

4-1-2017

Effect of Caffeine on Heart Rate and Calories Burned During Exercise

Steven E. Franco
Parkland College

Luis A. Galvan
Parkland College

Ronny M. Olvera
Parkland College

Malcom J. Taylor
Parkland College

Recommended Citation

Franco, Steven E.; Galvan, Luis A.; Olvera, Ronny M.; and Taylor, Malcom J., "Effect of Caffeine on Heart Rate and Calories Burned During Exercise" (2017). *Kinesiology* 288. 6.
http://spark.parkland.edu/kin288_students/6

Open access to this Poster is brought to you by Parkland College's institutional repository, [SPARK: Scholarship at Parkland](#). For more information, please contact spark@parkland.edu.



Effect of Caffeine on Heart Rate and Calories Burned During Exercise.

Luis Galvan, Jared Peters, Ronny Olvera, Malcolm Taylor and Steven Franco

Parkland College, Champaign, IL

ABSTRACT

Four active collegiate level students were asked to participate in a 3 day study, conducted in a strict environment. These students were required to perform the same exact exercise each day at the same time upon waking on an empty stomach following a fasted sleep. All individuals performed the exercise at 7:00 AM. On day one, the participant was to perform the exercise with no caffeine consumption. The following day, the participant was to drink one cup of coffee and perform the required exercise. On the last day of the experiment, each participant drank two cups of coffee before the exercise was performed. The exercise was one mile of walking on a flat treadmill at a speed of 3.5mph. These individuals were wearing a Garmin fitness watch and the heart rate strap that was included in the packaging. Immediately following exercise, these individuals took note of both their heart rate and calories burned. The basis of this study is to show the effects of caffeine on calorie burn and heart rate fluctuation. Following this study, it is important to note that all four participants showed a slight increase in both calories burned and heart rate following the required exercise on each day. The average calories burned with no caffeine was 109.25 and a heart rate of 103 beats per minute. When one cup of coffee was consumed by each individual, the average readings were 118.5 calories burned and a heart rate of 110.25 beats per minute. On the third and final day, the averages were 123.75 calories burned and a heart rate of 120 beats per minute. Thus, proving that caffeine consumption before exercise can help increase heart rate and in return burn more calories. This information can be especially helpful to all individuals trying to lose weight.

OBJECTIVES

- Create an accurate research
- Understand the relationship between heart rate and calories burned.
- Analyze data from graphs.

METHODS

Four young college men between the ages of 19 and 22 partook in a research study designed to show the effects of caffeine on total calories burned and heart rate.

These individuals performed 1 mile of walking on a treadmill with zero incline and a constant speed of 3.5mph. The study ran for 3 days and the participants were to do the exercise upon waking up on an empty stomach. Following a fasted state, this would ensure that the data would be as accurate as possible. Data was taken immediately following the completion of the exercise required.

On the first day, the individuals performed with no caffeine. The second day, 1 cup of black coffee containing no additives. (Sugar, creamer, etc.) Lastly, on the final day each individual consumed 2 cups of coffee before performing the exercise.

	Day 1	Day 2	Day 3
Participant 1	0 Cups of Coffee	1 Cup of Coffee	2 Cups of Coffee
Participant 2	0 Cups of Coffee	1 Cup of Coffee	2 Cups of Coffee
Participant 3	0 Cups of Coffee	1 Cup of Coffee	2 Cups of Coffee
Participant 4	0 Cups of Coffee	1 Cup of Coffee	2 Cups of Coffee

Once data was compiled, there were a few things worth noting:

-A single cup of coffee increased the heart rate and calories burned in all four individuals slightly.

(Avg. calorie increase-9.25 kcal./avg HR increase- 7.25 BPM)

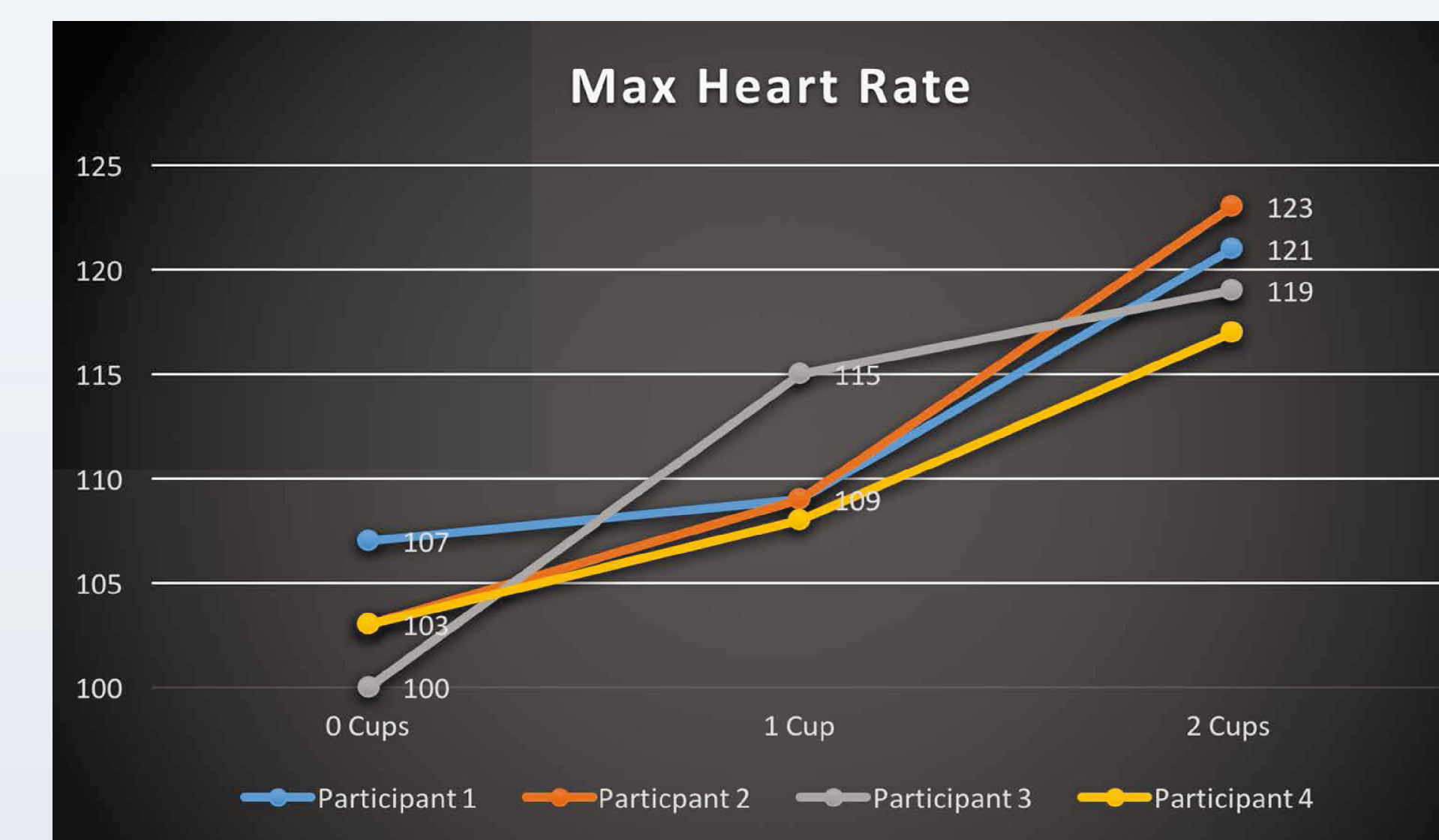
-As expected, consumption of two cups of coffee caused an even greater increase in calories burned in all four individuals.

(Avg. calorie burn increase-14.50 kcal./avg HR increase-9.75 BPM)

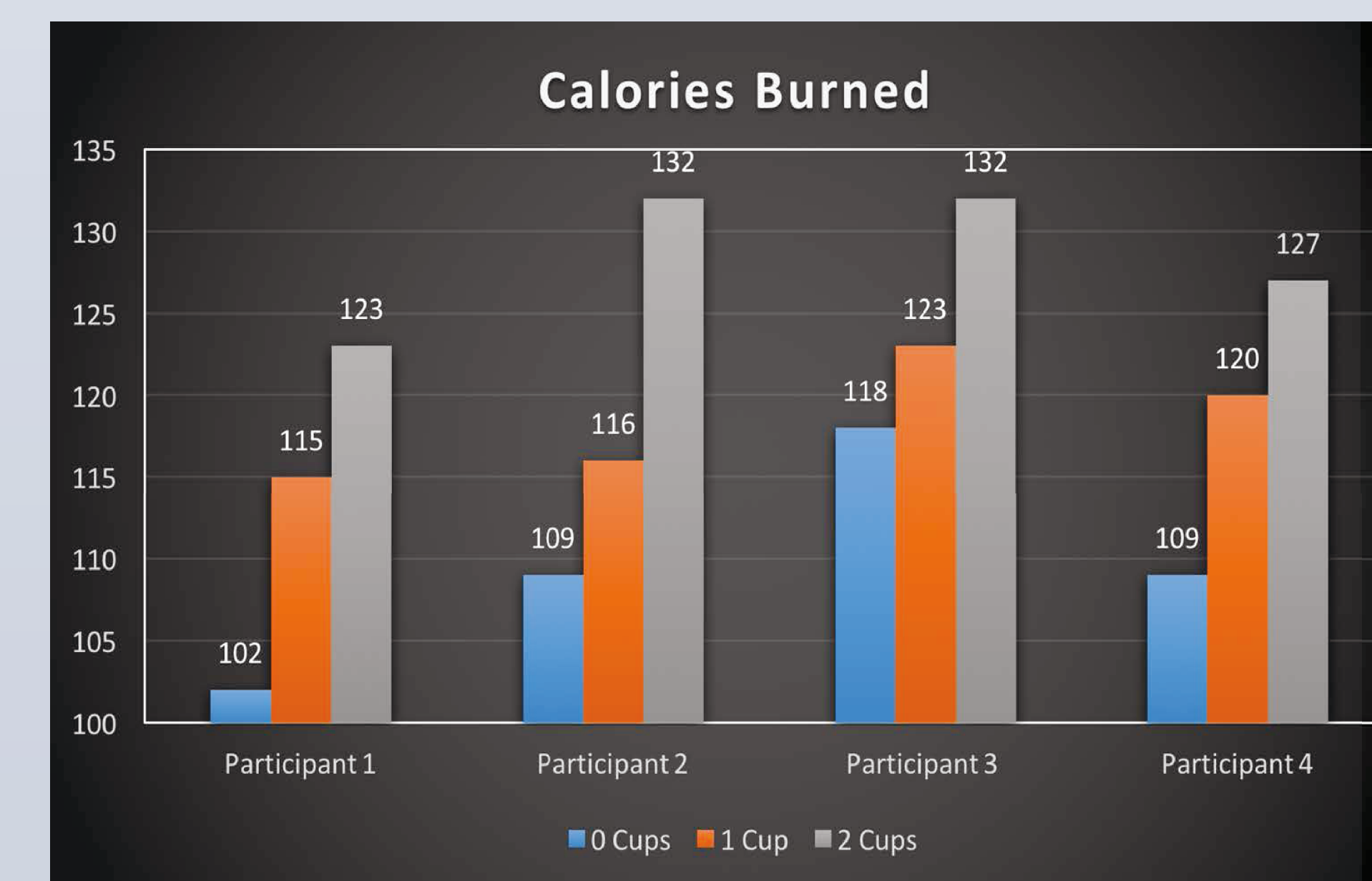
-caffeine does in fact have an effect on calorie burn and heart rate fluctuations when consumed prior to exercise—even at a very light/moderate pace.

RESULTS

All four participants showed an increase in max heart rate after consuming caffeine. Each time the amount of caffeine increased the heart rate showed a positive relationship and increased as well.



As well as for the max HR, the amount of calories showed a positive correlation. This confirms that caffeine consumption before exercise at any rate of exertion causes an increase in both heart rate and calories burned.



CONCLUSIONS

According to the results, there were in fact some fluctuations in both heart rate and calories burned following caffeine consumption. The fact that this research was recorded after each of the four participants were coming off of a fasted state, and adequate sleep schedule; It showed the most accurate results for this type of research. Not only can this research apply to athletes or young adults, but it can simply be applied to anyone with the desire to burn calories at a faster rate, which will eventually lead to losing weight. According to Emily Lee Chan drinking coffee stimulates the metabolism, contributing to the burning of fat. In relation to the amount of caffeine consumed by each individual, it was proven to show that the higher the dose of caffeine led to a more significant increase in heart rate as well as calories burned. It is safe to say that caffeine consumption does take an effect in increased heart rate and calories burned during exercise.

REFERENCES

1. "Effect of Caffeine Intake on Blood Pressure and Heart Rate Variability After a Single Bout of Aerobic Exercise." *International Sportmed Journal*, vol. 13, no. 3, Sept. 2012
2. "Effects of Time-Release Caffeine Containing Supplement on Metabolic Rate, Glycerol Concentration and Performance." *Journal of Sports Science & Medicine*, vol. 14, no. 2, June 2015
3. "Accuracy of a Combined Heart Rate and Motion Sensor for Assessing Energy Expenditure in Free-Living Adults during a Double-Blind Crossover Caffeine Trial Using Doubly Labeled Water as the Reference Method." *European Journal of Clinical Nutrition*, vol. 69, no. 1, Jan. 2015
4. Chan, Emily L. "Does Drinking Coffee before Exercise Really Increase Calorie Burn." *Quora*. N.p., 1 June 2015. Web. 20 Apr. 2017.