The Corinthian

Volume 18 Article 8

June 2017

Exercise Motivation in College Students

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Abstract

Purpose: Learning what motivates people to exercise may be the key to health professionals helping their clients become more active and moving our society in a positive direction in terms of health. Motivation can be divided into two broad categories; intrinsic and extrinsic. Our study sought to examine which type of motivation positively affects college-aged students' one-mile times. It was hypothesized that college-aged individuals would run one mile in a shorter amount of time if they were motivated extrinsically than if they were motivated intrinsically.

Methods: Eighteen college-aged individuals participated in the study and were randomly split into two groups: intrinsic motivation and extrinsic motivation. On day one all participants performed a baseline, one-mile run timed trial with no motivation administered. On day two subjects were asked to repeat the one-mile time trial; however, this trial included a motivation condition (extrinsic or intrinsic) based on which of the two groups the participants were randomly assigned.

Results: An independent t-test revealed no significant differences in final one-mile run time between the extrinsic group (7.5 ± 1.4 min) and the intrinsic group (7.7 ± 1.5 min). Survey results revealed that trophies, recognition, self-satisfaction, and health ranked the lowest of motivating factors while money and fitness ranked the highest.

Conclusion: Although there was no statistical significance supporting one type of motivation over the other; the survey results suggests that college students are not intrinsically motivated to exercise, and only certain extrinsic rewards such as fitness and money were reported to be "motivating" to exercise.

Introduction

Cardiovascular disease (CVD) consists of heart valve problems, arrhythmias, heart attacks, and stroke. Having a plaque buildup in your arteries and cardiac valves can cause many of these problems because it is harder for blood to flow them. Arteries can stiffen by arteriosclerosis and cannot expand effectively so therefore the blood pressure of an individual will rise. Atherosclerotic plaque buildup can trigger many things including thrombosis and about 25% of people over the age of 50 experience this venous blockage by thrombosis (Abela et al., 2016). The negative effects of atherosclerosis and hypertension can lead to a risk of stroke (Saladin, 2007). CVD is the number one cause of death in the United States (Yu et al., 2016). There are genetic factors that can predispose a person to CVD, but there are simple lifestyle changes that can greatly decrease the likelihood of developing CVD. Exercise and nutrition have well established positive effects on the cardiovascular system: decreasing risk of heart attack, lowering percent body fat, and increasing metabolic tissue, to name a few (Petrella, Lattanzio, Demera, Varallo, & Blore, n.d). Despite the overwhelming positive aspects that diet and exercise can have on CVD risk, there are still many individuals who do not make an effort to improve lifestyle choices.

Often an individual's risk for the development of CVD depends upon whether they possess a certain set of modifiable and non-modifiable risk factors. One such non-modifiable risk factor for CVD is age, specifically, 45 years of age for males and 55 years of age for females (Villegas-Rodríguez et al., 2016). Although the majority of people with CVD are older, more than half of college-aged adults 18-24 have at least one risk factor of CVD (Fernandez & Lofgren, 2014). In addition to age contributing to an individual's risk for developing CVD, obesity is also known as a risk factor. Obesity rates have more than doubled in children and more than tripled in adolescents in the past 30 years (Jianxing et al., 2016) Furthermore, for every year a person is obese, they increase their chance of developing CVD by 2-4% (Fernandez & Lofgren, 2014). Because many young adults exhibit signs for at least one CVD risk factor, screenings and early prevention during childhood are recommended to help decrease the likelihood of CVD and coronary heart disease (CHD) in the future. Prevention can come in the form of nutrition and exercise; healthy lifestyle habits are effective means to preventing CVD in later years.

Exercise has a major impact on an individual's health status. Physical activity can help decrease the prevalence of many diseases and health conditions from which an individual could potentially suffer. Cardiovascular disease is one

of the biggest health concerns associated with limited exercise; the two are directly correlated. It has been found that "an inactive lifestyle is a high-risk factor for cardiovascular disease" (Huang, Huang, Li, Wang, Chen, & Tang, 2014). According to many studies, an increase in physical activity causes a decrease in the prevalence of developing CVD risk factors (Rasiah et al., 2015). Exercise is important in maintaining a healthy lifestyle while also decreasing the risk of developing CVD. Rasiah and colleagues found that individuals who participated in physical activity of moderate intensity had a small likelihood of having three or more cardiovascular risk factors (Rasiah et al., 2015). Overall, exercise and an increase in physical activity can lead to a decrease in developing CVD.

There are recommendations regarding how much exercise an individual should perform on a daily basis. The main difference in the times is based on a number of factors including the type of exercise and the ultimate goal of getting physically active. According to the American College of Sports Medicine, an individual should participate in 30 minutes of moderate intensity physical activity at least five days a week, or an individual should perform vigorous intensity exercise for 20 minutes a day at least three days a week (Pescatello, Arena, Riebe, & Thompson, 2014). An individual can also participate in a combination of moderate intensity and vigorous intensity physical activity in order to meet the daily recommendation of exercise. Individuals who participate in more vigorous physical activity or who participate in longer durations of physical activity can have even more health gains than those who do lesser amounts (Pescatello, Arena, Riebe, & Thompson, 2014). By following the recommended guidelines for exercise, one can increase their fitness, decrease their risk of developing any chronic diseases, and maintain a healthy weight. Exercise has many health benefits that one can achieve by following the recommended guidelines for physical activity.

In order to get individuals physically active and improve overall health, it is important to understand what factors motivate them. Motivation is categorized in two forms: intrinsic or extrinsic. Intrinsic motivation is finding satisfaction and pleasure in the activity itself coming from participation alone. Extrinsic motivation refers to having a means to an end or doing something in order to reap a benefit such as improved physique or improved health status (Vallerand, 2007). Most physical activities are motivated by both intrinsic and extrinsic factors. It is often a matter of attraction to the activity whether or not the motivation is intrinsically or extrinsically inclined. Determining whether an individual's motivation is intrinsic or extrinsic usually has to do with that individual's attraction to the activity. According to a study focusing on intrinsic motivation and exercise adherence, people were more likely to stay motivated in an exercise class if there was a higher level of enjoyment and competence. However, when

the individuals were not as interested in the class, their motivation was based mostly on body image and the end result of the class, characterizing it extrinsically. These latter individuals were less likely to stay in the program (Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997). From the reviewed literature, it is clearly defined that exercise can play a positive role in warding off CVD. It has also been shown that motivational factors have a major role in whether an individual adheres to exercise. Therefore, the purpose of the present study was to assess the effects that intrinsic and extrinsic motivation have on a performance of a one-mile run. It was hypothesized in an article by Ryan, that college-aged students would run faster mile times when they are motivated extrinsically (Richard, Christina, Deborah, Rubio, & Kennon, 1997).

Methods

Participants

In order to broaden the understanding of different motivating techniques for exercise in young adults, this study assessed the effects that intrinsic and extrinsic motivation had on a one-mile run performance in college-aged individuals. Participants were included in the study if they had the following characteristics: 19-25 years of age, if they were seemingly healthy (based on health screening questionnaire described below), and if they were not currently a college athlete. Participants that indicated any sign or symptoms suggestive of cardiovascular, pulmonary, or metabolic disease, or any other condition that would prohibit them from safely participating in exercise (based on the health questionnaire form) were excluded from the study.

Data Collection

Interested individuals were contacted via email with a health screening questionnaire, American College of Sports Medicine (ACSM) Health/Fitness Facility Pre-participation Screening Questionnaire (American, 1998) in order to ensure their eligibility. Once their eligibility was confirmed, they sent an email with an invitation to the testing facility on a designated date and time. In this email, participants received an informed consent document to read over prior to their first appointment. Participants were asked to arrive to the testing location having done the following: completed a three-hour fast (no food or beverage, with the exception of water), avoided the use of nicotine for at least four hours, and avoided strenuous exercise for at least 24 hours. Participants were also asked to wear athletic shoes and loose comfortable clothing. Upon arrival to their first designated appointment, participants were given the opportunity to express any questions or concerns regarding their involvement in the study. After that point, participants completed an informed consent document and a set of surveys assessing their health history, health risks, and current physical fitness levels.

Participants then completed a series of health assessments. Prior to

beginning these assessments, the investigator completed a Physical Activity Readiness Questionnaire and a Health and Fitness Pre-participation Screening Questionnaire (ACSM, 1998) to ensure the participants' safety proceeding with the exercise portion of the investigation. These assessments included: resting heart rate and resting blood pressure.

Following preparatory assessments and instructions, the participant then completed a warm up that consisted of walking one lap around a track (equating to approximately two minutes). Next, the participant lined up at the designated start position on the track to begin the timed one-mile run. Participants were asked to run the one-mile with their "best effort". After the completion of the one mile, the participant was instructed to perform a cool down by walking 1-2 laps (equating to 3-5 minutes). After the cool down, the investigators reexamined the participant's blood pressure and heart rate to ensure these variables were within safe range before dismissing the client. The timed performance on day-one of data collection served as a baseline for the second day of data collection.

After completion of day-one data collection, subjects were randomly placed into one of two groups (A or B). The group placement determined the activities that were performed on day-two of data collection. Both groups were asked to repeat a one-mile run; however, each group was motivated differently. Group A (intrinsic motivation) was told to, "do you best to improve your mile time". Group B (extrinsic motivation) was given the opportunity to win an undisclosed prize if they improve their timed mile. The investigator once again recorded resting vitals prior to the exercise bout. The participant then completed their warm up lap and repeat the procedure to start their timed mile run as was done on day-one. Following the mile run, the participants completed the same active cool down process as in day-one. The participants' vitals were reassessed after the completion of the cool down regime. Group B was rewarded with a free food item coupon if their mile time improved. To conclude the study, participants from both group A and B were administered a short follow up questionnaire assessing their efforts over the course of the study and their motivational factors.

Statistical analysis:

Descriptive statistics (M±SD) were obtained for all dependent variables. Heart rate data were reported as beats per minute (bpm). A dependent t-test was used to compare the one-mile run time from the baseline trial, to the second trial. An independent t-test was used to determine differences between experimental conditions. Statistical significance was set at $p \leq 0.05$, and all analyses were carried out using the Statistical Package for the Social Sciences version 22.0 (Inc. Chicago, IL).

Results

A total of 16 individuals expressed interest in the study and completed all data collection of the study, thus 16 participants were used for all data analyses. Participants ranged in age from 19-24 years. Of the 16 participants, 8 were males and 8 were females. They were randomly divided into two groups: Group A and Group B, as previously described.

There was no significant difference in initial mile run time between the extrinsic group (7.7 ± 1.5 min) when compared to the intrinsic group (8.4 ± 1.7 min), p=0.454. There was no significant difference in final mile run time between the extrinsic group (7.5 ± 1.4 min) when compared to the intrinsic group (7.7 ± 1.5 min), p=0.758. There was no significant difference in percent difference between mile 1 and mile 2 times for the intrinsic group (-8.1 ± 9.23%) compared to the extrinsic group (-3.8 ± 5.84%), p=0.286. However, males were significantly faster (6.8 ± 1.5 min) compared to females (8.3 ± 1.0 min) during the second mile trial, p=0.036. See Figures 1 and 2 for more details.

When asked to rate motivating factors on a scale of 1-10, the intrinsic group, on average, rated money as the top motivator (9 ± 1) while rating a trophy as the least motivating (5 ± 3). For the extrinsic group, self-satisfaction was rated as the most motivating (8 ± 2), while also rating a trophy as the least motivating (4 ± 2) of all the factors. See Table 1 for more details.

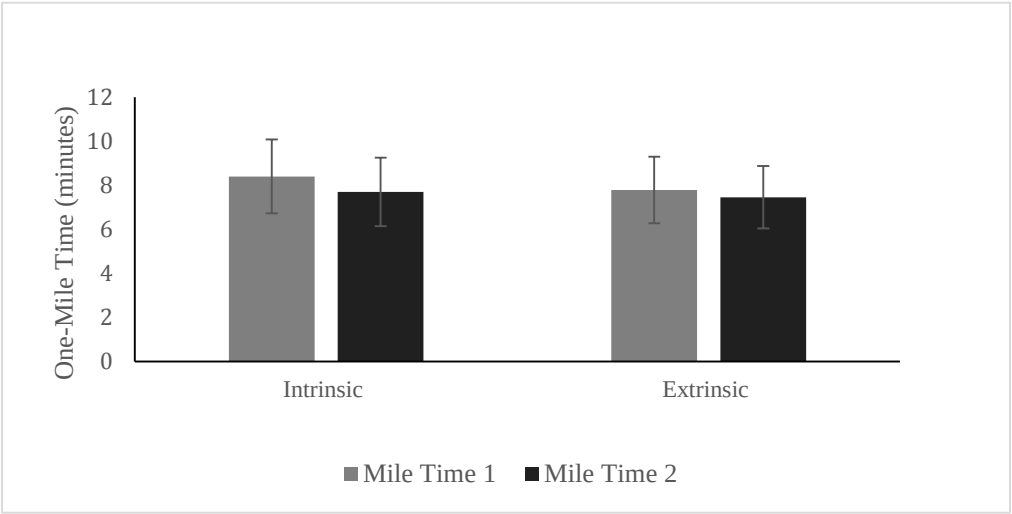

Figure 1. One-Mile Times for Intrinsic vs. Extrinsic Motivation (N=16)
Data are presented as M ± SD.

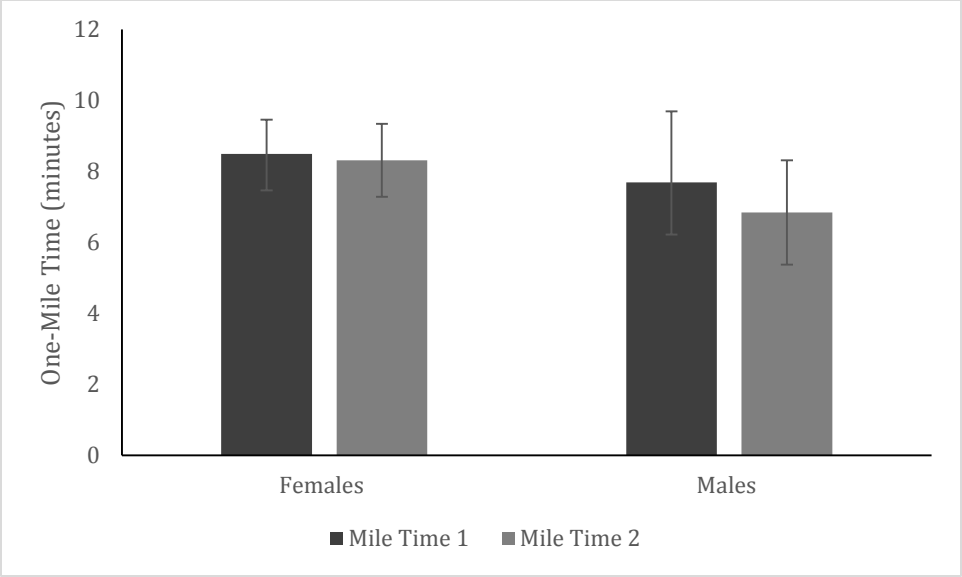

Figure 2. Mean Mile Times for Females vs. Males (N=16)
Data are presented as M ± SD.

Table 1. Motivating Factor Scores (N=16)

Category	Intrinsic	Extrinsic
Money	9 ± 1	7 ± 3
Trophy	5 ± 3	4 ± 2
Recognition	6 ± 2	6 ± 2
Self-Satisfaction	7 ± 2	8 ± 2
Health	8 ± 1	6 ± 3
Fitness	8 ± 1	7 ± 3

This table represents the average scores given to the motivating factors collected from the survey given at the end of the trial. The range of scores was 0-10 with 10 being the most motivating.

Discussion

The aim of this study was to examine whether college-aged males and females are more intrinsically or extrinsically motivated during a one-mile run. We further examined the effects of gender on motivation to understand the

nuances that effect an individual's motivation to exercise. Our results demonstrated that there was no significance between the intrinsic and extrinsic motivation groups. This was contrary to our expectations that many college-aged students would be more apt to run faster if extrinsically motivated (offered a prize for a faster time). A study by Richard (1997) states that the majority of men and women cite extrinsic factors (specifically, body image) as motivators to exercise (p. 349). But, the study goes on to assert that intrinsic motivation is often associated with continued exercise for longer periods of time. The overwhelming trend of sedentary college students seems to suggest that college students are not intrinsically motivated to exercise. This is a trend that health organizations should seek to change.

Although the hypothesis was not supported statistically, there are possible clinical uses for this information. This research adds to the current normative data on one-mile times for college-aged students. Further, there is much to be learned from the surveys for healthcare professionals working to motivate college-aged students to exercise. Trophies, recognition, self-satisfaction, and health ranked the lowest on the survey of motivating factors. This offers a valuable look at what not to do as an organization attempting to motivate students to exercise. It is worth noting that the participants (males and females in both groups) ranked money and fitness as the highest motivating factor from the survey. The fact that the intrinsic motivation group ranked money as the highest of motivators suggests that the participants randomly placed in the intrinsic group were likely not intrinsically motivated. This could be a cause for the lack of significance findings in the data. Further, ironically, the extrinsic group rated self-satisfaction higher than any other motivator. This would suggest that the majority of the participants were not extrinsically motivated; again, this could have contributed to the lack of significant findings in the data. An underlying theme is that many college-aged students seem to be motivated by money. This trend is seen overwhelmingly in every aspect of modern life. Large companies now offer cash-incentives for employees to finish tasks (Servan, Schreiber, Wolfers, Pennock, & Galebach, 2004). If this ideology was applied to health and fitness, the increase in health across all populations could see an increase. Organizations that seek to increase the amount of exercising students can capitalize on these findings by hosting long-term events that offer cash prizes.

It is important to note the limitations of this study. First and foremost, our study only had a convenience sample of 16 total participants. This small number limits representation across many populations. However, it does not mean that another group of researchers could not reproduce this study with a larger sample size. The second limitation is that all of the participants were college aged. This limits the usefulness of this research for older populations. Third, the experiment took place in a gym used by many other sports teams; the noise and amount of

people may have had an effect on the participant's run times across the study. Finally, there could have been a number of other limitations not able to be controlled by the researchers. Such as, the participants may not enjoy running as an exercise modality. Or perhaps, the participants exercise more efficiently in a group setting. Possibly the participants ate before the study, exercised before the study, or just did not heed the instructions of the researchers.

The main take away should be that it is important to further study what motivates individuals to exercise. More specifically, it is important to discern what factors lead to an extended adherence to exercise; ideally over a lifetime. If these important questions can be answered, there is potential for a major positive shift in the current health trends worldwide.

References

Abela, O. G., Ahsan, C. H., Alreefi, F., Salehi, N., Baig, I., Janoudi, A., & Abela, G. S. (2016). Plaque Rupture and Thrombosis: the Value of the Atherosclerotic Rabbit Model in Defining the Mechanism. *Current Atherosclerosis Reports, 18*(6), 29. Philadelphia, PA: Current Science

American College of Sports Medicine and American Heart Association. (1998) ACSM/AHA Joint Position Statement: Recommendations for cardiovascular screening, staffing, and emergency policies at health/fitness facilities. *Medicine and Science in Sports and Exercise*, (1018). (n.p.)

Arts, J., Fernandez, M. L., & Lofgren, I. E. (2014). Coronary Heart Disease Risk Factors in College Students. *Advances in Nutrition: An International Review Journal, 5*(2), 177-187.

Huang, J., Huang, S., Li, R., Wang, L., Chen, Y., & Tang, F. (2014). Effects of nutrition and exercise health behaviors on predicted risk of cardiovascular disease among workers with different body mass index levels. *International Journal of Environmental Research and Public Health*, *11*(5), 4664-4675.

Jianxing, Y., Yuchun, T., Yuhui, T., Sen, Y., Yaqin, Y., Bo, L., & Lina, J. (2016). Optimal cut-off of obesity indices to predict cardiovascular disease risk factors and metabolic syndrome among adults in Northeast China. *BMC Public Health*, 161-7. (n.p.)

Petrella, R., Lattanzio, C., Demeray, A., Varallo, V., & Blore, R. (n.d). Can adoption of regular excercise later in life prevent metabolic risk for cardiovascular disease? *Diabetes Care*, *28*(3), 694-701. (n.p.)

Pescatello, L. S., Arena, R., Riebe, D., & Thompson, P.D. (Eds.). (2014). ACSM's guidelines for exercise testing and prescription (9th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Rasiah, R., Thangiah, G., Yusoff, K., Manikam, R., Chandrasekaran, S. K., Mustafa, R., & Bakar, N. A. (2015). The impact of physical activity on cumulative cardiovascular disease risk factors among Malaysian adults. *BMC Public Health*, *15*, 1242.

Richard, M., Christina, M. F., Deborah, L. S., Rubio, N., & Kennon, M. S. (1997). Intrinsic motivation and exercise adherence. *International Journal of Sport Psychology, 28*(4), 335-354.

Ryan, R. M., Frederick, C. M., Lepes, D., Rubio, N., & Sheldon, K.M. (1997). Intrinsic motivation and exercise adherence. *International Journal of Sport Psychology*,(28), 335-354.

Saladin, K. S. (2007). *Anatomy & physiology: The unity of form and function*. New York, NY: McGraw-Hill.

Servan, Schreiber, E., Wolfers, J., Pennock, D. M., & Galebach, B. (2004). Prediction markets: Does money matter? *Electronic markets, 14*(3), 243-251.

Vallerand, R. J. (2007). Intrinsic and Extrinsic Motivation in Sport and Physical Activity. In G. Tenebaum & R. C. Eklund (Eds.) *Handbook of sport psychology*, (59-83). Hoboken, NJ: John Wiley & Sons.

Villegas-Rodríguez, M. E., Uribarri, J., Solorio-Meza, S. E., Fajardo-Araujo, M. E., Cai, W., Torres-Graciano, S., & ... Garay-Sevilla, M. E. (2016). The AGE-RAGE Axis and Its Relationship to Markers of Cardiovascular Disease in Newly Diagnosed Diabetic Patients. *Plos ONE*, *11*(7), 1-12. (n.p.)

Yu, E., Rimm, E., Lu, Q., Rexrode, K., Albert, C. M., Qi, S., & ... Manson, J. E. (2016). Diet, Lifestyle, Biomarkers, Genetic Factors, and Risk of Cardiovascular Disease in the Nurses' Health Studies. *American Journal Of Public Health*, *106*(9), 1616-1623. (n.p.)