

## Lab Report 11

**Purpose:** The reason for this lab experiment was to understand and know what the heart rate is doing during certain circumstances.

**Procedure:** Demonstration of a measure of physical fitness

1. Select three students who exercise regularly and three students who do not. Each student will take his/her resting pulse rate for one minute and record this value.
2. Each student will then run the track twice at a fast but comfortable pace.
3. Immediately upon returning to the laboratory, each student will record his/her pulse after exercise.
4. Each student will take his/her pulse at one minute intervals until the resting pulse is reestablished.  
(NOTE: The best method to employ is to take the pulse rate for 15 seconds and multiply by 4.)
5. These results will be recorded on the chalkboard for discussion. Is there a difference between the exercisers and the non-exercisers? Which student(s) do you consider to be in better physical condition? Why?
6. Determine the target heart rate range for each student (if the ages are available) and for yourself. The target heart rate range determines the heart rate that should be maintained for 20-30 minutes, at least 3 times per week for cardiovascular fitness. To determine your target heart rate range do the following calculations for the Karvonen formula (only use numbers rounded off to whole numbers):  
a.  $220 - \text{your age} = \text{maximum heart rate (max HR)}$   
b.  $\text{Max HR} - \text{resting HR} = \text{HR reserve}$  (to find your resting heart rate, take your pulse before getting out of bed each morning for three days and then take the average)  
target heart rate range =  $(\text{HR reserve} \times 60\%) + \text{resting HR} = \text{low target heart rate}$   
 $(\text{HR reserve} \times 80\%) + \text{resting HR} = \text{high target heart rate}$   
Example: 20 year old with a resting heart rate of 65 beats per minute  
 $220 - 20 = 200$  (max HR)  
 $200 - 65 = 135$  (HR reserve)  
 $(135 \times 60\%) + 65 = 81 + 65 = 146$   
 $(135 \times 80\%) + 65 = 108 + 65 = 173$   
This student's target heart rate range would be 146–173 beats per minute.
7. Include your calculations for your target heart rate in the results section of your report.
8. Evaluate the class results in terms of target heart rate and level of fitness for everyone.

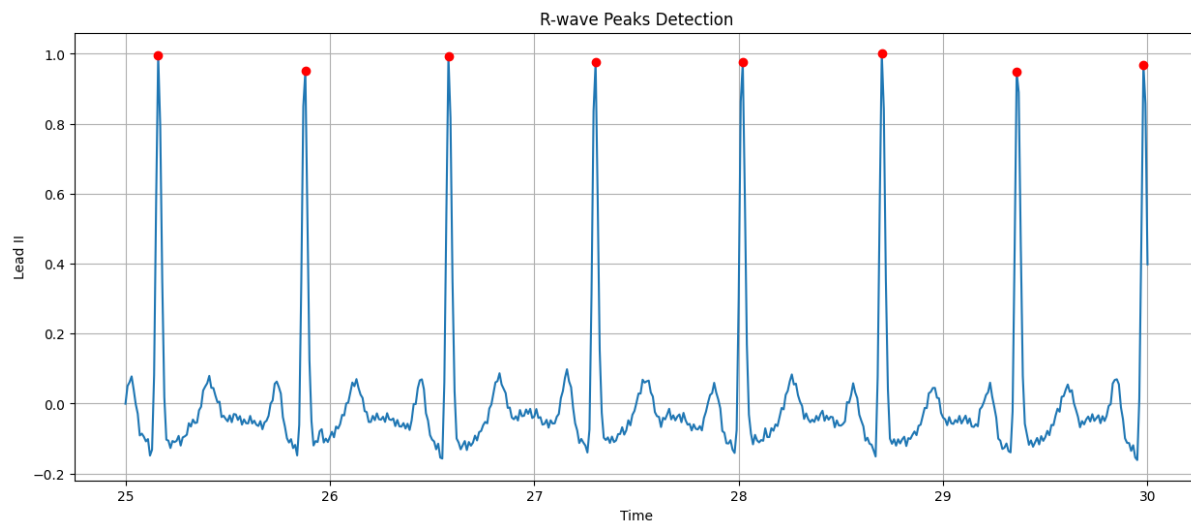
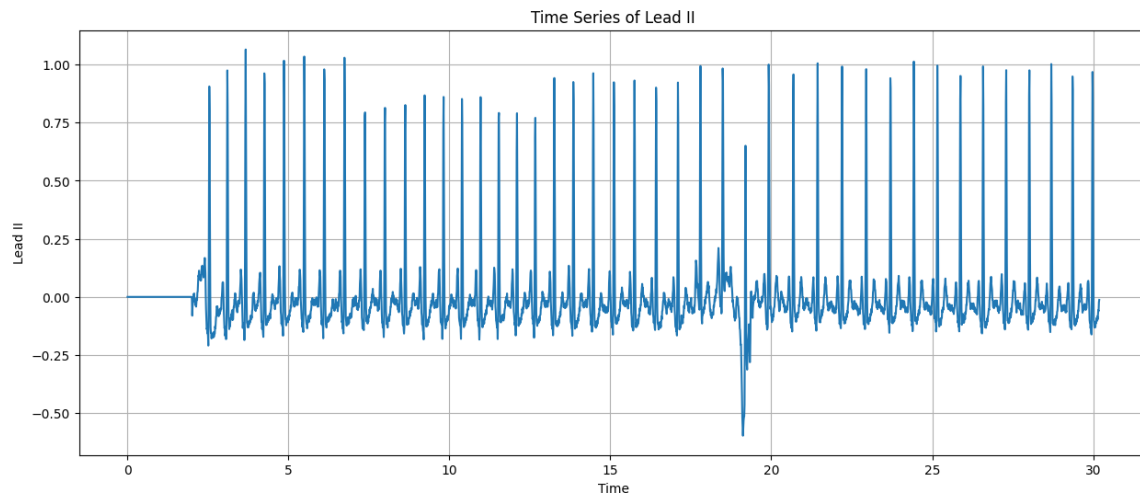
### Divers Response

1. Fill a large tub with ice cold water.
2. Select one student volunteer and hook him/her up to the computer.
3. Recordings of a Lead II ECG and pulse pressure from a thumb will be obtained with the student at rest for a baseline measurement
4. Recordings will then be taken with the student holding his/her breath for at least 20 seconds, hopefully for 30 seconds.
5. The experiment will be repeated with the student holding his/her breath and placing his/her head into a bucket of ice-cold water.

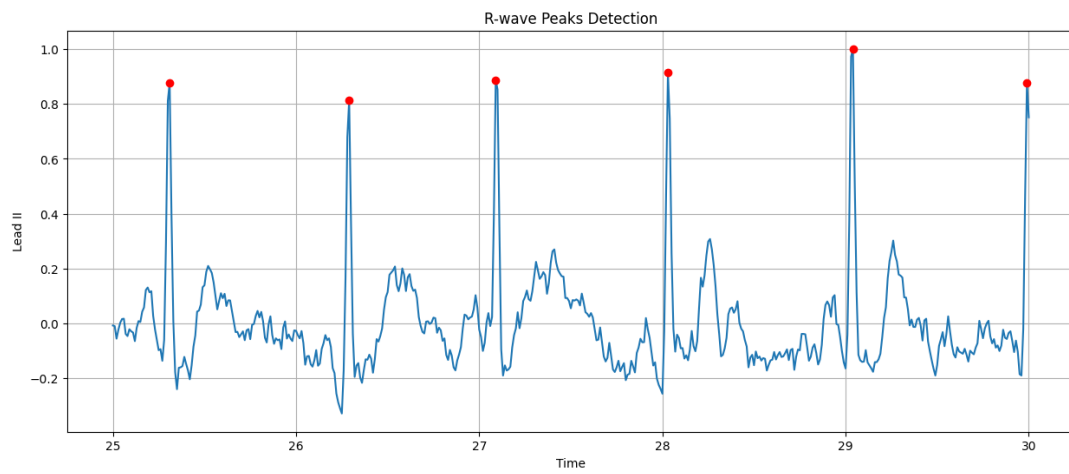
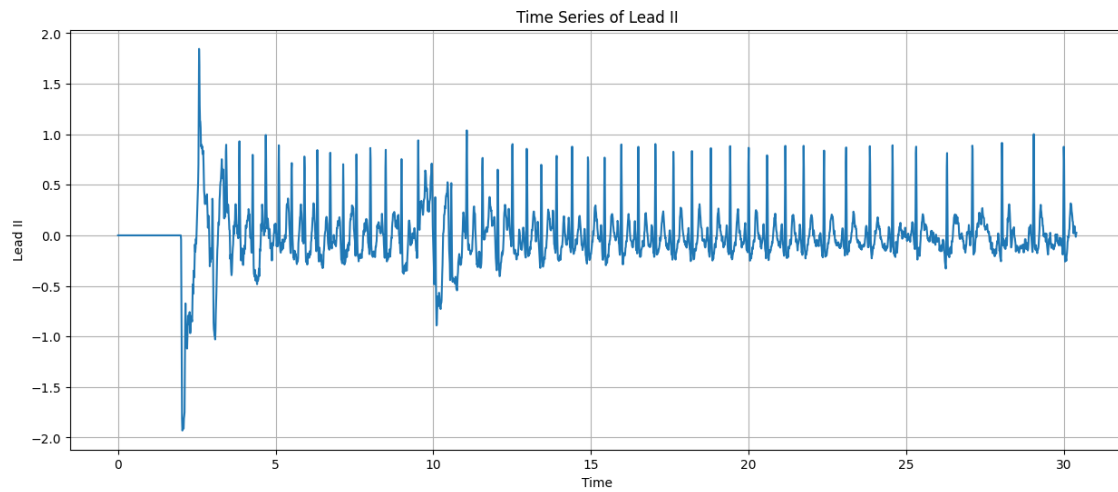
6. Include copies of the results in your lab report.

7. Evaluate the three sets of data in terms of the bradycardia and vasoconstriction. What are the adaptive advantages of these reflexes?

Results:

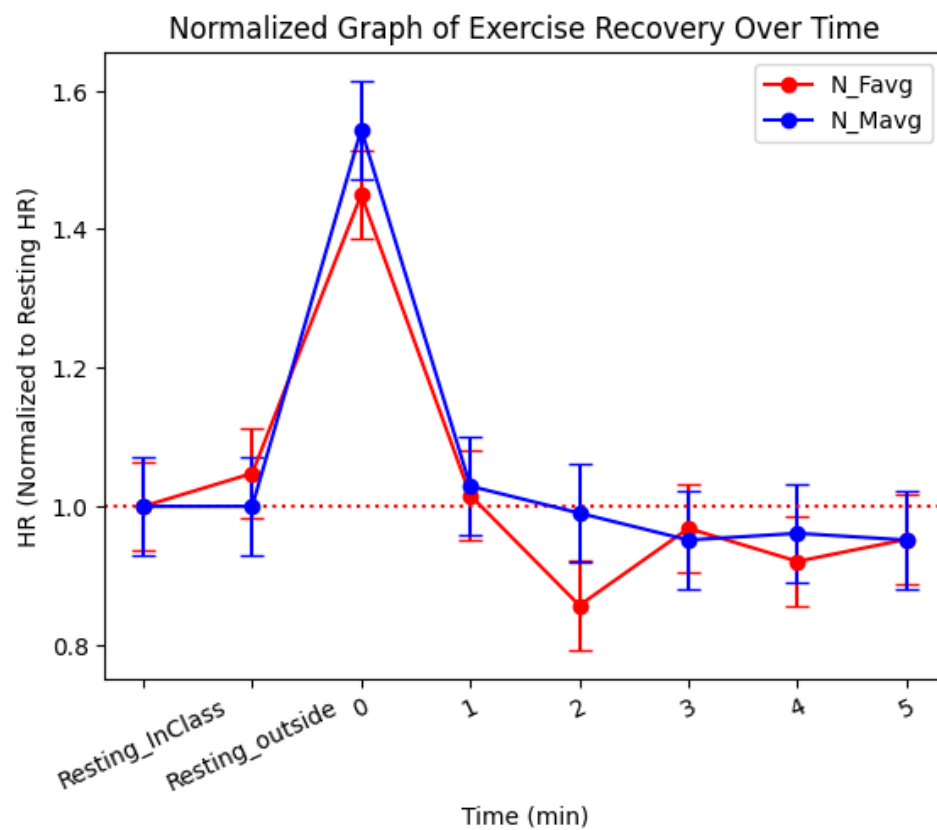
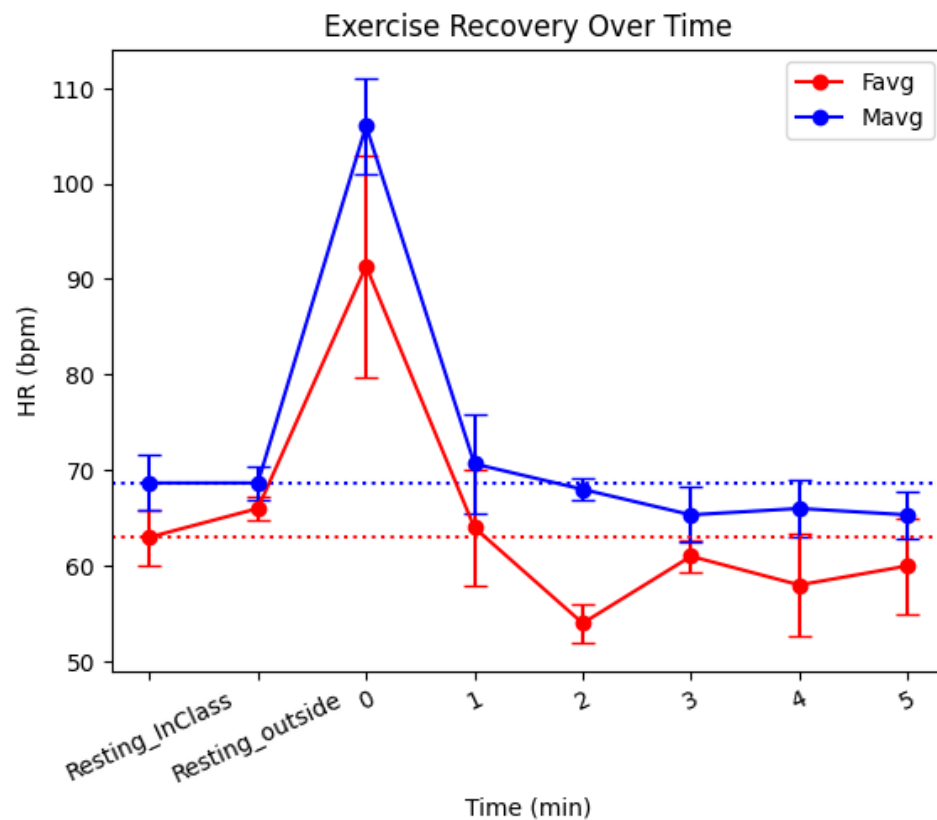


Average RR interval in the window: 0.69 seconds Heart rate in the window: 87.14 BPM

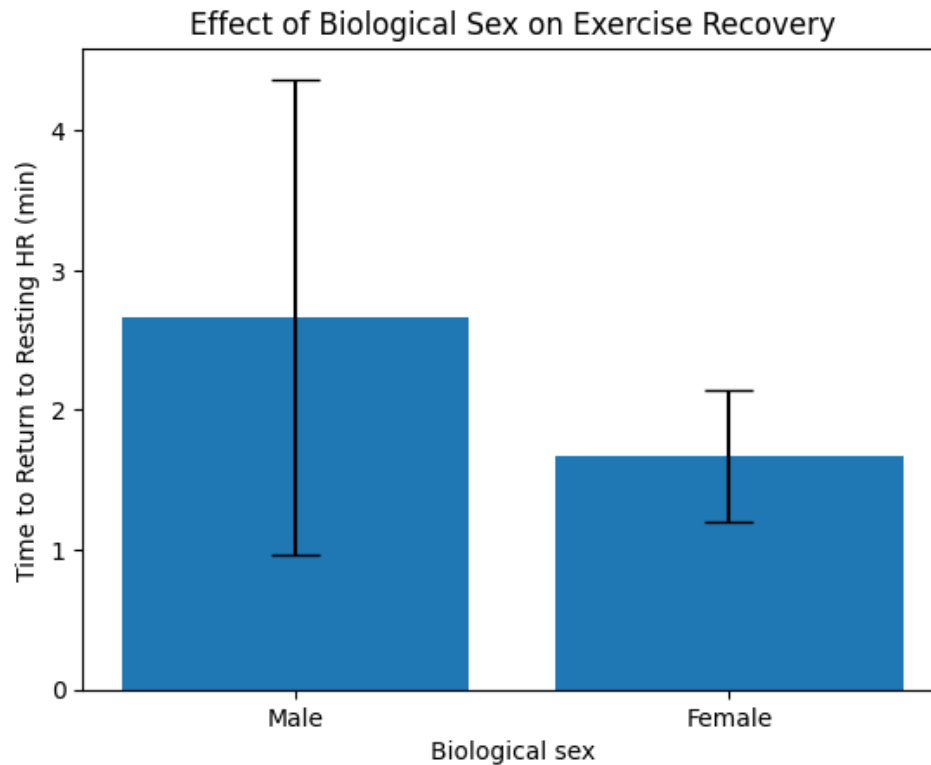


output

Average RR interval in the window: 0.94 seconds  
Heart rate in the window: 64.10 BPM



Time to reach ~resting HR (set to: 64) for the male 1 was: 5 minutes Time to reach ~resting HR (set to: 74) for the male 2 was: 2 minutes Time to reach ~resting HR (set to: 68) for the male 3 was: 1 minutes Time to reach ~resting HR (set to: 58) for the female 1 was: 2 minutes Time to reach ~resting HR (set to: 68) for the female 2 was: 1 minutes Time to reach ~resting HR (set to: 63) for the female 3 was: 2 minutes



TtestResult(statistic=0.8017837257372731, pvalue=0.46760475460939743, df=4.0)

Discussion: The results concluded the differences between female vs male heart rates when exercising and when doing the divers response.

Conclusion: During the diver's response, we see that our receptor's get captured when that moment we hit the cold water.

The heart rate rest times show that, it took the biological females less time to get back at a good resting rate. While males took them more to get to a good resting rate.

