



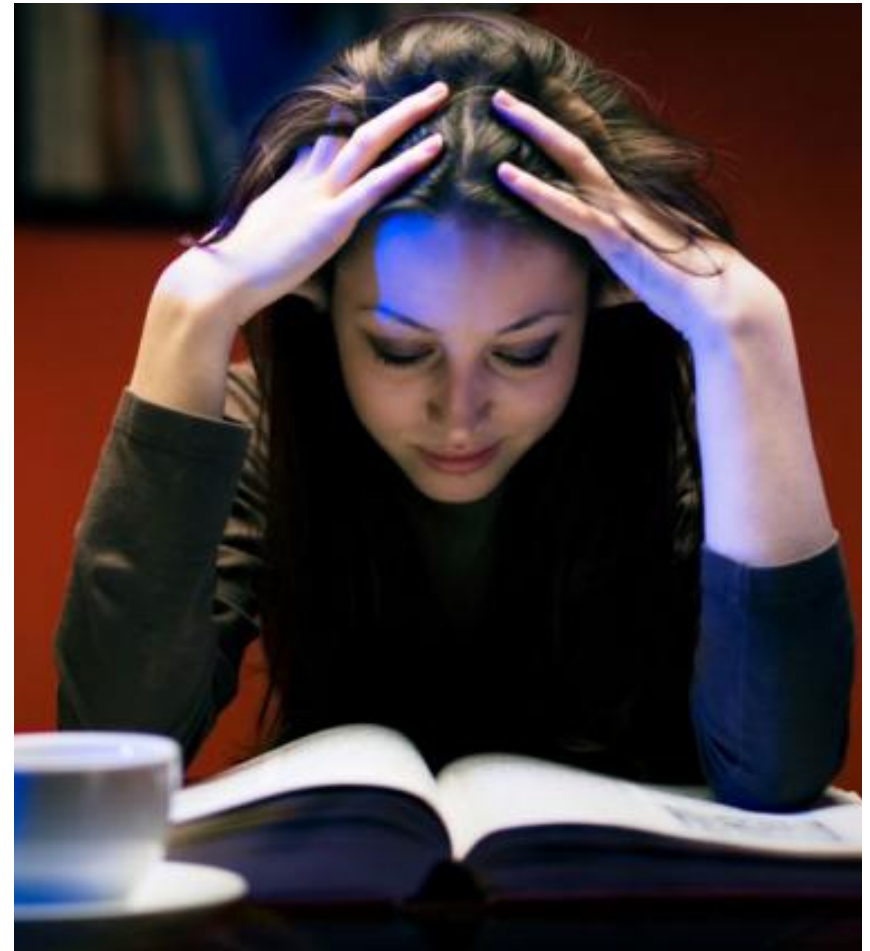
# **The Effects of Different Tempos of Classical Music on the Heart Rate**

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# Motivation

- Students encounter stress from solving problem-sets
- To counteract this stress, they listen to music while solving problem-sets
- What tempo of music is best for reducing stress?

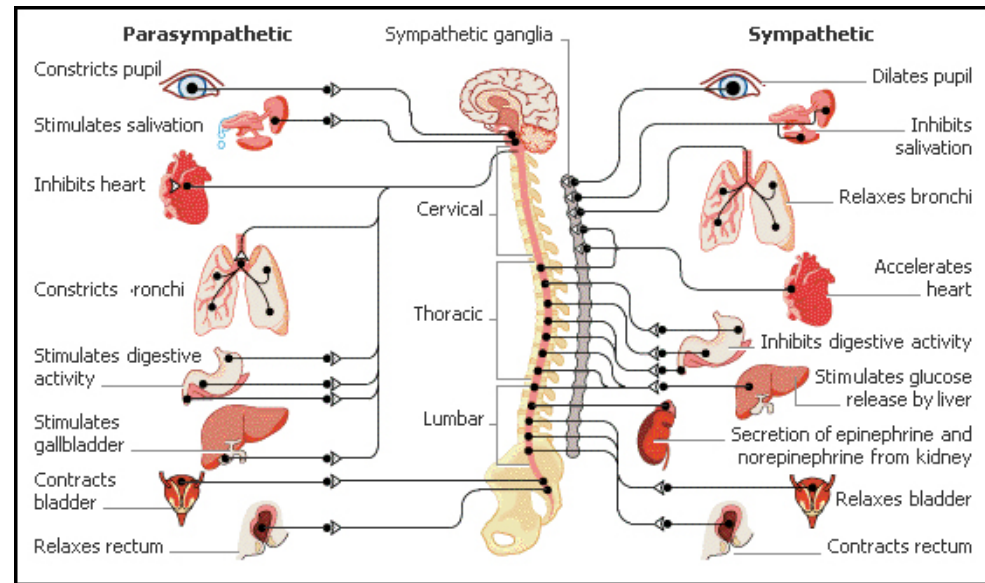


<http://lindseychristine.files.wordpress.com/2009/09/college-student.jpg>

# The Heart Rate

What controls the heart rate when you're stressed?

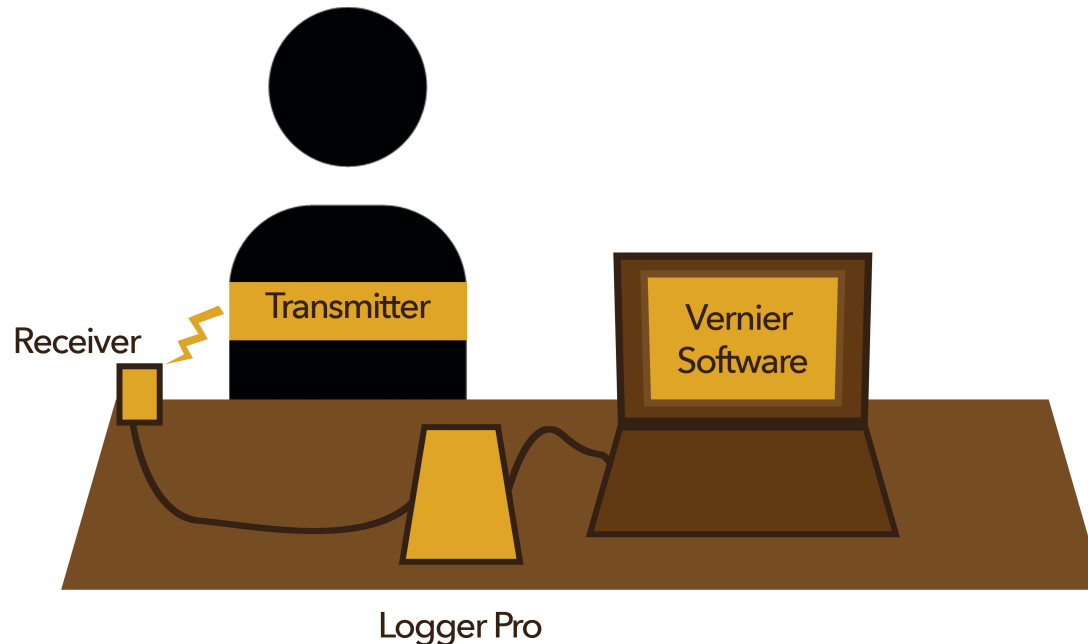
- Autonomic Nervous System
  - Sympathetic Nervous System - the "fight or flight" system
  - Parasympathetic Nervous System - the "rest and digest" system<sup>1</sup>



<http://www.webbiology.com/the-nervous-system>

When stressed, SNS dominates, adrenaline is released, and the heart rate increases.

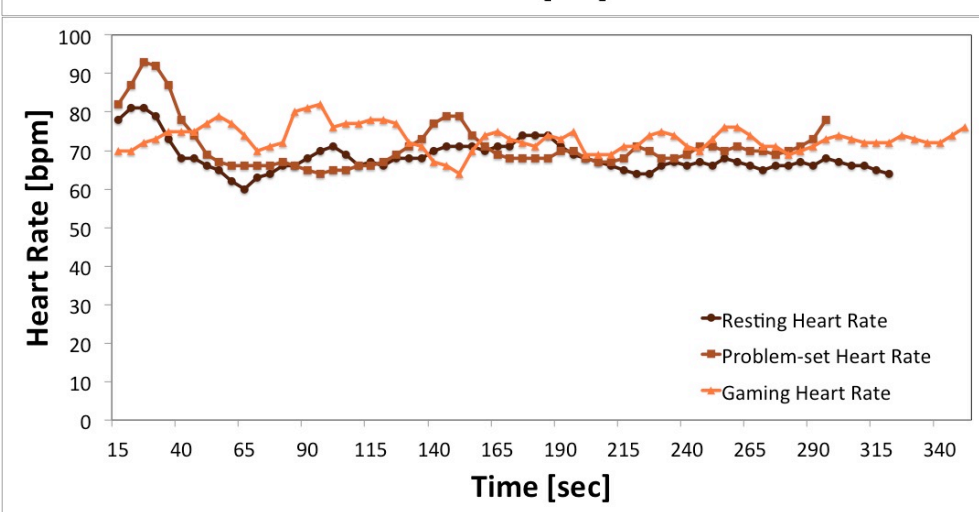
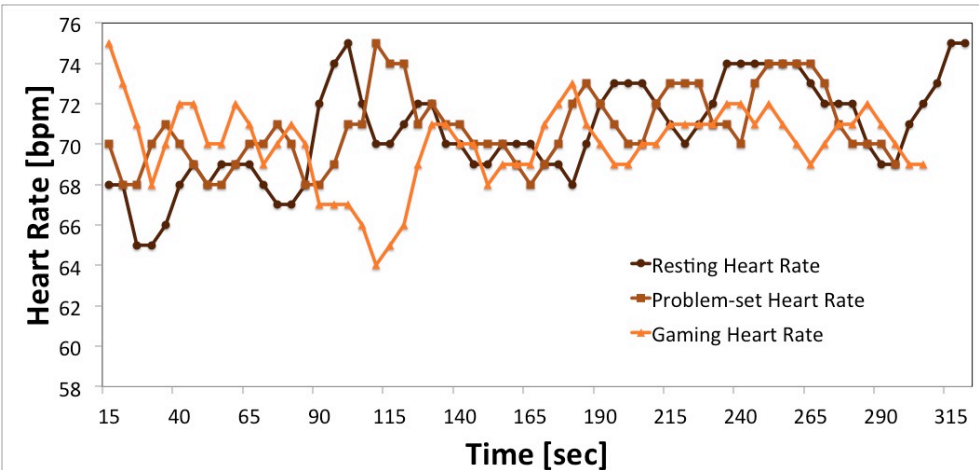
# The Experiment



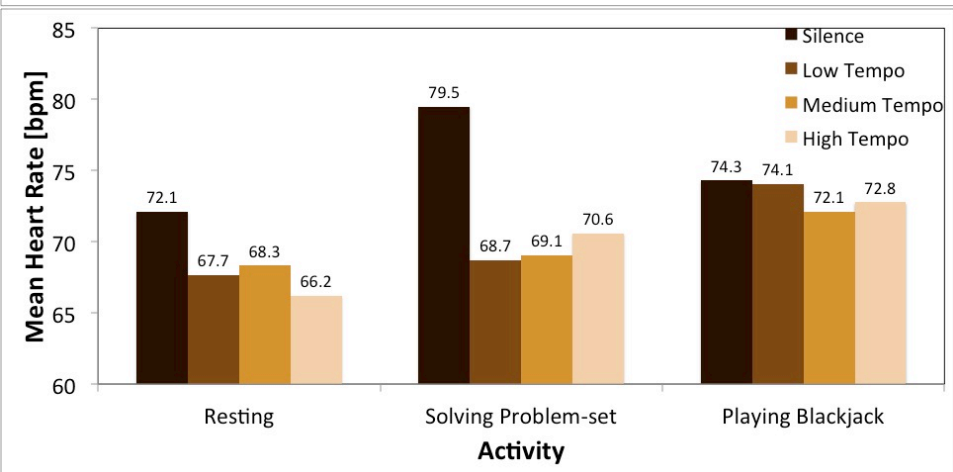
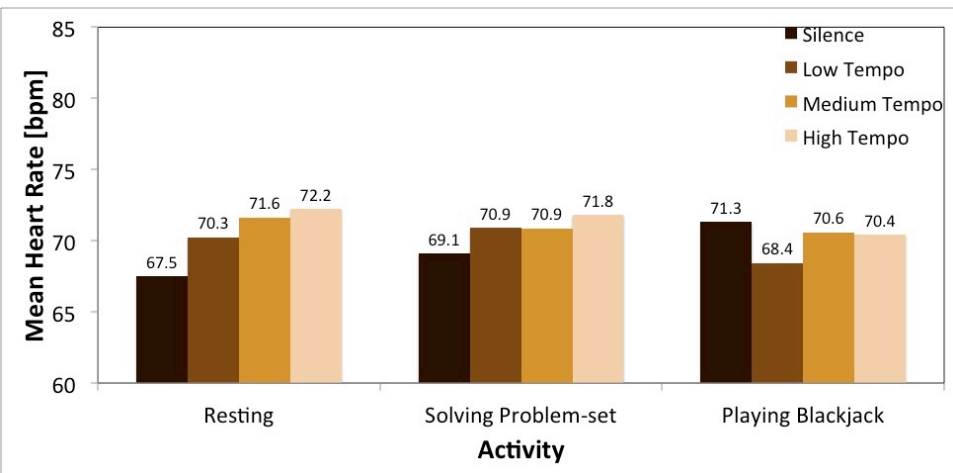
- 5 college students- 4 Male, 1 Female
- 3 activities - resting, solving a problem-set, and playing Blackjack
- 4 musical environments - silence, low, medium, and high tempo classical/instrumental music
- Participants filled out a user survey

# The Experiment

- Heart rates were recorded over time for each participant
- In all, each activity lasted between 6.5 and 7 minutes



# The Analysis



- The average heart rates during each music section were calculated for each student
- A rising heart rate with tempo is defined as the heart rate rising from silence to high tempo or from low to high tempo

# Conclusions

- Key Findings:
  - 2/5 participants had an increasing heart rate with increasing tempo for all three activities
  - 5/5 participants had an increasing heart rate with increasing tempo while solving a problem-set
- Conclusion:
  - Not all students are affected in most activities by music tempo
  - To reduce stress while working, students should work either in silence or with low-tempo classical/instrumental music

# Possible Improvements

- Add measurement of skin conductance or blood pressure
- Change music so differences in tempos are more drastic



# References

1. The Science of Stress, Heart Rate and Breathing (2013)