Factors affecting heart rate

Research Question

To what extent does watching different genres of movies affect our sympathetic and parasympathetic nervous systems, causing changes in heart rate?

Introduction

There are many reasons which cause change in normal heart rate (60 – 100 beats per minute). Watching different genres of movies causes our sympathetic and parasympathetic nervous systems to release certain hormones particular hormones which make us react in different manners.

The sympathetic components increase heart rate by releasing the neural hormone catecholamines - epinephrine and norepinephrine. These hormones are cardio accelerators. Acceleration of the heart rate is called tachycardia.

The parasympathetic nervous system located in the brain stem and upper or sacral portion of the spinal cord slows heart rate. The parasympathetic components decrease heart rate. These neurons release the neurohormone acetylcholine, which inhibits heart rate. The slowing of heart rate is called bradycardia.

Another major role playing hormone is adrenaline which causes an immediate hike in the heart rate.

Hypothesis

Different stimulus causes different changes in heart rate because of varied responses from the sympathetic and parasympathetic nervous systems. Watching horror and action movies should cause a greater increase in the heart rate, whereas, comedy and romance are more probable to cause a slight hike. On the other hand, watching a musical is expected to make the heart rate stable and almost near normal as the softness of the music used this case is supposed to make any living creature calm.

Variables

Dependent Variable (DV)		Heart Rate
Controlled Variables	**Independent Variable (IV)**	Stimulus provided in the form of a horror movie, a comedy video, a romantic movie, an action clip and a musical movie.
	Fixed Variables (Constants)	• The normal human heart rate (in this case, heart rate of 6th subject who is at rest and has not been exposed to any stimuli) • The time duration of each movie clipping (10 min each) • The gap between 2 clippings (3 min for rest after each movie clipping is viewed and the pulse has been recorded)
Uncontrolled Variables		• Subjects may not necessarily be concentrating on the movie • A 10 minute clipping may not necessarily always create the required change in mood.

Materials Required

Stopwatch
5 Movies (one from each of the genres noted above)
6 subjects

Procedure

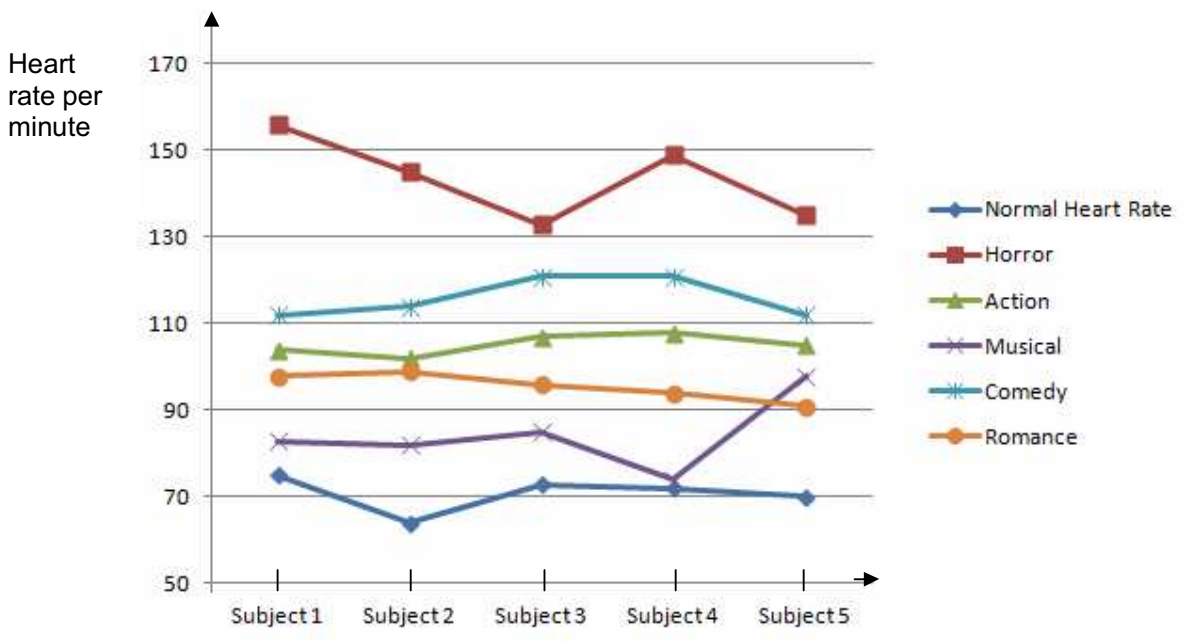
a) Make the subject relax and rest for 5 minutes.
b) Take the normal pulse.
c) Now, show a 10 minute clipping of the horror movie and take pulse of the subject at the climax of the movie clipping. Allow the subject to relax for 3 minutes after the first clipping before introducing the second, thus, allowing the heart rate to go back to normal.
d) Repeat the steps for all the subjects for all other genres and note the observations.
e) Also, note the heart rate of a 6^{th} subject who is at continuous rest for 10 minutes without exposing him to the stimulus (movies). This will be the fixed variable.

Data Collecting and Processing

Table 1 - Result

Normal / Type of Stimulus	Heart Rate per minute of subject					
	1	2	3	4	5	6 (fixed variable of another subject)
Normal Heart Rate	75	64	73	72	70	76
Horror	156	145	133	149	135	
Action	104	102	107	108	105	
Musical	83	82	85	74	98	
Comedy	112	114	121	121	112	
Romance	98	99	96	94	91	

Figure 1 - Analysis



Conclusion

Thus, the result was in agreement with the hypothesis as horror movies saw the highest hike in heart rate. The next expected rise was in the case of action movies, but, instead the result showed that comedy showed a higher rise in heart rate. This was not because of the sympathetic nervous system, but on the contrary, it was simply because laughing caused the heart rate to increase. Musical movies showed an expected result, whereas, romance triggered a higher heart rate than was expected in the hypothesis. This proves heavy involvement of the sympathetic nervous system in the genre of romance also.

In conclusion, the reaction to the movies (stimulus) arises from the sympathetic nervous system of our brain, thus, increasing the heart rate in most cases. Whereas, the parasympathetic nervous system comes into function after the stimulus has been removed, thus, bringing the body back to rest position by lowering th e heart rate.

I felt that the data was different for each person, thus, we cannot generalize a particular pattern as a universal result. Also, it was not necessary that the subjects were concentrating only on the movie clippings. To get a better result, the clippings should have been longer and the subjects should have been exposed to more number of clippings in the same genre, thus, giving more readings from which an average can be obtained, hence, giving us a better view and helping us to formulate a particular pattern in occurrence.