The Netflix Heart: Comedy vs. Horror

Authors: Trinity Ngo, Mayra Rodriguez, Leslie Rivas, Valeit Robinson

Abstract

The project involves the Cardiovascular System. The study involves testing our heart rates (HR) while watching movies on Netflix since it would be interesting to see the heartbeat fluctuations from mental stimuli instead of the popularly done physical stimuli. Each of the members and volunteers will watch the same horror and comedy movies alone and take our pulses at the same points in time during the films. The methods used were a combination of radial and carotid pulse for a minute count to determine pulse. Therefore, we have decided to test the experiment on four female, community college students from ages 20-40 in addition comparing the HR among subjects across movie genres. Using the data from every individual we will visually apply our findings on a graph. Horror and comedy movies are important to our study because we want to know how our heart is affected by watching them.

Introduction

In the textbook (2017) “The Principle of Human Physiology,” “the cardiovascular system is critical to the maintenance of homeostasis in two ways: It provides cells with oxygen and nutrients necessary to generate ATP, and it delivers carbon dioxide and waste products to the lungs where there eliminated from the body. The number of contractions per minute is the HR. The normal resting HR in humans is approximately 72 beats per minute. Not all ~~the~~ HR are necessarily the same ~~as others~~. This variation occurs because ~~a person's~~ HR depends on many factors, like general health, age, level of muscular activity and emotional state. When a person is anxious, or frightened, the HR can increase from normal resting value, to more than 100 beats

per minute, sometimes as high as 180 beats per minute." (Stanfield, 2017). "Because many films transmit ideas through emotion rather than intellect, they can neutralize the instinct to suppress feelings and trigger emotional release," said Birgit Wolz, a psychologist focusing on movies as therapy, and author of " E- motion Picture Magic," from the article " Movies May Cause Special Effects On The Body," by Danielle Braff.

According to Muhammad Qarid and Muhammad Asif from the Institute of Molecular Biology and Biotechnology, Baha Uddin Zakariya University, Pakistan, said "There is a key relation between watching horror movies and pulse rate, when you feel fear after watching the movie, your mind takes it as stimulus and release adrenaline hormone. It prepares the body to maintain nervousness and boost your body temperature, heart beat and blood pressure. You feel anxiety and stress which can direct to physical effects such as increased heart rate and sweating."

Also in the article "Physiological to Fear in Expected and Unexpected Situations on Heart Rate, Respiratory Rate and Horizontal Eye Movements," said "This is attributed to the sympathetic flight-or-fight response triggered by the fear center located in the amygdala. The release of norepinephrine on the beta-adrenergic receptors, located on the SA node and the ventricles of the heart, causes an increase in heart rate" (Schmitz et.al, 2012).

The purpose of the experiment is to determine if the HR increased by watching a horror movie, or comedy movies. In a study made by Jo Sugawara, PhD, Takashi Tarumi, MS, and Hirofumi Tanaka, PhD, they wanted to determined that mirthful laughter are elicited by watching comic movie. "Because the act of laughing is accompanied by contraction of thoracic, abdominal and facial muscles, cardiac output and peripheral blood flow are expected to increase while viewing a comedy."

The reason that we chose this experiment is to see the impact or effect in our HR from the two different genres of movies. We predict that by the end of our experiment we will see an increase in HR while watching a horror film and a comedy film.

Materials and Methods

Methods:

- Control: take our pulse once a day for three days during times when we are only sitting down. good thinking ahead!
- Experimental: take our pulse four times total: once in the beginning, once in the middle, once in the end, and once when we believe we're scared/laughing the most. For the middle of Get Smart, the comedy movie, it will be at the 1 hour mark and for Insidious, the horror movie, it will be at the 50 minute mark. This will be done to reduce error in the fluctuations of our HR so we all know we took our pulses at the exact same time.
- Each member of the group will watch the same horror and comedy movies and take their pulse at a predetermined time. Each person will test at the beginning, middle, and end, plus a fourth time the moment they believe their heart rate to be the highest. Before the experiment, each member will take their heart rate for three days to determine their average HR.

Group:	Explanation:
Control	Take pulse 1X a day for 3 days while sitting.
Experimental	Take puse 4X during each movie at the beginning, middle, end, and when we are at our highest emotional state.

Materials:

- Two finger pulse checking
- Heart rate monitor (optional)
- Netflix

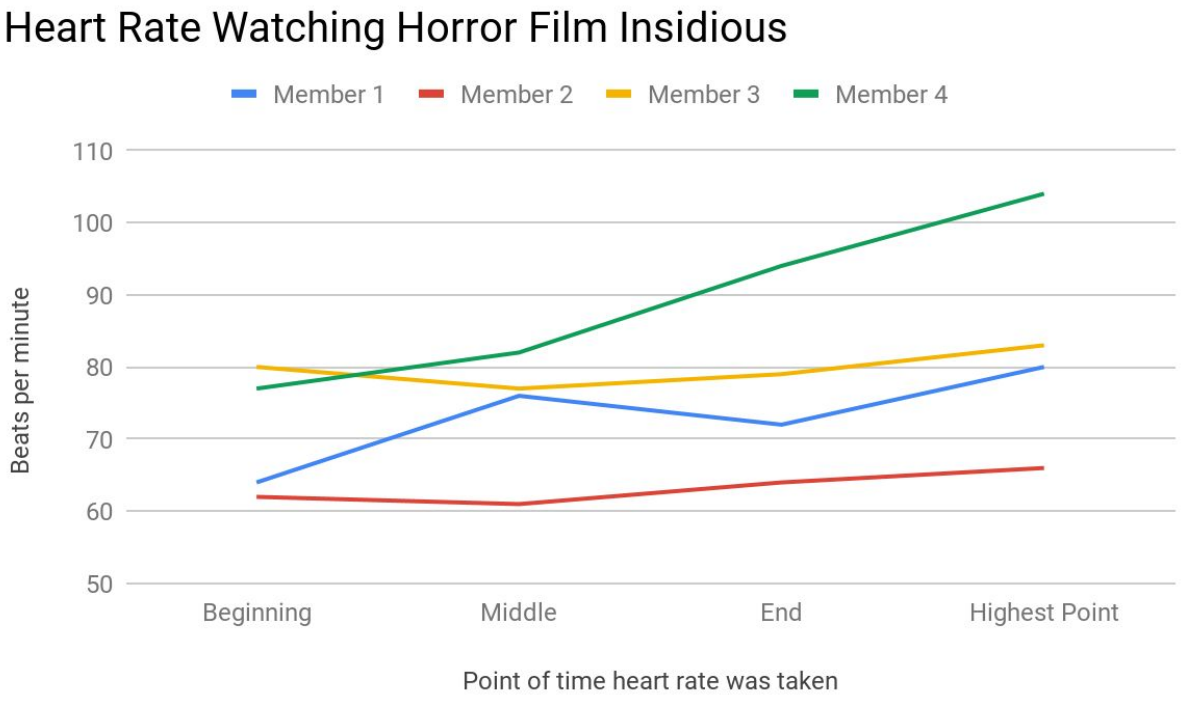
Materials:	Reason for being needed:
Two finger pulse checking	In order to check our heart rate and be used as the primary pulse checking method to not skew data as much.
Heart rate monitor (optional)	To be able to easily check pulse without disrupting film experience as much and using it as a way to confirm heart rate.
Netflix	We needed a source for film watching that all members would have access to.

Tables:

Average HR	Member 1	Member 2	Member 3	Member 4
Day 1	65	60	78	80
Day 2	62	65	83	81
Day 3	60	62	74	80

Film: Insidious	Time	Member 1	Member 2	Member 3	Member 4
Beginning HR	0:00	64	62	80	77
Middle HR	0:50	76	61	77	82
End HR	1:40	72	64	79	94
Highest Point HR		1:07,80	1:22, 66	1:19, 83	0:75, 104

Hypothesis: HR is correlated to fear experience
Member 1: Agrees with the hypothesis. With this member the horror affect HR more because this member doesn't like watching a horror movie.
Member 2: Refutes the hypothesis. A thing to take into account is that this member tends to like to watch a lot of horror movies meaning their heart rate would be more stabilized since it doesn't affect them as much.
Member 3: Agrees with the hypothesis. This member loves watching horror movies, even though she is afraid. This is why her heart rate didn't vary as much, but heart rate did rise during the highest point (scariest part) in the movie.
Member 4: Agrees with the hypothesis. This member had the highest change in heart rate with a 27 change in difference. This member hates and doesn't like watching horror movies, also when watching this movie, had a family member because they didn't want to watch it alone.
Group: Overall, we believe the horror film does support the hypothesis of the more fear you feel, the higher the heart rate.



Film: Get Smart	Time	Member 1	Member 2	Member 3	Member 4
Beginning HR	0:00	68	65	79	66
Middle HR	1:00	72	69	74	69
End HR	2:00	72	70	80	64
Highest Point HR		00:49, 80	0:49, 68	00:44, 81	0:30, 69

Hypothesis: Heart rate is correlated to laughing experience

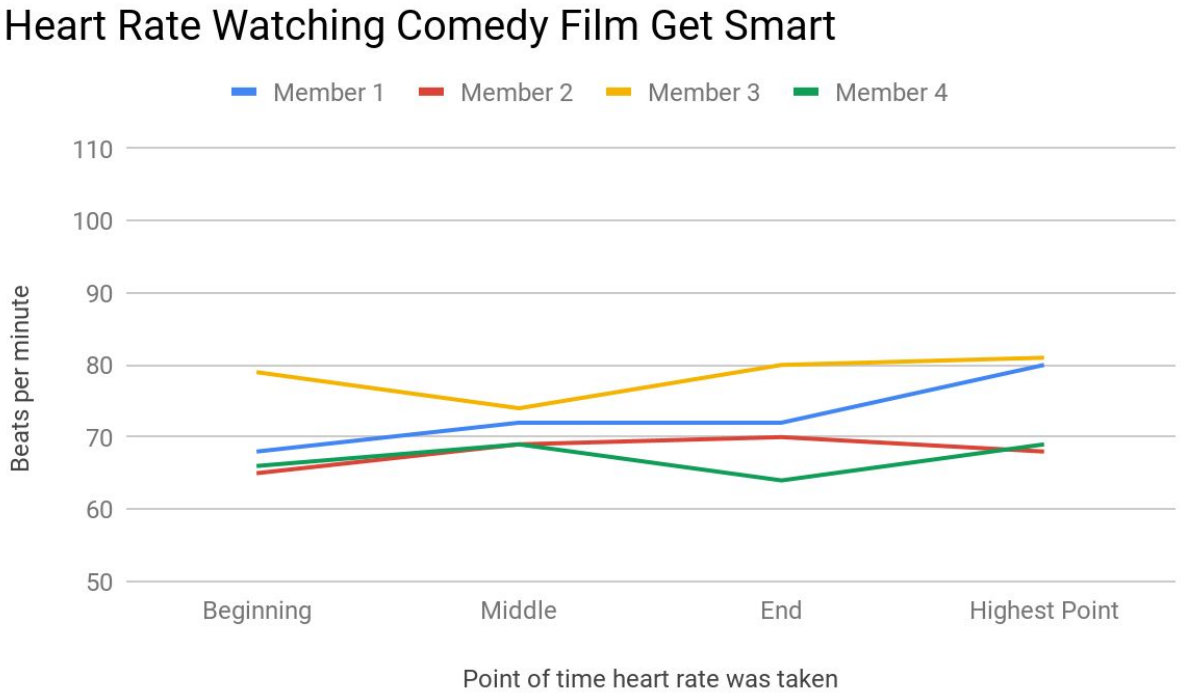
Member 1: Supports hypothesis. This member likes to watch comedy movies, so when there's a part that is super funny it will made her HR rise.

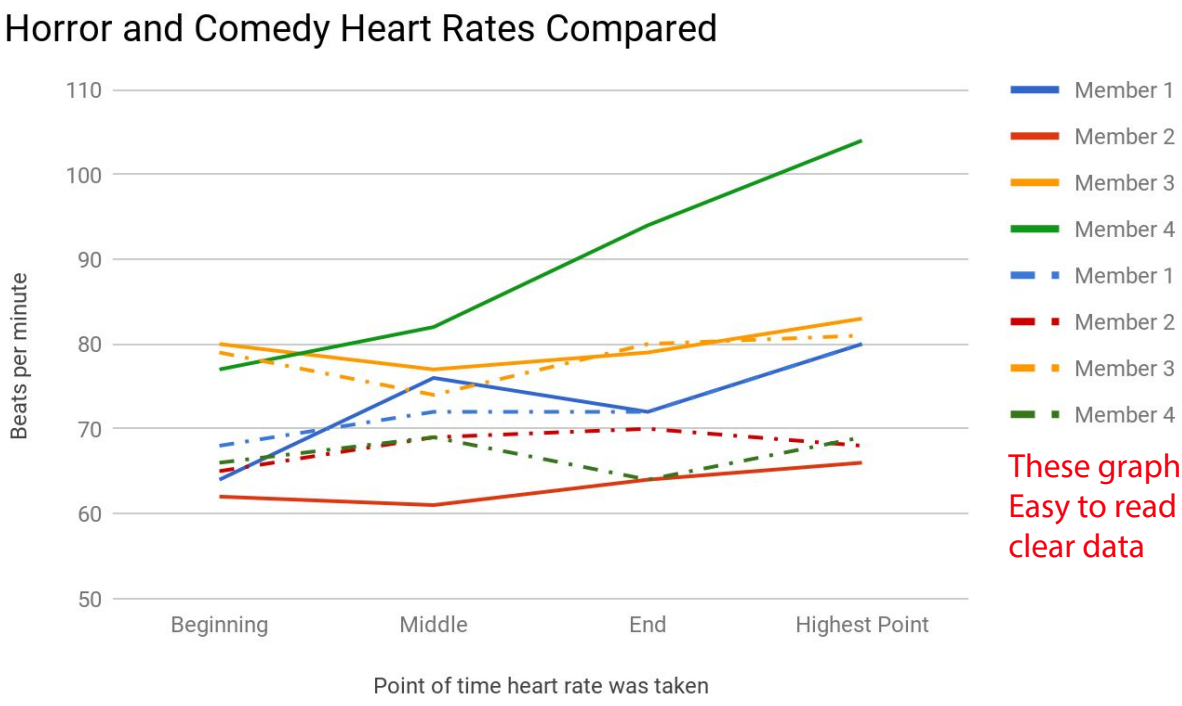
Member 2: Supported the hypothesis. One thing to note for this member is their highest HR was lower than the end HR. This member contributes it to the ending being filled with alot of action around the end, while the highest point was taken in a calmer scene.

Member 3: Supported the hypothesis, her heart rate did raise during the middle and end of the movie, which were the funniest parts of the movie for her.

Member 4 : Don't support the hypothesis. States that the middle of the movie was the funniest part but also the actor is not their favorite, so they weren't too engaged in the movie.

Group: Overall, we believe the comedy one supported the hypothesis since heart rates increased for each member.





These graphs are great. Easy to read and nice, clear data

[Horror and Comedy Heart Rates Compared: Solid lines are for horror. Dashed lines are for comedy]

Discussion and Conclusions

Based on the data collected after watching both the horror and comedy movies, there is a strong correlation that both horror and comedy movie increased the HR, supporting our hypotheses. The horror film did however, increase the HR more than the comedy movie. The reason behind this is that the fear from the horror movie can trigger the sympathetic fight-or-flight response in our cardiovascular system; which increases the HR. This is the strongest pathway since the sympathetic is evolutionarily the first one that was needed in order to stay alive, which is why the horror had a bigger impact. Participants were essentially trying to escape the monsters and death, activating sympathetic cardiac response.

A potential error could have occurred if each of the members did not take their pulse in the predetermined time, therefore the data is not calibrated to make comparisons each person's HR. Also, if either party watched the film with someone else instead of alone then the pulse at the highest point could possibly not show a comparable difference, or the heart rate can be slightly different than what we expected. In addition, having the same pulse taker or pulse monitor would have also reduced error since one person might take their pulses differently than another, even when using the same materials. Having even our optional equipment the same we would still have one proctor take all HR's to calibrate all pulses for comparisons. Based on our findings, we have seen a definite rise in HR with the horror genre and a slight change in comedy. This gives us the impression that physical stimuli is not the only way you can influence the HR.

We purpose if the experiment were to be done again, the volunteers should each watch the films at the same hour of the day while ensuring that they are viewing it alone. This would be done to reduce any extra variables skewing with the data. In addition, the volunteers should document the scenes and/or time they felt fear, or thought a scene was funny. Also using better

methods and tools to take the heart rate would benefit this study such as, using the same device to measure heart rates. After both films finished, the volunteers should be asked which was the highest point for them out of all of the times they mentioned and the researcher would then look at how their heart rate was doing at that chosen time. In addition, there should be more diversity in the experiment. For ours, it was an all female experiment, so it would lead to better results if we had an equal number of males and females to have more reputable results.

Citations and Credit

Blum. J, Scheider. S, Peli. O (Producers) & Wan. J (Director). (2010). *Insidious* (motion picture).

United States & Canada:Blumhouse Productions.

Braff, D. (2019, May 13). Movies may cause special effects on the body. Retrieved from https://www.chicagotribune.com/lifestyles/ct-xpm-2011-06-22-sc-health-0622-movies-impact-on-body-20110622-story.html.

Ewing. M, Gartner. A, Lazar. Andrew, Stern. L, (Producers) & Segal. P (Director). (2008). *Get Smart* (motion picture). United States: Village Roadshow Pictures, Mosaic Media Group, Mad Chance, Callahan Filmworks, & Atlas Entertainment.

Qadir, M. I., & Asif, M. (2019). Does normal pulse rate correlate with watching horror movies? *Journal of Cardiology & Current Research*, *12*(2), (pg.67 -pg.68)

Schmitz. C, Drake. L, Laake. M, Yin. P, and Pradarelli. R. et al. (2012). Physiological Response to Fear in Expected and Unexpected Situations on Heart Rate, Respiration Rate and Horizontal Eye Movements. Retrieved on November 18, 2019.

http://jass.neuro.wisc.edu/2012/01/Lab%20602%20Group%2010%20Final%20Submission.pdf

Stanfield, C. L. (2017). *Principles of human physiology* (6th ed.). Harlow, Essex: Pearson Education Limited. (pg.360)

Stanfield, C. L. (2017). *Principles of human physiology* (6th ed.). Harlow, Essex: Pearson Education Limited. (pg.382- pg. 383)

Sugawara, J., Tarumi, T., & Tanaka, H. (2010). Effect of Mirthful Laughter on Vascular Function. *The American Journal of Cardiology*, 856–859. doi: 10.1016/j.amjcard.2010.05.011

All members contributed equally to the project.