful feelings, and stressed/relaxed feelings.

	How familiar are you with this song?			How much do you like this song?				How does this song make you feel?					How does this song make you feel?				
	Unfamiliar	Somewhat Familiar	Very Familiar	Dislike	Somewhat Like	Like	Like Very Much	Very Powerless	Powerless	Neither Powerless nor Empowered	Empowered	Very Empowered	Very Stressed	Stressed	Neither Stressed nor Calm	Calm	Very Calm
Song Choice 1 (Song Title and Artist)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Song Choice 2 (Song Title and Artist)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Song Choice 3 (Song Title and Artist)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

→

APPENDIX C

PHASE 1 INFORMED CONSENT

1. We are Caitlin Fountain, doctoral student in clinical psychology, and Jeff Klibert, Ph.D., Associate Professor at Georgia Southern University in the Psychology Department.

2. The purpose of this study is to better understand how people look for and utilize support in different times in their lives. It is our hope that the information you provide us will increase our understanding of support-seeking in a way that will help us devise more effective and culturally sensitive ways of promoting healthy development for students.

3. Procedures to be followed: This study is survey-based. You will be asked to respond to a number of items asking about your music preferences, listening behaviors, and attitudes. This survey is best completed on a computer rather than a smartphone.

4. To the best of our knowledge, the things you will be doing have no more risk of harm than what you would expect to experience on a normal day. There are very few questions that ask about sensitive information. It is not expected that participants will be harmed by taking the online survey. However, if you do feel upset or distressed from participating in this study you may contact the GSU Counseling Center at 912-478-5541 or the National Suicide Prevention Hotline at 1-800-273-8255. Both services are free and are equipped to handle questions and concerns about emotional distress. Also if you experience discomfort, you have the right to withdraw at any time without loss of benefits.

5. There is no guarantee that you will get any benefit from taking part in this study. However, some people have obtained a deeper understanding of themselves, others, and the world they live in by participating in psychological research. Additionally, some people have also gained a greater understanding of how to conduct psychological research. We cannot and do not guarantee that you will receive any benefits from this study.

6. Today's survey will take approximately 50 minutes to complete.

7. This study is completely anonymous. Your identity will be protected to the fullest extent of the law. Your name will only be used to provide you with credit for participating in the study. The researchers will not be able to attach your responses to any identifiable features of your person. Also, we will only communicate your involvement in the study to your professor through the SONA system – all of your information is confidential. Your professors will not be allowed access to any of your responses. Moreover, all of your information will be held in a safe and secure environment. All data will be stored on a password protected data file and only the research team will have access to the data. All data will be maintained for future use in a de-identified fashion. Lastly, your information will be combined with information from other people taking part in the study. When we write up the study to share it with other researchers, we will write about this combined information. Your responses will not be identified in these written materials. Finally, because data will be collected through the internet there are always some risks concerning security. However, we have taken stringent steps to ensure that all your responses will be collected and maintained through the most secure means possible.

8. Participants have the right to ask questions and have those questions answered. If you have questions about this study, please contact the primary researcher named below. For questions concerning your rights as a research participant, contact the Georgia Southern University Office of Research Services and Sponsored Programs at 912-478-5465.

9. You will receive research participation credit for participating in this study. Participation in this research study is worth one research credit. Equivalent alternative research participation opportunities will be available for those who elect not to participate. Please see your course instructor for alternative research participation opportunities.

10. If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any benefits or rights you would normally have if you choose not to volunteer. Non-participation in this study will not negatively impact your grades. Furthermore, if you decide to take part in the study you still have the right to decide at any time that you no longer want to continue. You may also skip any question that causes discomfort or distress.

11. You must be at least 18 years old to participate in this study. If you are under the age of 18, please seek out your course instructor to obtain information about other research participation opportunities.

Please print off a copy of this consent form to keep for your records. This project has been reviewed and approved by the GSU Institutional Review Board under tracking number H20075.

Principal Investigator: Caitlin Fountain, B.A., caitlin_fountain@georgiasouthern.edu

Supervising Investigator: Jeff Klibert, Ph.D., jklibert@georgiasouthern.edu

Since we cannot obtain your signature to verify that you are voluntarily providing your consent to participate in this study, it is important that we obtain your consent through another means. By clicking the "I give my consent freely" button listed below, you are acknowledging that you have read and understood the instructions and limitations to participating in this research. Moreover, you are indicating that you would like to participate in this study as a volunteer. If you do not wish to take the survey or are hesitant about participating in this study, cancel out of the survey; then please e-mail the primary investigator to discuss any concerns you might have.

APPENDIX D

PHASE 2 INFORMED CONSENT

The Department of Psychology at Georgia Southern University supports the practice of protection of human participants in research. The following will provide you with information about the experiment that will help you in deciding whether you wish to participate. If you agree to participate, please be aware that you are free to withdraw at any point throughout the duration of the experiment without any penalty. Your participation is solicited, yet strictly voluntary. All information will be kept confidential and your name will not be associated with any research findings.

You must be at least 18 years old to participate in this study. If you are under the age of 18, please seek out your course instructor to obtain information about other research participation opportunities.
The purpose of this study is to better understand how people look for and utilize support in different times in their lives. It is our hope that the information you provide us will increase our understanding of support-seeking in a way that will help us devise more effective and culturally sensitive ways of promoting healthy development for students

In this study you will be asked to respond to a number of items asking about stress and emotions. This study is completely anonymous. Your identity will be protected to the fullest extent of the law. The researchers will not be able to attach your responses to any identifiable features of your person. Moreover, all of your information will be held in a safe and secure environment. All data will be stored on a password protected data file and only the research team will have access to the data. All data will be maintained for future use in a de-identified fashion. Lastly, your information will be combined with information from other people taking part in the study. When we write up the study to share it with other researchers, we will write about this combined information. Your responses will not be identified in these written materials.

If for any reason during this study you do not feel comfortable, you may leave the laboratory and receive compensation for your participation and your information will be discarded. Your participation in this study will require approximately 50 minutes. You will receive a $10 Amazon gift card for participating in this study. No additional research credits will be provided. When this study is complete, you will be provided with the results of the experiment if you request them, and you will be free to ask any questions.

Precautions will be taken in accordance with current Georgia Southern policies to reduce the risk of the spread of communicable diseases (including COVID-19). However, consenting to participate in this research indicates your acknowledgement of the risk of disease transmission. You also acknowledge your requirement to notify the researchers in the event that you are symptomatic prior to or at the time of participation

If you have any further questions concerning this study please feel free to contact us through phone or email: Caitlin Fountain at caitlin_fountain@georgiasouthern.edu or Dr. Jeff Klibert at jklibert@georgiasouthern.edu or at (912) 478-7282.

Please indicate with your signature on the space below that you understand your rights and agree to participate in the experiment.

_____	_____
Signature of Participant	Print Name

APPENDIX E

SOCIAL REJECTION STRESS INDUCTION TASK

Pre-Task Activities: The research assistant will give the participant a baseline measure for emotions (i.e., positive and negative) and stress.

Reliving Rejection Task: *Once the participant returns the completed measures, the research assistant will prepare the participant for the reliving task:*

> "I'm going to ask you to engage in a small writing task. Specifically, I would like you to write about a time in which you felt intensely rejected in some way, a time that you felt as if you did not belong. This rejection can be interpersonal in nature (e.g., a time in which someone broke up with you, or no longer wanted to be your friend) or can be a rejection from a group (e.g., a time in which you were chosen last for a team or excluded from a clique). I will give you about 2 minutes to think about a specific experience before you begin writing. Please let me know when you have chosen one."

After giving these instructions, the research assistant will stay in his/her seat and wait approximately 2 minutes for the participant to think about his/her specific experience. Once the participant has confirmed that they have a specific rejection experience in mind, the research assistant will give the following instructions:

> "Now that you have a personal experience of rejection in mind, I would like for you to write a detailed account of it. Think of the experience in terms of a story that has a beginning, middle, and an end. Specifically, reflect on the thoughts that went through your mind and the emotions that you experienced as the events unfolded. Once you have the outline of your story in your head, please type it out on the computer. Please write at least 400 words summarizing the story of your rejection."

After the participant has finished the writing task, leave the word document on the computer and ask the participant to complete the post-task measures.

APPENDIX F
CONTROL GROUP

Instructions. *Once the participant has completed the post-mood measure, the research assistant will prepare the participant for the reading task.*

Next, we are going to ask you to prepare to read an article about music theory. The goal of this exercise is to read mindfully, focusing all of your energy on the article in front of you. If you become distracted, simply refocus your energy on the reading. Please continue with the exercise until you have finished reading the article. Once you are finished, please minimize the article on the screen and I will come prepare you for the next task.
Before you start, please find a nice, comfortable position. Please let me know when you are comfortable (***wait until participant indicates comfort***). Now first notice your body as you sit in stillness. (***pause***). Imagine your eyes swiveling left to right as they scan the page in front of you (***pause***). Move your cursor to the digital page. Deliberately press down with your finger on the screen, the trackpad, or the mouse. Physically *feel* the click in your body (***pause***). Take a few moments to let your mind relax. Prepare to experience the content of the article fully, noticing the words, structure, and meaning, without judgement. Once your mind is ready, please let me know by nodding your head (***wait until participant indicates relaxation***). Good.

Before you begin the activity, do you have any questions?
Remember to pay attention to the article and all of the information within it. When you're ready, begin reading.
(Research assistant should watch the participant begin reading before leaving the room).

APPENDIX G

EMPOWERING MUSIC GROUP PLAYLIST

Genre	Song	Artist/Composer
Rock/Alternative	"Smells Like Teen Spirit"	Nirvana
Rock/Alternative	"The Less I Know the Better"	Tame Impala
Rock/Alternative	"Pressure"	Muse
Rock/Alternative	"Social Cues"	Cage the Elephant
Rock/Alternative	"Can't Stop"	Red Hot Chili Peppers
Rap/Hip-Hop	"Ms. Jackson"	Outkast
Rap/Hip-Hop	"Jesus Walks"	Kanye West
Rap/Hip-Hop	"LOVE."	Kendrick Lamar
Rap/Hip-Hop	"Still D.R.E."	Dr. Dre
Rap/Hip-Hop	"Keanu Reeves"	Logic
Pop	"You Need to Calm Down"	Taylor Swift
Pop	"Sorry Not Sorry"	Demi Lovato
Pop	"Sucker"	Jonas Brothers
Pop	"Shape of You"	Ed Sheeran
Pop	"Poker Face"	Lady Gaga
R&B/Soul	"U Remind Me"	Usher
R&B/Soul	"Real Love"	Mary J. Blige
R&B/Soul	"Tightrope"	Janelle Monae
R&B/Soul	"Touch My Body"	Mariah Carey
R&B/Soul	"Spotlight"	Jennifer Hudson

Country	“Down to the HonkyTonk”	Jake Owen
Country	“Cruise”	Florida Georgia Line
Country	“She’s Country”	Jason Aldean
Country	“Southbound”	Carrie Underwood
Country	“Good as You”	Kane Brown
Latin	“Soltera”	Bad Bunny
Latin	“Despacito”	Luis Fonsi
Latin	“Hips Don’t Lie”	Shakira
Latin	“No Lo Trates”	Pitbull
Latin	“Que Pretendes”	J. Balvin

APPENDIX H

CALMING MUSIC GROUP PLAYLIST

Genre	Song	Artist/Composer
Rock/Alternative	"I Will Follow You Into The Dark"	Death Cab for Cutie
Rock/Alternative	"Wish You Were Here"	Pink Floyd
Rock/Alternative	"Good Riddance (Time of Your Life)"	Green Day
Rock/Alternative	"Under the Bridge"	Red Hot Chili Peppers
Rock/Alternative	"Heathens"	Twenty-One Pilots
Rap/Hip-Hop	"Nike's On My Feet"	Mac Miller
Rap/Hip-Hop	"Earfquake"	Tyler, the Creator
Rap/Hip-Hop	"Jazz (We've Got)"	A Tribe Called Quest
Rap/Hip-Hop	"Anybody"	Young Thug
Rap/Hip-Hop	"Middle Child"	J. Cole
Pop	"Bad Guy"	Billie Eilish
Pop	"Hold Up"	Beyonce
Pop	"Lovesong"	Adele
Pop	"Memories"	Maroon 5
Pop	"Easier"	5 Seconds of Summer
R&B/Soul	"All of Me"	John Legend
R&B/Soul	"Saved"	Khalid
R&B/Soul	"Dangerous"	Meek Mill
R&B/Soul	"Me, Myself, & I"	Beyonce
R&B/Soul	"Whipped Cream"	Ari Lennox

Country	“Bless the Broken Road”	Rascal Flatts
Country	“Stay”	Sugarland
Country	“You’re Still the One”	Shania Twain
Country	“Speechless”	Dan + Shay
Country	“Blue Ain’t Your Color”	Keith Urban
Latin	“Un Año”	Sebastian Yatra
Latin	“Creo En Ti”	Reik
Latin	“Ojos Color Sol”	Calle 13
Latin	“Cúrame”	Prince Royce
Latin	“Dia de Enero”	Shakira

APPENDIX I

DEBRIEFING ACTIVITY

Instructions: Lastly, I am going to ask you to complete one last exercise. It should take only five minutes to complete.

Research Assistant Prompt: Take a moment to settle comfortably into your chair and let your eyes shut. Just continue to follow the sound of my voice, and if you find your mind drifting, simply notice it, and then come back to the sound of my voice. Now what I'd like you to do is let your mind trace the steps it took you to get here today.

Picture that process… getting up this morning… the routine of getting ready. Try to notice it like you're watching a movie of yourself. Maybe you had plenty of time to do the things you had to do today, maybe you were in a hurry. See if you can remember your thoughts and concerns as you were preparing to get here today… All the things during the day that you need to do.

Now, sort of push forward in time as you move closer to getting here. See if you can remember what your body felt like when you got here… recall the places you passed, people you saw… just let them all tick through your mind one by one.

And now, picture yourself arriving here… at this building. Gently watch the interactions you had with others as you arrived. Just notice each one. And then finally notice settling into your chair, where you find yourself, right now. And what I'd like you to do now is see if you can imagine that all of the strands of activity that brought you here today are like some kind of colorful fibers connected to you.

Imagine that these strands of activity that brought you to this moment gently begin to drop away with each inflow and outflow of your breath. Just breathe… and let yourself continue to notice those colorful strands dropping off slowly, until it's just you sitting here right now.

Let yourself become aware of your body and your breath. And drawing your attention to your breath, take three very gentle, full breaths… Trying to notice each small detail of breathing gently in and out**.** And when you are ready, slowly return your awareness to the room, and open your eyes.