How Music Affects Your Heart Rate

by Mallory Konopa and Sabrina Honts
Background Research

For this Project Presentation night, the choice of us was to test how music can affect your heart rate. So many days it has taken to collect a decent amount of reliable information. Our actual hypothesis is “The faster the music, the faster your heart rate would be. Then the slower the music, slower the heart rate you will be.” So far based on just research (1/28) it seems to be the answer as it proves true.

In both Health and Project Block we have been working this but mainly in Project Block. Given the work time we had, this is what we collected. For first of, depending on the music it can lower your heart rate. For people who listen to music 20-30 minutes a day have a lower blood pressure then those who don’t. Classical music will lower heart rate along with slower songs. Rap however has been seen to increase heart rate.

With all the information we read on from trusted medical sources, we were leaning even more on our original thesis. Our testing will prove whether or not we are correct.
We have asked:
- Is the body's functions affected at all?
- Have you been involved with an experiment like this one?
- If so, what did the result come out as?
- Do you any advise or helpful tips for us?

She responded with...
The body's functions are definitely affected by different types of music. The only experiment that I have personally been involved with (somewhat related to this) was in college when we worked with a farmer to see how much milk his cows would produce. I honestly can't remember what the two types of music were or what the results were. I wish I remembered more about it!
One factor that you may want to consider is the subjects preferred type of music. That will also have an effect on how their body responds.
Live Expert #2-
-What types of music might lower a person’s heart rate? There is no specific “type” of music that will lower a person’s heart rate. The important factor in music that raises and/or lowers heart rate is the tempo or beats per minute of a song. If you look up entrainment there is research done on the fact that we match what is in our environment including music tempos. So, for a major sporting event, you won’t hear “slow, relaxing” music, instead you will hear upbeat tempos and faster moving songs. **Entrainment** offers a lot of information in this area.

-How long have studies been conducted relating to heart rate and music? I’m not positive on dates. But, a long time.

-How are hospitals using music in relationship to helping patients? Hospitals are varying in how they are utilizing music in relationship to helping patients. Some hospitals are purposeful in the music that they have playing in their waiting areas (studying instrumentation, tempo, and genre), other hospitals are hiring music therapists to provide group and/or individual music therapy for different patients and other hospitals are not utilizing music at all.
Live Expert #2- Sara Devine MT-BC, LCSW, Music Therapist and Cancer Support Counselor, Martha Siekman Cancer Center

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-What is holistic medicine? Holistic medicine, in my mind, is looking at the whole person and finding all approaches that may help an individual. For someone going through cancer treatments of radiation and/or chemo therapy they may have some side effects. Looking at these side effects, there many complementary therapies that may be helpful in working with these side effects such as Acupuncture, massage therapy, yoga, music therapy, reiki, healing touch, art therapy, counseling, etc. Holistic medicine is a healthy approach in doing what is best for each patient.

-What is the size of your heart? Not sure what you are looking for here – about the size of my fist, would be a physical answer – an emotional/behavioral health approach may be to answer that as “large and filled with hope”
“Listening to faster music will increase heart rate more than listening to slower music.”
MATERIALS

Computer with LoggerPro software
Vernier Labquest
Heart Rate Sensor
Quiet Environment
Flash drive
Media Device
3 pre-selected songs of different genres
iPad
ear buds/headphones
Procedure

I. Set up
1. Set up location (Media Pit & Check with Mr. Nault- his conference room... Somewhere completely quiet)
2. Get computer or media and set it up with the headphones at 30 volume
3. Interview (interrogate) test subject on their background
4. (While one partner is doing the questions) Set up the data logger
   a. Turn on logger pro with sensor connected. (make sure it’s working)
   b. Click on length and set it to 300 seconds (main tab)
   c. Under the Graph, select graph>show graph>Graph 1
*** after the first run go to graph>store data and repeat after 2nd run.
After all three tests are completed save it on to a flash drive
II. **Start Experiment**

1. Test Subject grips heart rate sensor
2. Turn on data logger pro (power button)
   a. Plug in the sensor to the CH 1 port on the side of the logger pro
   b. Make sure it’s working properly (Logger Pro)
3. Test subject insert headphones
4. Start music at level 30 and have the person listen for 2 minutes 30 seconds (270 seconds) (have data logger pro start and run during this time)
5. Save and repeat for every song (and after every run)
6. Save the graph on a flash drive - finished and save onto a computer
7. Repeat for the other testing subject
Designing experiment
*The average heart rate of a teen between the ages of 13-19 is anywhere from 50-90 beats per minute.*

<table>
<thead>
<tr>
<th>Person</th>
<th>Music</th>
<th>Heart rate before</th>
<th>Heart rate during</th>
<th>Heart rate during the break in between songs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mallory</td>
<td>Pop (Starships- Nicki Minaj)</td>
<td>57.03</td>
<td>63.71</td>
<td>69.45</td>
</tr>
<tr>
<td></td>
<td>Slender theme</td>
<td></td>
<td>64.11</td>
<td></td>
</tr>
<tr>
<td>Sam</td>
<td>Pop (Starships-Nicki Minaj)</td>
<td>74.45</td>
<td>81.32</td>
<td>80.03</td>
</tr>
<tr>
<td></td>
<td>Slender Theme</td>
<td></td>
<td>78.67</td>
<td></td>
</tr>
</tbody>
</table>
Mallory’s Results

Rest - Pop - Rest - Creepy

0-120 Resting
121-240 Song 1
241-360 Resting
361-480 Song 2
Sam’s Results

Rest 0-120
Song 1 121-240
Rest 241-360
Song 2 361-480

Rest- Pop- Rest- Creepy

Heart Rate (bpm)

Time (s)
Conclusions from Experiment

So we have concluded the music does in fact, affect heart rate. Not much was affected during the testing, it was slight by beats. Then during the second resting, that was off for the average do to a unexpected spike in the middle of it. But based off of the average heart rate before any music, the heart beat when up from 4-8 beats.

During the second testing, it went better for our test. Since we had a bit more practice, it had been easier to follow through on it and not lose any data. Not once was there a technical difficulty during this testing, nor didn’t it ever hit zero due.
Visual Observations

Now with all the testing we originally planned it was a time crunch but we managed to get 2 solid tests for our experiment. Something visualized during both the tests, was that the people being tested at times, would sometimes laugh and have trouble keeping a straight face. Another thing is that outside noises were harder to control but overall barely any outside noise.
Sources:

http://jrscience.wcp.muohio.edu/nsfall05/LabpacketArticles/EffectofMusiconheartrate.html


http://circ.ahajournals.org/content/116/24/F139.full.pdf

http://www.ideafit.com/fitness-library/music-affects-heart-rate
Applied to Real Life- How can this be applied to real life?

This can be applied to real life is a few different ways, but one that we mainly followed was exercise. With combining exercise with music, both increasing the heart rate. For some people music can help them concentrate and relieve stress. But back to the music and exercise, anyways the music can help with better concentration for some with that helping them for a better workout.