Effect of Music on Reactance to Physiological Stress

Brian Duffany
Eastern Connecticut State University

Introduction
- Like stress, anxiety has been shown to increase the activity of the sympathetic nervous system, which includes increasing heart rate (HR) and blood pressure among other physiological function whose hyperactivity can deteriorate health (Han et al., 2010).
- According to Quas (2011), physiological measures are superior measures of stress since they overcome observer and reporter biases, which are possible even in children.
- Electric shock, and the threat thereof, have been shown to be reliable stressors in experimental designs that, “Present multiple, time-limited, threat stimuli,” (Clark et al., 2012 p. 1436)
- Previous research has studied the possibility of music as being a stimulus which can interfere with the human stress response, yet took measures of stress separately from the participants’ exposure to the musical stimulus (Thoma et al., 2013).
- Another previous study on music as being a stimulus which can interfere with the human stress response utilized a group of critically ill participants (Han et al., 2010).
- The current experiment utilized a sample that was relatively more healthy (not hospitalized), and recorded physiological measures of stress concurrently with music being played.
- It is hypothesized that heart rate, Galvanic Skin Response (GSR), and Electromyogram (EMG) responses to electric shock will decrease in response to Katherine Jenkins’ performance of Gregorio Allegri’s Miserere (relaxing musical stimulus).

References

Procedure
- Participants completed demographics information in a separate office space
- Participants went to laboratory space, and were connected to BioPac, which recorded physiological data
- HR was recorded throughout
- GSR was recorded throughout
- EMG was recorded throughout
- Baselines measures (with participants sitting upright, yet at rest) for all of the physiological measures were taken for a five minute period.
- Participants were then told the first test was to begin, and reminded that they would experience slight electrical shock during the testing.
- Over the next four minutes, participants received an average of ten shocks at quasi-random intervals, typically between every fifteen and thirty seconds.
- Participants then completed other tests that measured effects of various variables on stress for about ten minutes.
- Participants were then told that the second test was to begin, and were reminded that they would experience slight electrical shock during the test.
- Over the next four minutes, participants were exposed to Katherine Jenkins’ performance of Gregorio Allegri’s Miserere a received an average of ten shocks at quasi-random intervals; between every fifteen and thirty seconds.

Discussion
- Most physiological responses did not change significantly with the music versus without (p>.05), and the one that did (EMG), showed higher reactivity in the presence of music versus without it.
- Future studies should control for ambient noise, which was present with and without the music. This may have interfered with reactivity to the stressor.
- The lack of significant results can be attributed to the small sample size (n=9).
- Applicability to the general population is further limited by how the sample was drawn entirely from a college population.
- Future studies should control for more extraneous variables such as mental disorders, preferences for music, musical training, cardiovascular, and neurological disorders which could have influenced the results.
- An ambient noise and silent control groups should be used to account for the possibility that mere noise, or a lack thereof, could influence reactivity.