

Summer 8-2018

# An Assessment of Motivation and Grit in Individuals Who Exercise at a Division II Facility

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ASSESSMENT OF MOTIVATION AND GRIT IN INDIVIDUALS WHO EXERCISE AT A  
DIVISION II FITNESS FACILITY

A Thesis

Submitted to the School of Graduate Studies and Research  
in Partial Fulfillment of the  
Requirements for the Degree  
Master of Science

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August 2018

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While it has been well-established that participating in regular exercise has many health benefits, including stress relief and decreasing risk of cancer and heart disease, according to the Centers for Disease Control and Prevention (CDC), only 20.6% of adults are actually exercising the recommended 150 minutes per week. Clearly, having all the information on the numerous benefits of regular exercise readily available to the general public does not serve as sufficient enough motivation to increase the number of people who exercise. Motivation is a critical component to sustained participation in exercise. Increasing research has been done to explore reasons why individuals are motivated to exercise. More recently, a noncognitive trait, grit, defined as the perseverance and passion for long-term goals, has also been explored for its role in exercise. A woman by the name of Angela Duckworth has focused her life's work on defining and expanding the concept of "grit." Grit is a psychological trait used to measure a person's passion for a particular long-term goal or end state. Grit entails working strenuously toward challenges, and maintain effort and interest over years despite failures, adversity and plateaus in progress (Duckworth, 2007). Literature reveals that an individuals grit level may vary depending on a number of different factors, like age, gender and education level.

## ACKNOWLEDGEMENTS

First, I would like to begin by expressing my sincere thanks and gratitude to Dr. Richard Hsiao for not only encouraging me to write a thesis, but supporting me throughout the process. I would also like to extend my gratitude to Dr. PaoYing Hsiao and Dr. Lou Pesci whose feedback and encouragement was instrumental to my success. Without their expertise and knowledge, I would not have been able to complete this research. I am extremely grateful for all three of them. In addition to my committee members, I would also like to thank all members of the James G. Mill Fitness Center who completed my survey. I appreciate their willingness to help out and participate in my study.

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## CHAPTER I

### INTRODUCTION

Over the last few decades, society has progressed and made drastic improvements especially in regards to the science and medical fields. These improvements have led to a dramatic increase in average life expectancy. Babies that were born in the early 1900s were deemed lucky to live to fifty, while babies born today can expect to live until their late 70's even early 80's in most countries (Global Health and Age, 2015). Although improvements in the medical field have increased the quantity of years in a person's life, they have not necessarily increased the quality of a person's life. However, participating in regular exercise or physical activity can increase the quality of an individual's life in a plethora of ways. Exercise can help alleviate stress, tension, and feelings of depression or anger. It can help reduce a person's chances of developing heart disease, and cancer and decrease their risk of having a stroke (Global Health and Age, 2015). Researchers at the Centers for Disease Control and Prevention (CDC) analyzed survey data collected from more than 450,000 U.S. adults across ages 18 and older and they found that only 20.6% met the total recommended amounts of exercise (CDC, 2013). Clearly having knowledge on the numerous benefits of exercise readily available to the public is not sufficient enough motivation to get people to participate in exercise regularly.

According to the International Health Racquet and Sports Club Association, over 55.3 million Americans owned a gym membership in 2015 (IHRSA, 2016). This means that at some point in time something motivated these 55.3 million people to go out and join a gym. Motivation plays a vital role in everyday life. It has the power to dictate and control our daily actions, feelings and behaviors. The source of motivation is unique and particular to the person. The goal of this research study is to investigate what motivational factors influence people to exercise,

specifically at the James G. Mill Fitness Center at Indiana University of Pennsylvania. Another aim of this research is to determine how the age, education level, and gender of these individuals impacts their motivation. The last aim of this research is to investigate the relationship between grit, a non-cognitive trait that allows someone to pursue long-term, challenging goals with passion (Duckworth, 2013), and exercise among the members of this fitness facility.

This research from this study may be pertinent for fitness center managers everywhere. The ability to meet the demands of customer satisfaction is essential for facility managers in the growing competitive fitness industry and this information can help managers go just that. (Theodorakis, Alexandris, Rodriguez & Sarmiento, 2004). The information garnered from this study can be used to increase exercise among individuals. Having a good grasp on how individuals are motivated to exercise will allow a facility manager to implement the proper equipment, classes and services to attract more clientele. Understanding these motives will also allow a fitness facility manager to foster an environment where customers are reaching their goals, which ultimately leads to higher customer satisfaction. A study conducted by Molanorouzi in 2015, involved separating 1,360 adults into two focus groups. Younger adults were categorized as participants ages 21-40 while older adults were between the ages of 41-60. This study found that; college-aged male students were motivated most by intrinsic factors like strength, competition, and challenge. Female college-aged students, on the other hand, were more motivated by extrinsic factors like weight management and improving overall appearance. His evaluation of the older generation showed that males were motivated by status and challenge while females were more concerned with health benefits and overall appearance (Molanorouzi, Khoo, & Morris, 2015). A study conducted by Campbell in 2001 focused more on the relationship between exercise motivation and age. Respondents were asked to evaluate each motivational factor both on its

importance as a personal goal and on how much they thought personal exercise could help them achieve these goals. This study found significant differences between age groups. Campbell concluded that one of the most significant differences is that 85% of younger adults ranked maintaining or improving their health as a strong source of motivation to exercise, while only 72% of older adults ranked this as top motivator for them. Significantly fewer adults felt that this factor was an important personal goal due to the fact that they believe that it is too late for them to prevent illness (Campbell, MacAuley, & McCrum, 2001). These studies provide evidentiary support that reveal the large impact age and gender have on motivation.

For purposes of this specific study, the primary researcher used two validated instruments. The first is the Behavioural Regulation in Exercise Questionnaire (BREQ-3) which is “the most commonly used a multidimensional measurement tool in psychological research, based on the continuum of behavioral regulation in exercise,” (Markland & Tobin, 2004). This survey was initially used to calculate each participants underlying motivation based on Deci & Ryan’s theory of self-determination. It groups behavioral regulation into one of these six categories; amotivation, external regulation, introjected regulation, identified regulation, integrated regulation and intrinsic regulation. Each of these subscales are given their own separate weighting or score and the researcher must calculate the degree of self determination, known as RAI (Ryan & Connell, 1989).

In addition to the BREQ-3, the researcher also implemented a validated, 8-item grit scale to measure the passion and perseverance of participants. This short grit scale was successful modified from the previous 12-item Grit Scale. It reveals the degree to which a person is considered gritty.

## **Research Questions**

1. What subscale of motivation from the BREQ-3 influences people to exercise the most?
2. Are there any significant differences between gender, age, and educational level in regards to an individual's overall relative autonomy index (RAI) score and total grit score?

## **Hypothesis**

1. Members of the fitness center will have high levels of intrinsic motivation.
2. Women will report higher levels of external regulation compared to men.
3. Younger individuals will report higher levels of external regulation.
4. Females will report having higher level of grit than males.

## **Assumptions**

1. It is assumed that participants understand the survey directions as they are intended.
2. It is assumed that participants will complete the survey fully and to the best of their ability.
3. It is assumed that participants are current members of the James G. Mill Fitness Center.
4. It is assumed that those who come to the fitness center are there to engage in physical activity.

## **Limitations**

1. This study will only examine members at the James G. Mill Fitness Center so the results cannot be generalized.
2. Another limitation of this study is that it is cross-sectional in nature. It is only looking at participants over a short time frame.
3. Certain results will be based off of self-reporting.

## **Definition of Terms**

*Intrinsic motivation:* when a person partakes in an activity or changes their normal behavior because they find it inherently pleasing not because they are looking for an external reward.

*Extrinsic motivation:* when a person participates in an activity because they are seeking approval or they want to reap a benefit or reward that comes from participating in an activity.

*Grit:* the tendency to pursue long-term challenging goals with perseverance and passion (Duckworth, 2013)

*Self-determination theory (SDT):* is a macro theory of human motivation and personality that concerns people's inherent growth tendencies and innate psychological needs. It is concerned with the motivation behind choices people make without external influence and interference.

*Grit Scale:* an eight-item self-report questionnaire with established construct and predictive validity (Duckworth & Quinn, 2009).

*James G Mill Fitness Center (JGM):* fitness center located on the campus of Indiana University of Pennsylvania

*BREQ-3:* questionnaire used to measure behavioral regulation (Markland & Tobin, 2006)

*Relative Autonomy Index:* a single score derived from the subscales that gives an index of the *degree* to which respondents feel self-determined (Markland & Tobin, 2006)

## **Significance of the Study**

Managers of a fitness facility need to have an understanding on motives that influence people to join a gym and regularly exercise. These motives may vary depending on the age and gender of the members. Having a good grasp on these motives can allow a facility manager to implement specific workout equipment, classes or services to attract more customers. They will be able to increase profits by alluring and retaining specific targets populations.

For example, if it is a known fact that the number one reason female customer's ages 20-30 exercise is to lose weight, a manager can implement a high intensity fat burning class to attract this specific group of people. The results of this study will also help a manager create higher customer satisfaction among clients. If managers know what motivates clients to exercise, they can use that information to help clients set exercise goals and create a plan for success. There have been numerous studies conducted on the correlation between motivation and exercise but what makes this study unique is the study sample the researcher is focusing on. The current body of literature involves numerous studies focusing on commercial gyms, Division I facilities or larger populations. This study however, is focused on members of a Division II academic fitness facility. Another unique aspect of this study is the measurement of grit. The number of studies on grit and exercise is very limited, especially in a university-based facility.



## CHAPTER II

### REVIEW OF LITERATURE

This review of literature will first discuss the concept of motivation and its influence on getting people to participate in regular exercise. According to the International Health Raquet and Sports Association, over 55.3 million Americans owned a gym membership in 2015 (IHRSA, 2016). This means that at some point in time something motivated these 55.3 million people to go out and join a gym. The principal investigator of this study is interested in finding out what motivational subscales (from the BREQ-3) influence members of the James G. Mill Fitness Center to exercise. Research from past studies reveals that demographic variables such as age gender and education level of an individual may impact their motivation levels. This review of literature will also delve into the concept of grit and how the age, gender and education level of an individual may impact a person's grit level.

#### **Exercise Motivation**

According to the CDC, regular physical activity is one of the most important things a person can do to increase health benefits. Exercise can help control weight, strengthen bones and reduce one's chance of developing serious diseases (CDC, 2011). The beneficial effects of exercises on the body are reflected by improvement in our overall health. Exercise can also help to release negative feelings of tension, can increase energy levels and promotes productivity. Physical activity also helps improve coordination, flexibility, agility and combat sedentary lifestyle and obesity (Valentina, 2016). Although there is a significant amount of research showing a direct correlation between exercise and increased health benefits, there are still many people that remain sedentary or do not participate in regular physical activity. Although knowledge on these benefits show just how vital exercise is, it is not sufficient enough to get people to participate in

a regular exercise regime. People lack the necessary motivation and drive needed to participate in physical activity.

Motivation is defined by Webster's dictionary as "the reason or reasons one has for behaving or acting in a particular way." Motivation plays a vital role in everyday life. It has the power to dictate and control our daily actions, feelings and behaviors. The source of motivation is unique and particular to the person and can help them establish develop and achieve goals throughout their life. Sidman, Fiala, and D'Abundo (2011) defined exercise motivation as a "psychological variable that is measured on a continuum of external reward or aversions and internal desires," (Sidman et al., 2011). An study by Al-Kubaisy asked participants to rank 21 motivating factors on a scale, according to what influenced them to exercise the least to the most. This study involved a sample size of 505 adults who engaged in regular exercise. They found that the majority of people ranked "working out makes them more relaxed" and "working out gives them more energy to go about their daily chores" as their top two motivating reasons as to why they exercise. The majority of participants also cited that their two least motivating factors that influence them to exercise is "recommended by the doctor" and "to have a positive effect on their sex life" (Al-Kubasiy, 2015).

According to a study conducted by Whaley and Schrider, how people view themselves, from past experiences to current reality, will strongly influence their choice to be physically active. This particular study involved nineteen older adults ages 60-70. These adults were interviewed about what motivated them to join a facility or to start an exercise regime. They found that a person's sense of self-perception plays a major role in whether she/he will start an exercise program. Whaley and Schrider assert that research consistently shows that positive feedback (from exercise professionals), reinforcement (that exercise is worthy and beneficial) and social

support (from significant others) will improve a person's self-perception to initiate an exercise program (Whaley & Schrider, 2005).

### **Exercise Adherence**

Exercise adherence is an individual's ability to consistently exercise over long periods of time. Research has found that a person's adherence will vary depending on the individual's initial reasoning or motivation to start exercising. A study conducted by Vallerland in 1997 found that although extrinsic goals may motivate people to initially start working out they will not have a lasting impact because participants are not finding any joy in what they are doing. If immediate results are not seen, or society's expectations have been met, people will be less inclined to continue exercising. In conclusion, he found that most people who join a gym and exercise on a consistent basis are more intrinsically motivated as opposed to extrinsically motivated (Vallerland, 1997).

Not only is it difficult to get people to want to participate in exercise initially, it is just as difficult to try to keep them interested and on track with their regular regime once they have started. Society today expects instant gratification. When individuals do not see instantaneous results or progress they tend to give up. Sometimes, even if progress has been made, individuals find their new routine so exhausting and time consuming that they give up. Research shows that "over 50% of people will drop out of their attempted exercise routine within 6 to 12 months of initiation," (Freene, Waddintong, Cheswoth, Dvey & Gross, 2011).

A study conducted by Albright in 2005 examined the influence of goal-setting on exercise adherence. Researchers used a goal-setting intervention to examine adherence and performance in 58 sedentary women. Results showed that the group that established specific goals (10,000 steps a day) reached and commonly even exceeded their goals. They had a significantly

greater step count and greater adherence compared to the group that established a vague goal of 30 minutes of walking most days of the week. This study proved that people are more motivated to exercise and stick with their exercise regime when they are trying to reach self-set, specific goals. Therefore, effective goal-setting has a positive effect on exercise adherence (Albright, 2005). Goal setting is an effective skill implemented by athletes and coaches all over. When an individual sets their own goals they are more motivated and determined to achieve them.

There is also research available that supports that exercise adherence can be influenced by the gender of an individual. A study conducted by Dhone in 2017, looked at ten females between the ages of 20-25. Participants were required to fill out an initial survey and then one every week throughout the duration of the study. The purpose of the initial survey was to discover the subject's most prominent motivational factors, determine if they had the ability to overcome obstacles, and provided them with the opportunity to state their goal or purpose of exercising. The weekly surveys required participants to report the number of days they exercised that week and how they would rate the intensity of those workouts. The researcher found that "non-adherent females were more likely to endorse body-related and health-related motives for exercising, (Dhone & Gaikwad, 2017)." In other words, females who were most motivated because of body-related issues, did not exercise as consistently and were not able to meet their unrealistic goals. Unfortunately, society today and especially young females are very influenced by the media and what they see on television. This could be an explanation for why females set such tough, unrealistic fitness goals. They want to look like the models that they see on television. When they don't reach these goals as quickly as they want to, they give up on exercising.

## **Self-Determination Theory and Exercise**

Over the past 15 years numerous research studies have applied Self-Determination Theory (SDT) in studies of health-related behavior change (Ryan & Deci, 2007). SDT is a motivation theory developed by Edward Deci and Richard Ryan that is concerned with figuring out what motivates people to behave in a particular way. This theory is centered on the fact that humans have three basic psychological needs. The first is a need for competence, which is basically the desire to master a skill and know the results of actions. The second need discusses the idea for relatedness. This is a person's desire to be accepted and need to feel a part of something. The third is autonomy, which is a person's need to control the control the course of life (Tran, 2014). Deci and Ryan (2007) found that there are two types of motivation: autonomous and controlled. Autonomy is referred to in terms of intrinsic motivations, such as engaging in physical activity that is enjoyable or somehow nourishing to the individual's needs, and controlled is referred to in terms of extrinsic motivations, such as reward or eluding some type of punishment (Deci & Ryan, 2007).

Sheldon and Elliot (1999) discussed the benefits of striving for personal goals that were rooted by autonomous (intrinsic or identified) motivational regulations, in comparison to goal striving for internally or externally controlled reasons (introjected or external regulations, respectively) (Sheldon & Elliot, 1999). Many professionals have utilized this theory, which is applied to exercise through the paradigms of autonomy, competence and relatedness (Mannetti, Kruglanski & Higgins, 2012). Studies have found that self-determination in motivation predicted higher levels of leisure-time exercise, and better quality of life (Gillson, Standage, & Skevington, 2006).

A study conducted by Minyong (2016) evaluated the effectiveness of a 13-month group exercise program applying SDT-based motivational strategies on exercise adherence, physical fitness, and quality of life, and to explore factors affecting exercise adherence in South Korean older adults (ages 50 and older). A few members of this group reported being relatively sedentary. The majority, however, reported that they exercise around 78 minutes a day. Participants had to take part in a 13-month exercise program 2 days a week, 60 minutes a day at Korea University. Participants fitness and quality of life were assessed three times for purpose of this study; baseline, seven months, and at the end of 13 months. After each session, a group interview was conducted and surveys that asked about motivation and adherence were distributed at 7 and 13 months. Results of this study indicated that SDT-based interventions had a positive effect on exercise adherence. More than 85.2% of participants showed up for each session and only one participant dropped out of the study. According to prior report, it is normal for half of the individuals who start an exercise program to drop out after 6 months (Minyong, 2016). In the short-term, identified regulation (e.g., the effect of exercise) was the main contributor to exercise adherence, whereas long-term adherence to exercise was influenced by intrinsic motivation (e.g., the enjoyment or satisfaction from exercise) (Minyong, 2016).

The literature on this topic is complex but necessary. Self-determination theory suggests that when individuals are more autonomous and intrinsically motivated they are more likely to establish goals and work towards them. Therefore, if this theory is correct, we can assume that the majority of long time exercisers are highly self-motivated.

### **BREQ-3**

The original Behavioral Regulation Exercise Questionnaire was developed in 1997 by researchers Mullan, Markland and Ingledew. It was used to “measure external, introjected, iden-

tified and intrinsic forms of regulation of exercise behavior based on Deci & Ryan's (1985, 1991) theory of self-determination," (Exercise Motivation Measurements)." Two other versions of the BREQ were developed overtime. In 2004, the BREQ was established by Markland and Tobin, and this included two more motivational three additional motivation subscales: amotivation, integration, and a new introjection item (Marland & Tobin 2004).

### **Intrinsic Motivation and Exercise**

Decades of research has shown that the quality of experience and performance can be very different when a person is more intrinsically motivated versus extrinsic motivated. Intrinsic motivation is when a person does something because they find it inherently interesting or enjoyable. When intrinsically motivated, the person experiences feelings of enjoyment, personal accomplishment, and excitement (Teixiera, Silva, Ryan & Markland, 2012). Intrinsic motivation can typically be measured through self-report or just seeing if participants are willing to do something even if there is no reward attached. Studies have suggested that the basis for maintaining intrinsic motivation is the person's feelings of competence, autonomy, and interest/enjoyment (Ryan & Deci, 2007). According to the SDT, "high intrinsic motivation comprises high competence, autonomy, relatedness, and low pressure and anxiety, and promotes vigorous participation in activities," (Ryan & Deci, 2000). Typically, in a fitness facility, intrinsic goals can be categorized as the health, fitness, and social relationships that one endures by exercising. Because intrinsic goals are self-motivated, they are associated with increased effort, performance and persistence. In general, the research suggests that intrinsic motivation plays a significant role in getting people to exercise.

Intrinsic motivation is a key factor in regards to exercise adherence as well. Many studies support the theory that "spontaneous enjoyment of an activity leads to increased persistence and

to reduced stress and positive psychological feelings,” (Ryan & Sheldon, 1997). Research reveal that individuals who are more intrinsically motivated are more likely to continue being physically active for long periods of time.

Although there is not a lot of research available supporting the fact that males are more intrinsically motivated than females, Gallagher and colleagues did find evidence suggesting this. It took place over a three year period and involved 710 participants in and around Berlin, Germany. They had participants report their life goals and their motivation source influencing them to achieve those goals. Next, participants had to record their physical activity over a 25-day period of time. Results revealed that intrinsic motivation seemed to impact the males that participated in this study more than the females (Gallagher, Yancy, Swartout, Denissen, Kühnel & Voils, 2012).

These studies provide evidence of the impact intrinsic motivation can have on an individual especially in regards to exercise adherence. It is clear that when individuals are intrinsically motivated they are more determined to do what it takes to achieve their goals.

### **Extrinsic Motivation and Exercise**

Extrinsic motivation is when a person does something because it leads to a separable outcome. A person might be extrinsically motivated to do something when they are seeking approval from others or they are interested in reaping the benefits or rewards that will come from participating. Recent studies have suggested that extrinsically motivated behaviors do not lead to consistent exercise behavior because people are only participating in it to please others (Ryan & Deci, 2007). Research on extrinsic motivation strongly suggests that people exercise in order to meet society’s standards in regards to looks and appearance. Extrinsic exercise goals usually re-



fer to improving physical appearance and losing weight and are created because people feel insecure or inadequate about themselves.

Gillson has suggested that that “some of the precursors to the extrinsic goals of weight management and appearance begin to emerge at or around puberty, largely due to the impact of the biological and associated social changes occurring at this time and the increasing importance of physical appearance to peer acceptance and social status, (Gillson, Standage, & Skevington, 2006).” He found that that young adults are more likely to be extrinsically motivated to exercise because of the undue pressure of society to have a healthy physique

Brawley and Vallerland support the majority of research out there that suggests that extrinsic motivation is not a substantial source of motivation. They suggested that individuals tend to initially participate in fitness programs for external reasons (to lose weight/improve appearance), but this kind of motivation typically leads to poor exercise adherence (Barwley & Vallerland, 1997). The researchers came to the conclusion that although extrinsic goals may motivate people to initially start working out they will not have a lasting impact because participants are not finding any joy in what they are doing. If immediate results are not seen, or society’s expectations have been met, people will be less inclined to continue exercising. The research suggests that the majority of consistent exercisers are more likely intrinsically motivated as opposed to extrinsically motivated.

### **Introjected and Identified Motivation**

The self-determination theory identifies introjected motivation as “motivation that focuses on the maintenance or enhancement of self-worth (Assor, Kaplan, & Roth, 2002).” In simpler terms this is when a person is pressured to look or behave a certain way because society deems it as “the norm” or “attractive”. When a person is described as being introjectedly motivated they

are letting society establish their values and goals because they want to be accepted and maintain high levels of self-worth. Researchers have also discovered something commonly known as introjected avoidance, meaning a person “tries to avoid feelings of low self-worth, shame, or guilt that may arise as a result of the failure to live up to the introjected standard,” (Assor, Vanteenkiste, & Kaplan, 2009). Because introjected motivation is typically associated with societal pressure and coercion, it is not as viewed as a strong, healthy motivator.

In order to be able to encourage more people to participate in regular exercise, it is important to have a solid understanding on why people choose to participate or not to participate in physical activity. Some people exercise to reap the numerous health benefits, while others exercise to keep up with society’s definition of “attractive,” and “beautiful.” While society can be seen as a strong motivator for some, it can also be viewed as a deterrence for others. Social physique anxiety is a very real concept, that “deters individuals from physical activity, because they are concerned with people negatively assessing their bodies.” This form of anxiety is very common among college-aged students. Researcher Chu, wanted to explore this relationship between social physique anxiety and obligation to exercise in college students. College students (n=377) were recruited and filled out 3 different questionnaires. In this specific study, females experienced higher levels of social physique anxiety, however, males and females had the same level of obligation to exercise (Chu, 2008).

Identified regulation, on the other hand, is when people behave a certain way because it aligns with their values and beliefs (Ryan & Deci, 2000). It is often associated with the term self-actualization and is viewed as being much more autonomous in terms of SDT. Identified motivation is often looked at as being a stronger motivator that really enables people to pursue and reach their goals. A study conducted by Assor, which involved 1,222 adolescents, tested the the-

ory that identified regulation was a more positive motivator when compared to introjected regulation. More specifically, the results revealed that identified motivation, unlike introjected regulation, had positive associations with “mastery goals, well-being, engagement indicators, and positive performance, (Assor, Vanteenkiste & Kaplan, 2009).”

### **Amotivation**

Vallerland defines amotivation as a “lack of intentionality and thus the relative absence of motivation,” (Vallerand, 1999). People that are described as being amotivated do not associate any benefits with exercising, or they feel as if there is no correlation between their behavior and outcomes. This ultimately leads to a struggle to consistently participate or participate at all in exercise (Vlachopoulos & Gigoudi, 2008). Amotivation has been linked to athletes dropping out of a sport and low involvement or absence in physical education classes. The BREQ did not always include amotivation to assess exercise due to their high level of skewness, but Markland and Toblin believed it was necessary and an excellent fit to the model. Amotivation may occur for several reasons. Pelletier coined the term “capacity beliefs” in 1999, which meant that individuals believed they lacked “the physical and psychological resources required to cope with the demands of regular exercise participation,” (Pelletier, Dion, Tuson & Green-Demers, 1999). Research suggests that another reason people could be defined as amotivated is because they do not believe the benefits outweigh the cost of exercising. In 2003 researchers, Cropley and colleagues found that nonexercisers “provided more “con” reasons (costs) related to exercise than did maintainers (regular exercisers), who provided more “pros” (benefits), and other studies have supported the relationship between outcome expectations and older adults’ physical activity behavior,” (Cropley, Ayers & Nokes, 2003).

## **Gender and Exercise Motivation**

Typically, males and females are not driven by the same things and they tend to react to situations and prioritize things differently. There have been numerous studies conducted on gender differences and motivation in the workplace, in school, and in life. These facts lead us to assume that males and females in this study will report different levels of motivation. When conducting research on gender and exercise motivation, several conflicting results appeared. A study conducted by Al-Kubaisy (2015) revealed that, although males and females did rank motivational factors differently, the difference was very slight or insignificant. They found that the most significant difference was that males ranked; “having more energy for the day” and “to have a positive effect on their sex life”, higher than females did. While females ranked “improving their personal appearance” and “having more energy for daily chores” higher than males did. (Kubaisy, Mohamed, Abdullah, & Mokhtar, 2015).

A study conducted by Molanorouzi found that males were more motivated by intrinsic factors (strength, competition, and challenge), whereas females were motivated by extrinsic factors (weight management and appearance). Further results revealed that adult males are more motivated to work out because of “status, mastery and challenge, while females were more concerned with health benefits and overall appearance” (Molanorouzi, Khoo, & Morris, 2015).

Females have been shown to be more dissatisfied with their bodies than men. It has been estimated that “45% of females are making an effort to lose weight at any given time, and this value increases to 60% for those who are overweight. As females become more exposed to images of this thin ideal, they often begin to internalize this standard so that it becomes the reference point against which they judge themselves,” (Pearson & Hall, 2013).

In 2010, Duncan conducted a study grounded in self-determination theory. This study involved a total of 1,079 participants who were required to fill out a survey revealing how often they exercised, how long their workouts lasted and how intense their exercise sessions were. Participants were also required to fill out the original Behavioral Regulation Exercise Questionnaire (BREQ). The results of Duncan's study revealed males and females differed significantly in terms of the typical duration of exercise adherence. Males reported exercising for much longer durations of exercise than females. However, there was no significant difference reported between exercise intensity and number of gym sessions per week (Duncan, Wilson, & Jenny, 2010).

Research has found that an individual's gender influences their motivation to exercise or participate in physical activities. For example, females are more prone to participate in more 'feminine activities' while males are encouraged to take part in more 'manly' sports. In 2008, the Bureau of Labor Statistics, reported that males cite participating in football, golf, basketball, and soccer as their most common sources of physical activity, while females cite their's as participating in yoga, aerobics, walking and dance. Males are encouraged to stay competitive by increasing muscle mass, while females are view exercise as a means to enhancing their looks by losing weight. Although both are concerned with improving their overall physical appearance, "typically males are motivated to increase their body size, while females are motivated to maintain or lose weight as a means of enhancing their attractiveness or sexual appeal," (Kilpatrick, 2005).

Martinez and colleagues investigated how exactly a person's gender, age and BMI, could predict exercise motivation. In order to do this, she looked at a study sample of 112 participants (52 males, 60 females) ranging from 17-80 years old. The researcher used the Exercise Motiva-

tion Inventory in order to decipher and categorize the numerous reasons why these people choose to exercise. She found that, males were more motivated to exercise for competition, while females had higher motivation to exercise for appearance and weight management. Age was positively related to exercise motivation for weight management and health reasons. With increased age, people reported greater motivation to exercise for revitalization, weight management, nimbleness, and to avoid illness. Specifically, being female, older, and having higher BMI contributed to increased motivation to exercise for health reasons (Martinez Gillespie & Bale, 2014).

Kilpatrick and colleagues were also interested in investigating how gender impacts motivation. His study involved 233 students ages 18-47 enrolled in health and kinesiology classes at a Southeastern university. Participants were required to fill out a 10 minute questionnaire about their exercise routine and demographics. Results showed that females were ultimately more concerned with exercising to improve their appearance and lose when compared to the males. They also cited stress management as a more relevant source of motivation than the males did. Males cited higher levels of motivation in regards to, “challenge, competition, social recognition, and strength and endurance (Kilpatrick, 2005).

### **Age and Exercise Motivation**

Another key factor that has the potential to impact exercise motivation is age. Although exercise is vital to engage in at any age, the reasons people exercise tends to change throughout one’s life. As individuals grow older, they experience changes in energy levels, metabolism, and overall functions of the body. These changes force people to prioritize different things. A study conducted in 2011, examined the impact age has when people cite motivational factors that influence them to exercise (Egli, Bland, Melton & Czech, 2011). The researchers conducted a cross-sectional study that entailed 2,199 participants from 156 different sections of physical ac-

tivity college classes to fill out the Exercise Motivation Inventory. Participants were divided into two categories: those < 20 years of age (n =33) and those ≥ 20 years of age (n = 45). They found significant differences when analyzing the 14 subscales and age of participants. When the two age categories results were compared, significant differences were found for affiliation (p=.036), health pressure (p=.002), and ill-health avoidance (p=.020). In other words, participants younger than 20 years old were more likely to be motivated by health pressure and ill-health avoidance, whereas those 20 years old and greater were more likely to be motivated by affiliation (Egli, Bland, Melton & Czech, 2011).

Another study conducted by Molanorouzi, found that young and middle aged adults reported scored very differently in motivational subscale categories. The central measure tendency indicated that young adults seemed to find more enjoyment and affiliation when participating in physical activity compared to middle aged adults. The middle aged adults were more concerned and motivated by the expectations of society and the health benefits associated with regular exercise (Molanorouzi, Khoo, & Morris, 2015).

In a study conducted by Al-Kubaisy, results revealed that younger adults were more likely to engage in physical activity than older adults. The explanations for such results could be that, older adults may have; perception of great effort needed for exercise, perception of poor health, overweight or obese, or being disable due to physical, emotional, and psychological problems. In addition, lack of social support, lack of transportation to facilities or inaccessibility of facilities, fear of injury and the difficulties of managing physical injury faced by elderly people may act as barriers that keep them far from being physically exercise (Al-Kubaisy, 2015). In conclusion, “physical activity seems to decline with age during adolescence and by the time US

citizens reach adulthood, more than two-thirds are sedentary or inactive below the recommended level for health benefits,” (CDC, 2011).

Research has also revealed that a person’s willingness to stick to or adhere to their exercise regime varies depending on the age of the person. Although the research supporting this is scarce, there are numerous reasons supporting why this statement could be true. A person may start exercising more consistently after the reach retirement age (60-65) because they have more time to do so. They also may believe that engaging in regular exercise could potentially increase their life expectancy. Also researchers have found that an important indicator of future behavior is past behavior. Therefore, “early exercise experiences and recent involvement in physical activity have often been shown to predict adherence to a current exercise program,” (Rhodes, Martin, Taunton, Donnelley & Elliot, 1999).

Unfortunately, decreasing overall health is often associated with growing older. As a person’s health starts to deteriorate, they find it more and more difficult to continue a rigorous exercise regime. A study conducted by Emery in 1981 involved analyzing a sample size of 101 males and females who fell between the ages of 60-85 years. These participants were required to participate in a 10-12 week exercise program. Researchers recorded their observations. Emery concluded that “certain physical health measures such as greater cardiorespiratory endurance and faster psychomotor speed were the most significant predictors of adherence using regression analysis,” (Emery, Hauck, & Blumenthal, 1981). Another study conducted by Williams and Lord, limited their study to just females. Their sample size consisted of 102 females between the ages of 60-65. These females were observed over the course of a 12-month exercise program. Results revealed that ‘body limitations, reduced strength and slow reaction time resulted in these females coming in less and less.’ Research indicated that elderly people will cite things such as



“illness,” “feeling weak,” and “overall poor physical health” as reasons why they do not exercise as often as they would like.

A person's priorities and perspective begin to change with age. Therefore it is safe to assume that college students and elderly adults are most likely motivated by different factors in regards to exercising. The literature suggests that age does play a critical role in determining motivation factors for exercising. One of the most obvious differences fell under the category of personal goal setting. The results from a study conducted by Campbell revealed that younger adults found joy and happiness when exercising while older adults did not cite this at all. In fact, upon further research they discovered that older adults did not typically find a correlation between exercise and fun at all. This study also revealed that 85% of younger adults ranked maintaining or improving their health as one of their most motivational factors compared to 72% of older adults. The most similar results between the age groups fell under personal goals. Both older and younger adults ranked “feeling in good shape” as their most important personal goal (Campbell, MacAuley, & McCrum, 2001).

### **Grit**

Grit is a psychological trait used to measure a person's passion for a particular long-term goal or end state. It entails “working strenuously toward challenges, and maintaining effort and interest over years despite failures, adversity and plateaus in progress,” (Duckworth, 2007). The impact of grit has been studied by numerous different researchers. It has been cited as a main reason that people are able to overcome difficulties and consistently pursue their goals even in the face of adversity. For example, Robertson was interested to see if grit could predict whether teachers in low income areas would stick with their job. Grit was measured or determined based on their answers to a 8-item inventory assessment. Results revealed that “grittier teachers outper-

formed their less gritty colleagues and were less likely to leave their classrooms midyear,” (Robertson & Duckworth, 2014).

A study by Duckworth in 2009, examined the relationship between a person’s grit level and the number of hours they put into practicing or preparing for a competition. Although this study does not involve exercise, it involves the concept of adherence in regards to the number of hours a person spends practicing. In order to do this, Duckworth examined participants in the National Spelling Bee and measured their level of “grit” versus their level of “openness to experience.” Duckworth wanted to discover if grit could determine a competitor’s ability to advance to the next round of the completion. The results of this study revealed that participants that performed well in the National Spelling Bee usually ranked higher in grit than those who did not perform as well. Specifically, the grittier spellers performed better. This could be attributed to the fact that grittier spellers spent more hours practicing than their less gritty competitors. Grit was the most significant predictor of success. In fact the “mean for same-aged finalists were 41% more likely to advance to further rounds.” (Duckworth, 2009).

### **Grit and Exercise**

Duckworth investigated the relationship between a person’s level of grit and their ability to complete a strenuous physical task, using a sample of 1,218 freshman cadets in the United States Military Academy, at West Point. She and her fellow researchers investigated whether “grit” or “self-control” could better predict which cadets would complete the demanding summer training program. A questionnaire was distributed to the cadets upon arrival to West Point. This questionnaire, known as the Brief Self-Control Scale, consisted of 13 questions and assessed their levels of grit and self-control. Out of the total sample, 94.2% of cadets completed the summer training (n=1,152), which means the remaining 5.8% dropped out (n=71). Results revealed that a

person's grit level predicted completion of the summer training program better than any other predictor. "Cadets who reported higher than average grit levels were 60% more likely to complete summer training," (Duckworth, 2007).

With exercise adherence being a major issue in today's society, many researchers have looked into why certain people are able to consistently stick with their difficult exercise programs while others do not. They wondered what traits an adherent exerciser possess. Duckworth argues that people with higher levels of "grit" are more likely to stick to engage in regular exercise. More researchers have been interested in studying the relationship between grit and exercise. Reed conducted a study that involved 1,171 participants. These participants were required to fill out an online survey that revealed demographic information, exercise information, and trait differences. Reed found that grit was the best predictor of exercise consistency. The results revealed that the most consistent exercisers reported higher grit scores when compared to less consistent exercisers.

### **Grit and Gender**

The research available on the impact of gender on grit has produced some mixed results. For example, in 2009 Duckworth conducted six different studies involving grit and in all six she found that grit scores did not differ between genders. Other researchers results found significant differences in gender and grit scores while others did not. In 2012, Rojas and colleagues conducted a study involving 2,426 (49% female, 50.1% male) students in grades 4 to 8. Grit was assessed using an adaptation of the original grit scale and compared to scores in reading and math. Rojas found that the "girls reported higher grit scores than the males in this study at the  $p < .001$  level," (Rojas, Reser, Usher, & Toland, 2012). Jager and colleagues found similar results, when conducting their five year study of engineering students. These researchers were interested in

investigating the grit levels in these students as they continue through the program to see if they increase. Jager found significant differences between genders, noting that females reported higher levels of grit. However, in 2011 Batres conducted a study examining the relationship between grit, happiness, students GPA's and overall attendance. Her results indicated no difference in regards to gender and grit levels ( Batres, 2011).

### **Grit, Age and Education Level**

Duckworth also wanted to determine the relationship between grit and a person's education level. In order to do this she conducted a study involving 1,505 adults ages 25 and older. Participants were required to report their age, gender, and education level. Results revealed that education does seem to play a role in relation to grit. More educated adults scored higher in grit than less educated adults. Post hoc comparisons revealed that when age is controlled for, post college graduates were higher in grit than most other groups. They also found that when education level is controlled for, grit increased monotonically with age; however, 25- to 34-year-olds did not differ significantly from 35- to 44-year-olds, and 45- to 54-year-olds did not differ significantly from 55- to 64-year-olds (Duckworth, 2011).

### **Grit and BMI**

Researchers have also studied the relationship between grit and weight management. Most have found that grit is often times negatively associated with body weight and body mass index. A study conducted in 2015 required 79 women to fill out the short grit scale and eating inventory before entering into a 1-year weight gain prevention trial. The researchers found that the women who scored higher in terms of grit had a better control over their weight, therefore had lower BMIs. The women with higher grit scores "had lower disinhibition and hunger scores and higher

cognitive eating restraint scores,” (Metzgar, 2015). However, since this is a relatively new topic, further exploration should be conducted.

In summary, this literature review provides rationale for the hypotheses selected for this particular research study.

CHAPTER III  
METHODOLOGY

**Participants**

The subjects for this research study included all willing, current members of the James G. Mill Fitness Center (JGM). The JGM is a health and wellness facility open to Indiana University of Pennsylvania's retired and current faculty/staff members, students and to the general community. This fitness center is located on the campus of Indiana University of Pennsylvania, and consists of treadmills, ellipticals, machines, free weights, and an aerobics room. According to the most recent membership roster, which is updated on a yearly basis, the total number of current fitness center members is around 200 people. Of these 200 members, it is estimated that around 90 people come in regularly throughout the week. This subject pool was both convenient and non-random because the researcher was specifically seeking out the active members of the fitness center. Subjects were to be 18 years or older in order to participate. Exclusion criteria included non-willingness to participate or incomplete surveys.

**Recruitment Strategies**

To recruit participants, all employees of the JGM distributed surveys at the front desk of the fitness center. Employees asked them to complete the survey prior to their workout. The survey took no longer than 15 minutes to complete. If they choose to participate they had to complete the survey and place it in the assigned drop box. There were two drop boxes available to participants. One was located outside the primary researcher's office and the other was located in the fitness center. The surveys were kept in a secure location that only the research team had access to. By completing and returning the survey members provided informed consent to be re-

search subjects in the study. Recruitment of participants and garnering data took place over a five week period from January 30, 2017 to March 6, 2017.

### **Procedures**

This research study design was descriptive with cross-sectional and quantitative elements. Employees working at the front desk asked members to fill out the survey prior to their workout. The survey took approximately 15 minutes to fill out. Upon completion, participants placed surveys in one of the two drop boxes mentioned above. In order to prevent double completion of surveys, members were required to fill out their names. Although this survey was not anonymous only aggregate data was reported. These surveys were collected from January 30<sup>th</sup> 2017 to March 6<sup>th</sup> 2017. Completion and return of the survey indicated consent to participate in the research study.

### **Instrumentation**

All members were asked to complete a survey, when they entered the facility. This survey distributed contained three parts. The first was a demographic survey where participants were asked to report their name, age, gender, height, weight, education level, membership type (i.e., faculty/staff, student, general community) and the number of times they exercise last week. Body mass index (BMI) was calculated based on self-reported height and weight ( $BMI = [\text{weight (lb)} / \text{height (in)} / \text{height (in)}] \times 703$ ).

For purposes of this particular study, two separate validated surveys were used: the Behavioral Regulations Questionnaire (BREQ-3) and the Short Grit Scale.

#### ***BREQ-3***

The BREQ-3 was used to measure participants' underlying motivation. Participants' answered 24 questions using a Likert Scale (0=not at all true for me, 4=very true for me). The in-

ternal consistency of each scale on the BREQ-3 were as follows: Amotivation, ( $\alpha = .847$ ), External Regulation, ( $\alpha=.749$ ), Introjected Regulation, ( $\alpha=.793$ ), Identified Regulation, ( $\alpha= .780$ ), Integrated Regulation, unreported, and Intrinsic Regulation, ( $\alpha=.894$ ) (D'Abundo et al., 2014). Each of these subscales are given their own separate weighting or score, and then the researcher must calculate the unidimensional index of the degree of self-determination, known as RAI (Ryan & Connell, 1989). The RAI is calculated by weighting each subscale and summing the weighted scores: (Amotivation multiplied by -3) + (External Regulation multiplied by -2) + (Introjected Regulation multiplied by -1) + (Identified Regulation multiplied by +1) + (Integrated Regulation by +2 (Intrinsic Regulation multiplied by 3). Higher positive scores for the RAI indicate more autonomous motivation whereas lower negative scores indicate less autonomous motivation, (Exercise Motivation Measurements).

### ***Short Grit Scale***

In addition to the BREQ-3, the 8-item short grit scale was used to measure the passion and perseverance of participants to complete longterm goals. This short grit scale consists of an 8-item inventory and was successful modified from the previous 12-item Grit Scale. Participants' were required to circle the number that most applied to them with the given scenario. The instrument was scored by adding up all of the points and divided by 8 for each participant (Duckworth & Quinn, 2009). The maximum score you can receive is a 5 (extremely gritty), and the lowest score on would be a 1 (not at all gritty). This modified version has been shown to both valid and reliable: internal consistency ( $\alpha=.73-.79$ ) (Duckworth & Quinn, 2009).

### **Statistical Analysis**

The BREQ-3 and Short Grit Scale were used to survey the participants to investigate the relationship between motivation and grit levels in regards to members of the fitness center.



Descriptive statistics were used to report demographic factors such as gender, age, education level and BMI. In order to investigate the relationship between motivation levels and members of the JGM, responses to the BREQ-3 were examined. The data was grouped according to gender, age, and education level of participants. Participants' were grouped into two age groups: participants less than thirty years of age and participants thirty years and over. R scores from the BREQ-3 were examined categorically and continuously. Pearson Correlation Coefficients were used to determine the relationship between motivational subscales from the BREQ-3 and self-reported number of days exercised in the last week. Independent samples *t*-tests were used to assess the differences between gender/age of participants and their overall RAI scores. An ANOVA was run to compare education level and RAI scores. In order to explore the impact grit has on influencing individuals to exercise, responses from the Short Grit Scale were examined continuously. Independent samples *t*-tests were run to assess the differences between gender/age of participants and their total grit score. An ANOVA was run to compare education level and total grit score.

## CHAPTER IV

### RESULTS

#### Surveys Analyzed

The study questionnaire, comprised of the multidimensional scoring scale known as the BREQ-3 and the Short Grit Scale questionnaire, were distributed to members of the JGM. Everyone that entered the facility was asked to complete the survey. A total of 80 surveys were returned. Among these 80 distributed surveys, 2.5% (n=2) were not usable because they had missing values. Statistics were run based on the 78 surveys that were completely filled out. The total percentage of useable surveys for this study was 97.5%.

#### Demographics

The age of participants who took place in this study ranged from 19-80 years. For purposes of this study participants were categorized into two age groups: participants less than thirty vs participants thirty and older. Of the 78 participants in this study, 53.8% (n=42) were male while 46.2% (n=36) were female. The majority of participants in this study reported exercising 4 times a week. Other characteristics are reported in Table 1.

Table 1  
*Demographic Characteristics of Participants*

		Percentage
Gender	Male	53.8%
	Female	46.2%
Education level	High school	10.3%
	College	51.3%
	Higher than college	38.4%
Membership package	Student	39.7%
	Faculty/Staff	33.3%
	General Community	27.0%

### BREQ-3 Results

The mean RAI score was  $M=59.03$  (Table 2). Based on the RAI calculations, the majority of participants reported being intrinsically motivated ( $M=37.96$ ), the next highest reported motivation was Integrated Regulation ( $M=25.18$ ), followed by Identified Regulation ( $M=14.0$ ). On average, participants reported Amotivation ( $M=-1.7692$ ), External Regulation ( $M=-6.0256$ ) and Introjected Regulation ( $M=-10.32$ ) as the motivation source they pull from the least.

Table 2  
*Results of BREQ-3*

BREQ-3 Subscale	Mean	Std. Deviation
Amotivation	-1.77	5.35
External Regulation	-6.03	6.78
Introjected Regulation	-10.32	4.01
Identified Regulation	14.00	2.27
Integrated Regulation	25.18	6.63
Intrinsic Regulation	37.96	8.63
RAI	59.03	20.46

Pearson Correlation Coefficients were calculated to determine the relationships between the number of days participants exercised in the last week and the BREQ-3 motivation subscales. Results revealed weak correlations for Amotivation, Introjected Regulation, and Intrinsic Regulation that did not significantly correlate with number of days exercised in the last week. However, the correlation tests revealed that External Regulation ( $r = .307$ ) Identified Regulation ( $r = .343$ ), and Integrated Regulation ( $r = 3.08$ ) were significantly and low to moderately correlated with Exercise at the  $p = .01$  level. A correlation was also calculated to show the relationship between RAI score and participants' self reported number of days exercised in the last week. A medium positive correlation was found ( $r = .339$ ,  $p < .01$ ). From this information it is inferred that

participants who reported more days exercised in the last week tend to have higher RAI scores (Table 3).

Table 3

*Motivation Subscales and Number of Days Exercised*

		Exercise	External Regulation	Introjected Regulation	Integrated Regulation	RAI
External Regulation	Pearson Correlation	.307*				
	Significance	.006				
	N	78				
Identified Regulation	Pearson Correlation	.308**	.244*	.735**		
	Significance	.006	.031	.000		
	N	78	78	78		
Integrated Regulation	Pearson Correlation	.308**	.244*	.735**		
	Significance	.006	.031	.000		
	N	78	78	78	78	
RAI	Pearson Correlation	.339**	.708**	.687**	.698**	
	Significance	.002	.000	.000	.000	
	N	78	78	78	78	78

\* Correlation is significant at the 0.05 level (2-tailed)

\*\* Correlation is significant at the 0.01 level (2-tailed)

**Gender and RAI**

To examine differences between the gender of participants and their overall RAI scores, an independent samples *t*-test was calculated comparing the participant gender and overall RAI scores. No significant difference was found ( $t(76) = -0.133, p > .05$ ). The mean of the males ( $M = 58.7381$ ) was not significantly different from the mean of females ( $M = 59.3611$ ). The bar graph serves as a visual representation that RAI score was not even one full point different between males and females (See Figure 1). Independent samples *t*-tests were calculated comparing

gender and scores for each motivational subscale. The researcher was particularly interested in comparing genders and external regulation. No significant differences were found ( $t(76) = .236$ ,  $p > .05$ ). The mean of females ( $M = -6.2222$ ,  $sd = 7.661$ ) was not statistically different from the mean of males ( $M = -5.8571$ ,  $sd = 6.0145$ ).

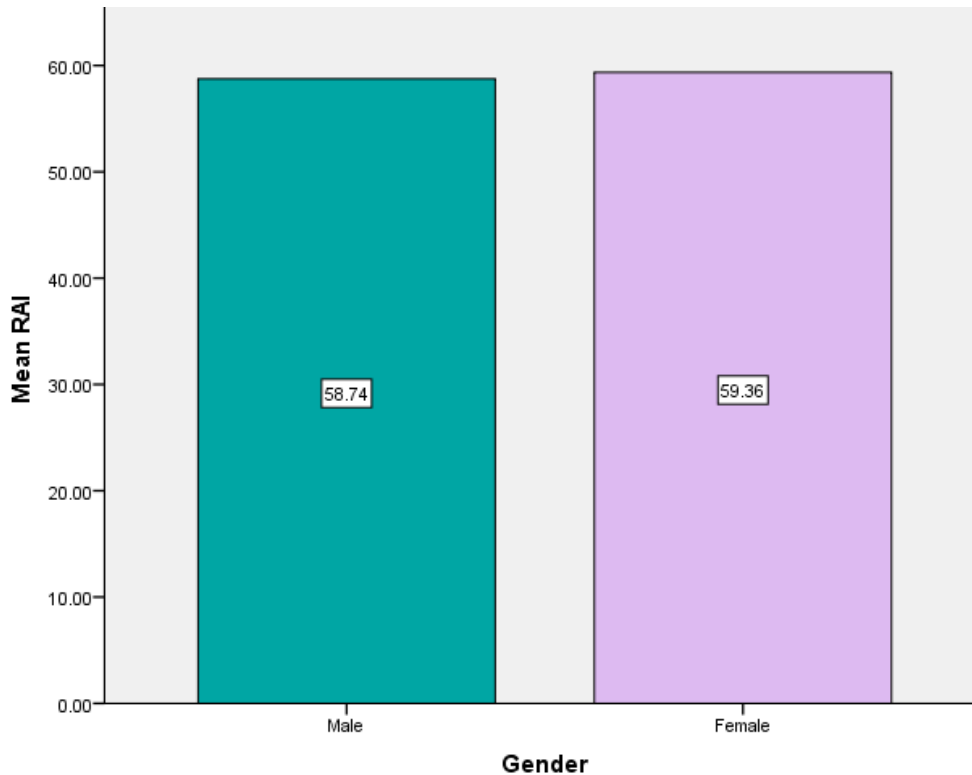


Figure 1. Gender and RAI

### Age and RAI

Independent samples  $t$ -tests were used to examine the relationship between the age of participants and their overall RAI Score. No significant difference was found ( $t(5) = .913$ ,  $p > .05$ ). The mean RAI score of participants less than 30 years of age ( $M = 61.3714$ ) was not significantly different from the mean score of participants 30 years of age and older ( $M = 57.1163$ ). Several independent samples  $t$ -tests were run to examine the relationship between age groups and each BREQ-3 motivation subscale. No significant difference was found ( $t(76) = .902$ ,  $p <$

.05). The mean Introjected Regulation score of participants less than 30 years of age ( $M = -5.2571$ ) was not significantly different from the mean score of participants 30 years and older ( $M = -6.6512$ ).

### **Education Level and RAI**

A one-way ANOVA was computed comparing the education level of participants and their overall RAI score. No significant difference was found ( $F(2,75) = .998, p > .05$ ). Participants who received only a high school education ( $M = 67.75, sd = 16.21$ ) had the highest RAI score when compared to participants who received a college degree ( $M = 59.33, sd = 17.14$ ) and participants who furthered their education past college ( $M = 56.30, sd = 20.45$ ) when comparing their RAI scores.

### **Investigation of Grit**

#### **Grit and Education Level**

The education level of participants and their reported total grit levels were compared using a one-way ANOVA. No significant difference was found ( $F(2,75) = .063, p > .05$ ). Participants who furthered their education past college had the highest mean score of 3.966 ( $sd = .519$ ). Participants who received a college degree had a mean score of 3.962 ( $sd = .599$ ). Participants who received only a high school education had the lowest mean score of 3.89 ( $sd = .488$ ).

#### **Grit and Age**

An independent samples *t*-test was calculated to compare the mean score of participants ages and their total grit score. No significant difference was found ( $t(76) = -.199, p > .05$ ). The mean total grit score of participants less than 30 years of age ( $M = 3.9429$ ) was not significantly different from the mean of participants 30 years and older ( $M = 3.9680$ ).

### Grit and Gender

An independent samples *t*-test was calculated to compare the gender of participants and their total grit score. No significant difference was found ( $t(76) = 0.027, p > .05$ ). The mean of the male participants ( $M = 3.9583$ ) was not significantly different from the mean of the female participants ( $M = 3.549$ ).

### Grit and BMI

An exploratory analysis was conducted in order to determine the relationship between participants BMI scores and their total grit score. A Pearson Correlation Coefficient test revealed significant correlation was found ( $r = -.228, p < .001$ ) indicating a small, negative relationship between the two. This suggests an inverse relationship, meaning participants with higher BMIs tend to have lower total grit scores. (See Figure 2).

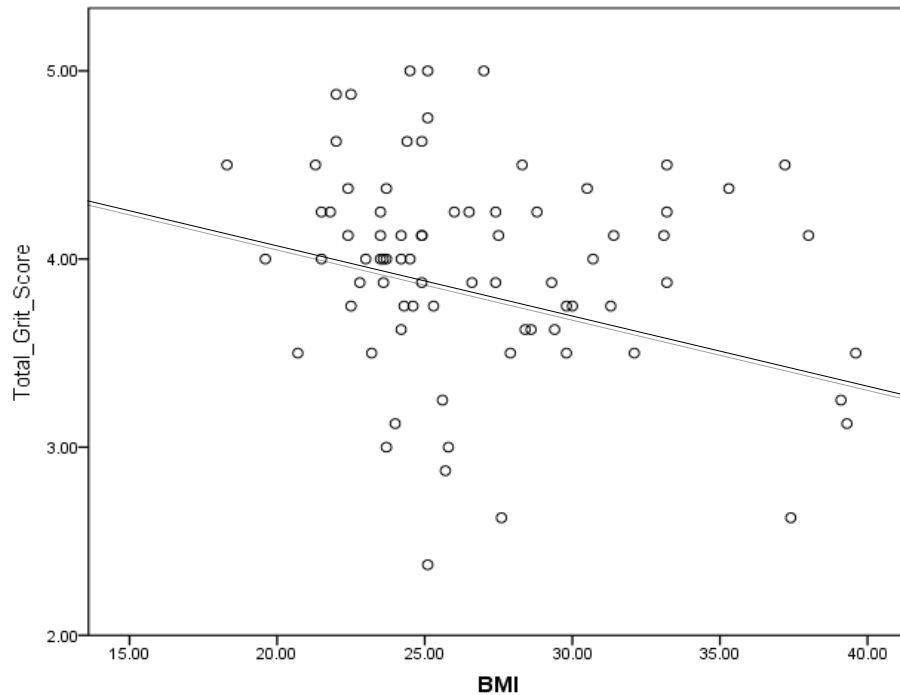


Figure 2. BMI vs Grit Score

## Grit and RAI

A second exploratory analysis involved conducting another Pearson Correlation Coefficient to examine the relationship between total grit score and RAI. A significant correlation was found ( $r = .441$ ,  $p < .01$ ), indicating a medium positive between these two variables. Participants with higher RAI scores tend to have higher total grit scores (Table 4).

Table 4  
*RAI and Total Grit Score*

		RAI Grit	Total Score
RAI	Pearson Correlation	1	.441*
	Significance		.000
	N	78	78
Total Grit Score	Pearson Correlation	.441*	1
	Significance		
	N		

\* Correlation is significant at the 0.01 level (2-tailed)



## CHAPTER V

### DISCUSSION

#### **Summary of the Study**

While it has been well-established that participating in regular exercise has many health benefits, including stress relief and decreasing risk of cancer and heart disease, according to the CDC, only 20.6% of adults are actually exercising the recommended 150 minutes per week. Clearly, having all the information on the numerous benefits of regular exercise readily available to the general public does not serve as sufficient enough motivation to increase the number of people who exercise. Motivation is a critical component to sustained participation in exercise. Increasing research has been done to explore reasons why individuals are motivated to exercise. More recently, a noncognitive trait, grit, defined as the perseverance and passion for long-term goals, has also been explored for its role in exercise. A woman by the name of Angela Duckworth has focused her life's work on defining and expanding the concept of "grit." Grit is a psychological trait used to measure a person's passion for a particular long-term goal or end state. Grit entails working strenuously toward challenges, and maintain effort and interest over years despite failures, adversity and plateaus in progress (Duckworth, 2007).

Past research suggests that motivation levels will vary depending on age, gender, and education levels. Literature also reveals that an individuals grit can vary depending on a number of different factors. Findings from this study reveal pertinent information about motivation and grit levels of members of the JGM.

## **Summary of Findings**

Prior to conducting this study, two research questions and four hypotheses were formed based on prior research and literature available on this topic. These research questions and hypotheses involved the following topics; deciphering what motivational factors influence people to exercise at the JGM, if motivation varies depending on age gender and education level and if grit levels are affected by age, gender and education level. A series of independent sample *t*-tests, one-way ANOVAs and Pearson correlations revealed that 3 of the 4 were null hypotheses. The only one that was correct was that the majority of participants were in fact intrinsically motivated.

Exploratory analyses were conducted throughout this study revealing certain significant relationships. Pearson correlation coefficient tests revealed a small, inverse relationship indicating that participants with higher BMIs tend to have lower total grit scores. A medium positive correlation was found when comparing participants total RAI and grit scores. Another medium positive correlation was found when comparing number of days exercised in the last week and total RAI score, indicating that participants who exercised more consistently in the last week tended to have higher RAI scores.

## **Conclusion**

A total of 78 usable surveys were collected through the facility and analyzed for this study. For this sample, the results from the BREQ-3 revealed that the two highest reported behavioral regulations were Intrinsic Regulation ( $M=37.96$ ) and Integrated Regulation ( $M=25.18$ ). Also, significant relationships were found between number of days exercised in the last week, external regulation, identified regulation, integrated regulation, and the overall RAI score. The primary researcher hypothesized that females and younger adults would report higher levels of

external regulation. However, our results rejected this hypothesis. There was no significant differences found between external regulation and gender/age. There were also no significant differences found between RAI and gender, education level and age of participants.

The 8-Item Grit Scale revealed that there was a significant correlation between RAI score and total grit score, which suggests that participants with higher RAI scores have higher grit scores. It was hypothesized that females would report higher grit levels than males based on the research, however an independent samples *t* test rejected that hypothesis. The results concluded that there was no significant difference between age, gender, and education levels in regards to total grit score. However, there was a small, negative linear relationship between BMI score and total grit score. The correlation suggests an inverse relationship, meaning participants with higher BMIs tend to have lower total grit scores. The results from this study population did not find any significant results regarding gender, age, and education level when compared to motivation and grit.

### **Direction for Future Research**

This research from this study may be pertinent for fitness center managers everywhere. Results from this research will contribute to a greater understanding of the role that motivation and grit play in influencing individuals to exercise. Results can then be used to provide recommendations to facility managers to help members increase motivation to exercise, contributing to increasing member satisfaction with the facility. The ability to meet the demands of customer satisfaction is essential for facility managers in the growing competitive fitness industry and this information can help managers go just that. (Theodorakis, Alexandris, Rodriguez & Sarmiento, 2004). The information garnered from this study can be used to increase exercise among individuals. Having a good grasp on what motivates individuals to exercise will allow a facility manager

to implement the proper equipment, classes and services to attract more clientele. Understanding the motives behind why people exercise will also allow a fitness facility manager to foster an environment where customers are reaching their goals, which ultimately leads to higher customer satisfaction.

The results of this study cannot be generalized to all individuals who exercise at a fitness facility, as it only included members from the JGM. Again, this fitness center is open to students, faculty and staff, and general community members in the area. We were only able to analyze 78 surveys, which is not a large number. We implore future researchers to study a larger, more diverse population.

It is recommended that future researchers conduct a more observational, longitudinal study with qualitative elements. They could observe a particular group for a longer period of time and ask them to explain their exercise goals and why they are motivated to achieve them. Motivation and grit levels could be assessed using similar surveys. When the observational period, the relationship between people who accomplished their exercise goals and their motivation and grit levels could be examined.

Furthermore, we believe the relationship between motivation, grit and exercise should be investigated further. Prior research shows motivation plays a strong role in getting people to start exercising and continue exercising over long periods of time. Grit is a relatively new topic with a lot of room for more research. Exercise is so vital and instrumental in living a healthy, prolonged life so figuring out how to increase the number of people who exercise is very important.

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## Appendix A

### Informed Consent

Principal investigator:  
Kelly Anthony  
Graduate Assistant  
Department of Kinesiology,  
Health and Sport Science  
[rwmw@iup.edu](mailto:rwmw@iup.edu)  
610-291-0721

Co-Investigator:  
Dr. Richard Hsiao  
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724-357-0123

You are invited to participate in this research study on a voluntary basis. When reading through the below paragraphs, if you have any questions, we ask that you contact us via the contact information listed above. The purpose of this study is to determine the motivational factors that influence members of the James G. Mill Fitness Center to exercise.

You have been invited because you are a member of the fitness center and you meet the necessary criteria to fill out this questionnaire. This means that you identify as male or female and fall between the ages of 18 and older. If you do not meet this criteria please do not complete this survey.

All potential participants who meet these criteria will be asked to fully complete the questionnaire located in the Zink Hall fitness center. This questionnaire should take no longer than fifteen minutes to fill out. We ask that you fill this out fully and on your own. As extra incentive to complete this survey, your name will be entered into a pool to win a one month extension on your current membership.

By completing this study you will help add to information on factors that motivate individuals to exercise. This study will not involve any risks or discomfort that is greater than the normal amount the participant experiences on a daily basis. However some of these questions are of a personal nature – please fill them out to the best of your ability.

The data collected will only be viewed by the principal and co-investigator along with two other faculty members on the thesis board. The information obtained will be kept in a private folder that only the principal and co-investigator will have access to. All data will be reported in an aggregate manner.

Your participation is strictly on a voluntary basis. You do not have to participate and you may decide to withdraw at any point without penalty by contacting the principle investigator or the co-investigator. All data collected during the study will be kept for three years in compliance with federal regulations in a safe locked place that will only be accessible to the principle investigator. The research team greatly appreciated the time you are taking to fill out this survey.

THIS PROJECT HAS BEEN APPROVED BY THE INDIANA UNIVERSITY OF PENNSYLVANIA INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS (PHONE: 724-357-7730)



## Appendix B

### BREQ-3 Cover Letter

**Project Title:** An evaluation of motivational factors that influence individuals to exercise at an academic fitness center.

Primary investigator:

Kelly Anthony  
Graduate Student, Sport Management  
Indiana University of Pennsylvania  
Phone: 724-357-2771  
Email: [rwmw@iup.edu](mailto:rwmw@iup.edu)

Co-Investigator:

Dr. Richard Hsiao  
Professor  
Indiana University of Pennsylvania  
Phone: 724-357-0123  
Email: [hsiao@iup.edu](mailto:hsiao@iup.edu)

**Please read the following information:**

The primary purpose of this study is to evaluate motivational factors that influence individuals to exercise. Participation in this study includes completion of a background questionnaire as well as a Behavioral Exercise Regulations Questionnaire (BREQ-3) and a Short Grit Questionnaire. This questionnaire will take no longer than approximately 15 minutes to fill out. The results will be confidential and only reviewed by the primary investigator and co-investigator of the study.

Participation in this study is completely voluntary. You can choose to not participate in the study or you may withdraw from the study at any time while taking the questionnaire. There is no known risk for participating in this study. If you choose to participate, you will be entered in a drawing for a chance to win a one month extension on your gym membership. The information collected from the study will be used for a Master's thesis, but your name and any personal information will not be released at any time during the study.

If you have any questions at any time, please feel free to contact the primary investigator or co-investigator. There is no known risk for participating in this study and by completing this questionnaire you are giving consent to participate. This research study will be approved by the Indiana University of Pennsylvania Institutional Review Board.

Thank you for your time and support in this research study.

Kelly Anthony  
Graduate Assistant, Sport Management  
Indiana University of Pennsylvania  
Phone: 724-357-2771  
Email: [rwmw@iup.edu](mailto:rwmw@iup.edu)



Appendix C

Survey Instrument

Section 1: Demographics

- 1.) Name: \_\_\_\_\_
- 2.) Gender:  Male  Female
- 3.) Age: \_\_\_\_\_
- 4.) Height: \_\_\_\_\_
- 5.) Weight: \_\_\_\_\_
- 6.) Education Level:  High school  College  Higher than College
- 7.) Type of Membership:  student  Faculty/staff  General community
- 8.) Number of times you exercised in the last week: \_\_\_\_\_

**EXERCISE REGULATIONS QUESTIONNAIRE (BREQ-3)**  
**WHY DO YOU ENGAGE IN EXERCISE?**

We are interested in the reasons underlying peoples’ decisions to engage or not engage in physical exercise. Using the scale below, please indicate to what extent each of the following items is true for you. Please note that there are no right or wrong answers and no trick questions. We simply want to know how you personally feel about exercise. Your responses will be held in confidence and only used for our research purposes.

	<b>Not true for me</b>	<b>Sometimes true for me</b>	<b>Very true for me</b>
1 It’s important to me to exercise regularly	0	1 2 3 4	
2 I don’t see why I should have to exercise	0	1 2 3 4	
3 I exercise because it’s fun	0	1 2 3 4	
4 I feel guilty when I don’t exercise	0	1 2 3 4	
5 I exercise because it is consistent with my life goals	0	1 2 3 4	

6	I exercise because other people say I should	0	1	2	3	4
7	I value the benefits of exercise	0	1	2	3	4
8	I can't see why I should bother exercising	0	1	2	3	4
9	I enjoy my exercise sessions	0	1	2	3	4
10	I feel ashamed when I miss an exercise session	0	1	2	3	4
11	I consider exercise part of my identity	0	1	2	3	4
12	I take part in exercise because my friends/family/partner say I should	0	1	2	3	4
13	I think it is important to make the effort to exercise regularly	0	1	2	3	4
14	I don't see the point in exercising	0	1	2	3	4
15	I find exercise a pleasurable activity	0	1	2	3	4
16	I feel like a failure when I haven't exercised in a while	0	1	2	3	4
17	I consider exercise a fundamental part of who I am	0	1	2	3	4
18	I exercise because others will not be pleased with me if I don't	0	1	2	3	4
19	I get restless if I don't exercise regularly	0	1	2	3	4
20	I think exercising is a waste of time	0	1	2	3	4

		<b>Not true for me</b>		<b>Sometimes true for me</b>		<b>Very true for me</b>
21	I get pleasure and satisfaction from participating in exercise	0	1	2	3	4
22	I would feel bad about myself if I was not making time to exercise	0	1	2	3	4
23	I consider exercise consistent with my values	0	1	2	3	4
24	I feel under pressure from my friends/family to exercise	0	1	2	3	4

Directions for taking the Grit Scale: Please respond to these 8 items by circling the number for your response. Be honest – this is an opinion survey so there are no right or wrong answers!

1. New ideas and projects sometimes distract me from previous ones.
  1. Very much like me
  2. Mostly like me
  3. Somewhat like me
  4. Not much like me
  5. Not like me at all
  
2. Setbacks (delays and obstacles) don't discourage me. I bounce back from disappointments faster than most people.
  1. Very much like me
  2. Mostly like me
  3. Somewhat like me
  4. Not much like me
  5. Not like me at all
  
3. I have been obsessed with a certain idea or project for a short time but later lost interest.
  1. Very much like me
  2. Mostly like me
  3. Somewhat like me
  4. Not much like me
  5. Not like me at all
  
4. I am a hard worker.
  1. Very much like me
  2. Mostly like me
  3. Somewhat like me
  4. Not much like me
  5. Not like me at all



5. I often set a goal but later choose to pursue (follow) a different one.
  1. Very much like me
  2. Mostly like me
  3. Somewhat like me
  4. Not much like me
  5. Not like me at all
  
6. I have difficulty keeping my focus on projects that take more than a few months to complete.
  1. Very much like me
  2. Mostly like me
  3. Somewhat like me
  4. Not much like me
  5. Not like me at all
  
7. I finish whatever I begin.
  1. Very much like me
  2. Mostly like me
  3. Somewhat like me
  4. Not much like me
  5. Not like me at all
  
8. I am diligent (hard working and careful).
  1. Very much like me
  2. Mostly like me
  3. Somewhat like me
  4. Not much like me
  5. Not like me at all

**Thank you for taking part in our research!**



## Appendix D

### Email Cover Letter

Dear James G. Mill Fitness Center member,

You are invited to participate in this research study because you are a current member of the James G. Mill Fitness Center. The following information is to help you decide if you would like to participate in the study or not. I am available to answer any questions you may have.

The primary purpose of this study is to evaluate motivational factors that influence individuals to exercise. Participation in this study includes completion of a background questionnaire as well as a Behavioral Exercise Regulations Questionnaire (BREQ-3) and a Short Grit Questionnaire. This questionnaire will take no longer than approximately 15 minutes to fill out. The results will be confidential and only reviewed by the primary investigator and co-investigator of the study.

Participation in this study is completely voluntary. You can choose to not participate in the study or you may withdraw from the study at any time while taking the questionnaire. There is no known risk for participating in this study. If you choose to participate, you will be entered in a drawing for a chance to win a one month extension on your gym membership. The information collected from the study will be used for a Master's thesis, but your name and any personal information will not be released at any time during the study.

If you have any questions at any time, please feel free to contact the primary investigator or co-investigator. This study will be approved by the Indiana University of Pennsylvania Institutional Review Board.

Primary investigator:

Kelly Anthony  
Graduate Assistant, Sport Management  
Indiana University of Pennsylvania  
Phone: 724-357-2771  
Email: rwmw@iup.edu

Co-Investigator:

Dr. Richard Hsiao  
Professor  
Indiana University of Pennsylvania  
Phone: 724-357-0123

I thank you for your time and support in this research study. Click this link if you agree to participate in this study: \_\_\_\_\_

Sincerely,

Kelly Anthony  
Sport Management Graduate Assistant  
Indiana University of Pennsylvania



## Appendix E

### Follow Up Email

Dear James G. Mill Fitness Center Member,

This is a reminder that you can still participate in the study concerning male and female collegiate student-athletes attitudes and perceptions toward male and female coaches. The questionnaire will take approximately 15 minutes to complete.

To those who have not completed the questionnaire, if you wish to participate in the study, please click the link below. Participation is completely voluntary. If you choose to participate, you will be entered in a drawing for a chance to win a one month extension on your gym membership. The information collected from the study will be used for a Master's thesis, but your name and any personal information will not be released at any time during the study. In addition, all information will only be reviewed by the primary investigator and co-investigator of the study. Your response will add valuable information in the topic of motivational factors that influence people to exercise.

If you have any questions please do not hesitate to contact the primary investigator or co-investigator of the study. This study will be approved by the Indiana University of Pennsylvania Institutional Review Board.

If you are interested in participating in this study, please click the following link: \_\_\_\_\_

Primary investigator:

Kelly Anthony  
Graduate Assistant, Sport Management  
Indiana University of Pennsylvania  
Phone: 724-357-2771  
Email: [rwmw@iup.edu](mailto:rwmw@iup.edu)

Co-Investigator:

Dr. Richard Hsiao  
Professor  
Indiana University of Pennsylvania  
Phone: 724-357-0123  
Email: [hsiao@iup.edu](mailto:hsiao@iup.edu)

Thank you for your time and participation!

Sincerely,

Kelly M. Anthony  
Sport Management Graduate Assistant  
Indiana University of Pennsylvania