Effects of Music on Pain Perception and Heart Rate

1. The subjects for this experiment will come from the undergraduate student population at Texas State University-San Marcos. The number of students anticipated to participate in the study is approximately 100 (50 male and 50 female). The estimated age range of the students is between 18 and 30 years of age. Outliers from the nontraditional student population are expected. The participants are expected to represent an array of ethnic backgrounds and will be assumed to be of good health with stable personality traits. The only criteria for exclusion are that the participant must be 18 years of age with no history of heart problems.

2. At the beginning of class, and with permission of the instructor, I will describe the study and read the consent form that includes an explanation of the procedure for the experiment and will be sure to answer any questions that follow. A sign-up sheet with available time slots will be available for students to sign up at a time that suits them and their schedules. A copy of the consent form (attached) will be given to the students to keep for their records. Although the students will be able to see the names of others that have signed up for the study, the names alone on the sign-up sheet do not reveal anything about the student other than their agreement to possibly participate in the study. When the students arrive to the study, they will sign a consent form.

3. The first part of the study will be used to obtain basic background information about the participant such as their age, sex, ethnicity, and health. These demographic questions will include those that are asked in almost every psychology study. The health portion of the general survey will cover factors that may affect blood pressure, such as a pre-existing condition or a high weight to height ratio, that may falsely indicate a higher than normal level of anxiety. This survey will take approximately 10 minutes and will be used to assess whether a participant has an abnormal anxiety level in any given condition. A blood pressure machine with a standard blood pressure cuff will also monitor the participants’ heart rate and blood pressure throughout the duration of the experiment, and a baseline will be established for the participant for the first 10 minutes. The participants’ will be divided randomly into one of these 5 groups:

1) Participants will listen to music that is major in key, 2) Participants will listen to music that is minor in key, 3) Participants will listen to music that is atonal (which lacks a tonal center), 4) Participants will listen to pentatonic based music, or 5) Participants will not listen to any music while undergoing the cold pressor task (control).

While music is playing, participants will place one hand into an ice water bath (approximately 40 degrees Fahrenheit) and be asked to leave it there for as long as they can. They will be timed as to how long their hand remains in the ice water. They will also be oriented to a pain scale wherein 0 is equivalent to no pain and 10 is equivalent to severe pain. The participant will be asked to give an initial rating of their pain and to provide ratings once they immerse their hand in the ice water using said scale once every minute.

**4.** Only minimal risks to the participants are expected in this study. Previous studies utilizing the cold pressor task have not revealed any adverse effects on the participant. The participants may experience an unpleasant feeling that is associated with submerging their hand in ice water for a short period of time. This experience may be dislikable, but the student may remove their hand at any point that it becomes too uncomfortable. In addition, time in the water will be limited to 3-4 minutes to eliminate the risk of tissue damage. If any problems occur or the participant begins to experience distress, the experimenter will intervene to ensure their safety. Some slight discomfort may be experienced by the participant due to the blood pressure cuff, but it will be no more than what they would normally experience in a doctors’ office and the discomfort will be temporary. There is a minimal chance that the participant may experience anxiety due to the cold pressor task. These responses cannot be pre-determined, but are noted in the design of the experiment. The discomfort due to the ice bath will be temporary and will be alleviated once the hand is removed from the water. There are no alternatives to the cold pressor task or the blood pressure cuff for collecting data for this study.

5. If the participant begins to become more uncomfortable that than deem bearable, the procedure will stop at once. The student will be debriefed and will be free to leave the study. If the condition of the participant is severe, they will be escorted to the Student Health Center immediately and every care will be taken to ensure that their needs are met and that their distress is eased as they wait to see a physician.

After the study is completed, the participant will be debriefed and given the contact information of the researcher, the IRB, and of local mental health care providers in the event that the study caused them emotional distress or if they are in need of comforting.

To protect the confidentiality of the participant, all the data collected will remain confidential and anonymous. The participants’ name will appear only on the consent form and they will be issued a number for the remainder of the experiment that cannot, in any way, be linked to their name on the consent form. The consent forms will be stored in a locked filing cabinet in Christy Rosner’s house and all other data will be stored in a separate locked filing cabinet at the same location. If the study is published, the names of the participants will not be printed so their identity remains confidential. After five years, all information regarding this study will be destroyed via a paper shredder.

6. The benefits that may be gained from this study include an increased knowledge about some factors that affect pain. If it is found that a certain kind of music (major, minor, atonal, or pentatonic) increases the amount of time that participants are able to keep their hand submerged in ice water, this knowledge could be applied to everyday life to improve the overall well-being and ability to cope with physical pain of many people. The participants may also raise their awareness of their personal pain endurance. Hospitals could benefit from this information as they care for those who are in pain and for those that experience pain on a daily basis. If a particular kind of music is found to be most helpful in calming participants and extending the amount of time that they are able to endure the cold pressor task, then this type of music could be played more heavily in a hospital setting in the hopes that it would help ease those that are suffering and calm the anxieties of patients and families alike.

7. With consent of the instructor, the participants in the study will be awarded extra credit points that would equal approximately 1% of their course average. If the student wishes to obtain the extra credit points but choose to not participate in the study, an alternative to participation that includes reading and summarizing a journal article that covers music as it pertains to psychology is offered.

8. The benefits of this study outweigh the risks involved. The risks of temporary discomfort are no more than what could be expected in the everyday life of a participant. There is minimal psychological risk involved that accompanies most research or psychological examination performed. The information and knowledge acquired from this study will contribute to society, and hospitals in particular, where the implications can be applied to minimize discomfort of patients who are in pain as a result of an accident, an illness, an operation, or for any other reason. Past studies have revealed the benefits of music therapy on a number of different kinds of patients in hospitals. Discovering which type of music in particular is able to alleviate pain (and reduce the anxiety associated with pain) could help shape the way hospitals manage the pain of their patients. For the participants in the study, knowledge that one kind of music may help alleviate pain over another may shape the way that they approach any physical pain that they may encounter and offer the participants an alternative to conventional pain management options.

9. The research for this study will be conducted on the campus of Texas State University-San Marcos in its entirety.

10. I, Christy Rosner, am an undergraduate psychology student who will conduct this research study to complete an individual study course to fulfill my course requirements for graduation with a B.A. in Psychology from Texas State University-San Marcos. Dr. Crystal Oberle of the Psychology department at Texas State is my supervising faculty member.

11. A letter of approval from Dr. Oberle will be included in the IRB application.

12. This study has not been reviewed by another IRB.

13. I, Christy Rosner ([cr1394@txstate.edu](mailto:cr1394@txstate.edu)), am the only undergraduate with access to the results during the entire process of the study. Dr. Crystal Oberle will also have access to these records for experimental purposes only. After the study is completed, only Dr. Oberle will have access to the experimental data. Upon publication, journal readers will only view the results of the study. The participants’ confidentiality will remain intact as disscused in #5 of this proposal.