WHICH TYPE OF MOTIVATION IS CAPABLE OF DRIVING ACHIEVEMENT BEHAVIORS SUCH AS EXERCISE IN DIFFERENT PERSONALITIES?

BY

RAJA AMJOD

THESIS

Submitted in the partial fulfillment of the requirements for the degree of Master of Science in Kinesiology in the Graduate College of the University of Illinois at Urbana-Champaign, 2017

Urbana, Illinois

Adviser:

Professor Steven Petruzzello
ABSTRACT

Introduction/Aim: Physical inactivity has been cited as a leading cause of noncommunicable disease, disability, and hundreds of thousands of preventable deaths worldwide each year. It is imperative to recognize that factors related to physical activity and those encouraging exercise could help one understand what it is that brings about an increase in adherence rates. Specifically, the relationship between motivation, personality, and fidelity to behaviors such as exercise should be investigated. By understanding what motivates individual personalities, we can seek challenges that serve to satisfy one or more of the needs explained by the Self-Determination Theory and form a useful foundation for developing physical activity interventions. Here, personality and motivational factors that can promote exercise frequency were explored. Methods: Participants [N=108, females (n=64), males (n=44); average age, height, and weight of 19.39 ± 4.49 yrs, 169.29 ± 17.34 cm, and 67.82 ± 15.44 kg, respectively] completed a battery of online questionnaires assessing exercise behavior, personality, and exercise motivation. Results: Exercise frequency, a proxy measure of exercise adherence, was shown to be moderately correlated with both mastery and enjoyment components of the intrinsic motivation factor, with weaker relationships seen extrinsic motives (comprising psychological condition, physical condition, social motives). Personality factors were weakly related to exercise frequency. Conscientiousness was moderately correlated (r= .328, p<.01), whereas extraversion, emotional stability, agreeableness and openness were not significantly related to exercise frequency. Intrinsic motivation (mastery, enjoyment) was moderately correlated with extraversion (rs = .366 & .316 respectively, ps<.01) and emotional stability (rs = .235 & .229 respectively, ps< .05). Agreeableness was associated with enjoyment (r = .217, p<.05) but not mastery (r= .122, p>.05), whereas openness was related to mastery (r= .216, p<.05) but not
enjoyment component ($r(106) = .167, p > .05$). Conscientiousness was unrelated to either mastery or enjoyment. **Conclusions:** The findings highlight how motivational regulation can help to better understand individual personalities and could potentially form a useful foundation for developing physical activity interventions. Results add to the literature suggesting that motivation, whether the origin is intrinsic or extrinsic to the individual, can help to characterize fidelity to physical activity by considering specific personality characteristics.
ACKNOWLEDGEMENTS

I would like to express gratitude to my adviser, Dr. Steven Petruzzello, for his guidance and instruction throughout the entire process. I am also appreciative of the members of the Exercise Psychophysiology Laboratory for assisting in data collection. Finally, I would like to thank the participants, without whom this project would not have been possible.
TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION ............................................................................................................. 1

CHAPTER 2: LITERATURE REVIEW .......................................................................................... 3

CHAPTER 3: RESEARCH METHODS ...................................................................................... 11

CHAPTER 4: RESULTS .................................................................................................................. 14

CHAPTER 5: DISCUSSION ........................................................................................................ 17

REFERENCES ............................................................................................................................. 24
CHAPTER 1
INTRODUCTION

Although exercise (a subcategory of physical activity) has been documented to promote improvements in physical and psychological health, insufficient physical activity remains a prominent risk factor for noncommunicable diseases (NCDs) such as cardiovascular diseases, cancer and diabetes. In context, “physical inactivity is estimated to cause around 21–25% of breast and colon cancer burden, 27% of diabetes and about 30% of ischaemic heart disease burden,” (WHO, 2009, p.18). That is, 5.3-5.7 million deaths globally from NCDs could have theoretically been prevented if physically inactive people had instead been sufficiently active (Kohl et al., 2012). In classification, the World Health Organization (WHO) recognized physical inactivity as the fourth leading global risk factor (responsible for 6% of deaths globally), with 1 in 4 adults globally being insufficiently active. As such, the present levels of physical inactivity continues to be undervalued despite the evidence of its harmful effects and the burden it poses. Therefore, a convincing proposal in addressing the global pandemic of physical inactivity needs to be presented.

Given that the vast majority of people living within industrialized nations suffer from this pandemic, it is understandable that an ever-increasing number of approaches are being explored to try to increase physical activity levels of the populations of countries around the world. Despite these interventions, as of 2010, the WHO estimated around 23% of adults and 81% of adolescents globally remain insufficiently physically active. According to Mullan and Markland (1997), “in the field of exercise promotion it is accepted that success in adhering to a program of regular exercise is, to a large extent, dependent on the reasons for which exercise is undertaken,”
Explicitly, in order to understand exercise adherence (i.e., adherence to regular exercise), it may be of value to begin uncovering how maintenance can be preserved.

One of the main purposes of this study was to examine plausible reasons for how exercise participation can be sustained. A limited number of investigations have focused on the relationship between motivation, personality, and fidelity to behaviors such as exercise. Motivation is often defined by behavior itself. If we can understand what motivates an individual, we can better predict and understand future behaviors. Behaviors are characterized, at least in part, by the personality makeup in an individual. Personality can be defined as the underlying, relatively stable, psychological structures and processes that organize human experience and shape a person's actions and reactions to the environment (Lox, Martin Ginis, & Petruzzello, 2014). As discussed by Huang, Lee, and Chang (2007), Self-Determination Theory (SDT) explains the influences of an individual's personality on their exercise behavior. According to SDT, individuals possess three primary psychosocial needs that are directly rooted in different types of motivation: the need for self-determination (autonomy), the need to demonstrate competence, and a need for relatedness (Lox et al.). By understanding what motivates individual personalities, we can seek challenges that serve to satisfy one or more of these needs and form a useful foundation for developing physical activity interventions.

Specifically, the following questions were addressed by exploring this topic: 1) Which type of motivation is capable of driving achievement behaviors such as exercise in different personalities? 2) Does a change in exercise behavior influence a change in motivation in an individual? and 3) Is there a direct relationship between the various forms of motivation and the different types of personalities?
CHAPTER 2
LITERATURE REVIEW

Physical Inactivity

Physical inactivity has been and remains a threat to the maintenance of the structures and functions of organs and organ systems in the human body. The lack of physical activity has caused decreased loading to locomotor, metabolic, cardiorespiratory, nervous, endocrine, and excretory organs. Remaining sedentary leads to maladaptation in these organs, decreasing their tolerance to the load and various environmental conditions. The pandemic of physical inactivity seen around the world also increases the risk of certain diseases and their precursors (e.g., being overweight, obesity). Physical inactivity leads to many health-damaging effects including loss of muscle, strength and power, osteoporosis and related fractures, osteoarthritis, low back pain, type II diabetes mellitus, hypertension, metabolic syndrome, coronary heart disease, cerebrovascular disease (stroke), peripheral vascular disease, cancer, and all-cause mortality (Vuori, 2004). By definition, physical inactivity “is the lack of sufficiently strong contractions of the muscle to stimulate its rebuilding, lack of sufficiently increased metabolism to stimulate various metabolic and other regulations, lack of sufficient amount of skill-requiring movements to maintain the motor control of movements and so on” (Vuori, p. 124). Consequently, the prevalence of physical inactivity has been linked to causes that include social and economic transitions and lack of recognition (Kohl et al., 2012).

Social changes and economic development in many populations have had an effect on health and its behavior by shifting from undernutrition and micronutrient deficiencies to overnutrition and obesity (Kohl et al., 2012). Additionally, the pursuit of sedentary behaviors has been associated with significant increased risks of developing obesity. Physical inactivity has been
argued to be the consequence rather than the cause of obesity. According to Vuori (2004), the need of energy expenditure in physical activity has decreased while keeping the amount of energy expenditure in leisure pursuits modestly stable. As a result, a major variable explaining the obesity epidemic is arguably the continued decline in daily energy expenditure coupled with a non-equivalent reduction in energy intake. According the World Health Organization (WHO), increased urbanization has resulted in several environmental factors which may discourage participation in physical activity. Such factors include: availability of unhealthy diets; fear of violence; high-density traffic; low air quality; pollution; lack of parks, sidewalks, and sports/recreation facilities.

Physical inactivity has begun to be recognized as an exposure in need of being given more attention for the control of non-communicable diseases, trailing behind tobacco and alcohol control and promotion of a healthy diet. “As a relative newcomer to the area, physical activity has yet to garner equal global organisation and advocacy power to receive the appropriate political recognition and investments” (Kohl et al., 2012). The delay in recognition is partially due to the scattered emergence of the discipline of physical activity through various areas and not being able to centralize it. Another reason for the slower recognition is that physical activity has been integrated with other health determinants, rather than being promoted as a separate course of action to facilitate impeding the prevalence of physical inactivity (Kohl et al.). The tardiness in promoting the infrastructure of physical activity to improve the health and quality of life may also be due to the lack of awareness of society’s responsibility “for providing sufficient information of the importance of regular physical activity and the opportunities to be physically active in feasible and safe ways” (Vuori, 2004, p. 140).
Motivation, Personality, & Exercise

According to Self-Determination Theory, motivation can be differentiated into three categories depending on whether the origin is internal or external to the individual (González-Cutre & Sicilia, 2012). The least self-determined form of motivation is amotivation, characterized by the absence of interest and desire to commit to exercise. Extrinsic motivation considers exercise as a means to achieve a goal, consisting of several levels of self-determination. The first is external regulation, in which the individual engages in exercise behavior to strive to obtain some external incentive. The next level is introjected regulation, in which the person is driven by the desire to avoid negative affect (e.g., feelings of guilt, shame, anxiety) while attaining self-approval and improving self-esteem. The third level is identified regulation, in which the individual values the benefits of exercise and partakes in such behaviors to optimize health physically, psychologically, and socially. The last level is integrated regulation, in which exercise behavior is adapted into the person's lifestyle. The third category of motivation, also known as intrinsic motivation, reflects behavior motivated by the inherent fun and enjoyment of the activity.

Personality has been conceptualized most recently as being comprised of the “Big 5” factors of Extraversion, Emotional Stability, Conscientiousness, Agreeableness, and Openness to experience. Extraversion (Introversion) is a tendency to be outgoing, sociable, impulsive, and active (in contrast with Introversion, the tendency to be more reserved, quiet, passive and careful). Emotional Stability is a tendency to be more even-tempered, calm and controlled (in contrast with Neuroticism or Emotionality, a tendency to be tense, anxious, moody and worried). Conscientiousness is a tendency to be more achievement/goal-oriented and self-disciplined, Agreeableness is the tendency to be kind, generous and cooperative, and Openness is the
tendency to be creative, perceptive, and willing to adjust to new ideas (see Lox et al., 2014 for more details).

Maltby and Day (2001) conducted a study on the assumption that extrinsic motives for exercise were perceived to lead to stress in individuals, thereby resulting in poorer psychological well-being; intrinsic motives for exercise were thought to lead to a release of stress, thereby resulting in better psychological well-being. Undergraduate students (102 males, 125 females) were drawn from a larger sample \( (N=556) \) of students on the criteria of reporting to exercise regularly and then split into subsamples of individuals who had been exercising for less than 6 months and individuals who had been exercising for 6 months or longer. The respondents were asked to complete four questionnaires: The Exercise Motivations Inventory 2 (EMI-2; Markland & Ingledew, 1997) to measure motives for exercising, a modified version of the Self-Description Questionnaire III (SDQIII; Marsh & O’Neill, 1984) assessing levels of self-esteem, the General Health Questionnaire (Goldberg, 1992) to provide an index of psychological well-being, and the Hassles Scale (Kanner et al., 1981) for evaluating aspects of stress. Results confirmed the initial assumptions and further indicated the individuals who had been exercising for less than 6 months were more extrinsically motivated whereas those who had been exercising for 6 months or longer tended to be more intrinsically motivated.

Huang, Lee, and Chang (2007) extensively reviewed several studies examining personality and exercise behavior. They showed that the “big five” personality factors (i.e., Emotional Stability, Extraversion, Agreeableness, Conscientiousness, and Openness to experience) had a positive influence on exercise motivation and engagement. That is, exercise participation was associated with higher levels of Extraversion, Emotional Stability, and Conscientiousness. In particular, Conscientiousness was most strongly related to engagement in exercise behavior,
being mediated by the intentions to the goal (motivation for health protection) and the specific behavior (exercising).

Moreover, Costa, Oliva, and Cuzzocrea (2014) recruited 474 male and female participants (at approximately a 50-50% ratio) who exercised regularly. Questionnaires were given to evaluate personality, motivational regulation, and exercise frequency. To assess personality, the Big Five Questionnaire (BFQ, Caprara, Barbaranelli & Borgogni, 1993) was used and the assessment of motivational regulation was done with the Behavioral Regulation in Exercise Questionnaire-2 (BREQ-2; Markland & Tobin, 2004). Exercise frequency was ascertained with two questions: 1) how many days/week do you exercise? and 2) how many hours/day do you exercise?

Correlations and a hierarchical regression analysis were conducted to determine the relationships among the variables examined. Based on the results, Costa et al. concluded that personality predicted frequency of exercise and motivational regulation provided a significant contribution to promoting exercise frequency. It was also concluded that there was a strong relationship between personality and motivation. Specifically, high levels of extraversion/energy and lower agreeableness/friendliness traits were predictive of exercise frequency, and this influence was stronger when motivational regulation was introduced into the model. That is, motivational regulation resulted in a negative association with external regulation and a positive association with identified regulation and intrinsic motivation on exercise frequency. Further, these findings indicated that extraversion/energy and conscientiousness were negatively related with amotivation and external regulation while maintaining a positive relationship with identified regulation and intrinsic motivation. Emotional stability was found to be negatively correlated with external and introjected regulation, and openness was positively associated with intrinsic motivation.
Another study conducted by Lewis and Sutton (2011) used a voluntary convenient sample (50 male, 50 female undergraduate students) and assessed personality, motivational regulation, and exercise frequency. To assess personality, the Questionnaire from the International Personality Item Pool (IPIP; Goldberg et al., 2006) was given, the BREQ-2 was used to assess motivational regulation, and exercise frequency was assessed using a 6-point Likert scale. Results revealed: a positive correlation between extraversion and conscientiousness with exercise frequency, intrinsic and external motivation; a negative correlation between agreeableness and exercise frequency; a positive correlational increase in exercise participation with an increase in autonomy; and a negative correlation between external regulation and amotivation.

In a final study, Mullan and Markland (1997) had 314 male and female participants complete questionnaires to assess motivational regulation and stages of change for exercise behavior. The Behavioral Regulation in Exercise Questionnaire (BREQ; Mullan, Markland & Ingledew, 1997) was used to assess motivational regulation and a visual-analogue stages of change ladder was used to measure stages of change for exercise behavior. The stages of change model proposes a change in behavior through a series of five stages ranging from no change to successful maintenance of change. The first stage, also known as the Precontemplation stage, is where an individual is unaware of any problem, and consequently does not consider change. In the Contemplation stage, one is aware of the problematic behavior and evaluates the benefits of a lifestyle change without making any commitment to change. In the Preparation stage, the individual has made a commitment to change and begins to attempt small behavioral and lifestyle changes to be implemented. In the Action stage, one is actively engaged to acclimate the changes in behavior and lifestyle modifications. In the final stage of the model, the Maintenance stage, individuals work to sustain the changes made and avoid relapse. Results indicated people
to be more self-determined and portray intrinsic forms of behavioral regulation in the latter stages of change compared to earlier stages.

Overall, the results from the individual literatures support one another. The personality factors of extraversion and conscientiousness portray higher levels of intrinsic motivation. High levels of intrinsic motivation result in an increase in exercise frequency as well as maintenance of this increased behavior. These findings advocate for interventions to increase physical activity levels and exercise frequency by focusing on prescribing activities that are intrinsically enjoyable to people, recognizing that these are likely to differ among individuals.

Nevertheless, the exploration of the relationships between personality traits, motivation and exercise behavior is still at an early stage and for this reason it is necessary to further explore the interaction. The Transtheoretical Model (TTM) integrates current behavioral status with an individual’s intention to maintain/change behavior through a series of stages (i.e., Precontemplation, Contemplation, Preparation, Action, and Maintenance; Sallis & Hovell, 1990). As an exploratory analysis, the present study aimed to investigate whether changes in exercise behavior (i.e., progression through stages of the TTM) were associated with personality traits (i.e., more extraverted) and intrinsic motivation. In keeping with the available literature, it was hypothesized that:

1. Intrinsic motivation would be correlated (positively) with exercise frequency.
2. Extrinsic motivation would be correlated (negatively) with exercise frequency.
3. Extraversion, emotional stability, and conscientiousness would be correlated (positively) with exercise frequency.
4. Agreeableness and openness would be negatively related to exercise frequency.
5. Personality (i.e., openness, conscientiousness, extraversion, agreeableness, and emotional stability) would be positively associated with intrinsic motivation.
CHAPTER 3

RESEARCH METHODS

Participants

In this study, 108 (64 females, 44 males) undergraduate students were asked to participate. The sample had a self-reported average age of $19.39 \pm 4.49$ years, average height of $169.29 \pm 17.34$ centimeters, and average weight of $67.82 \pm 15.44$ kilograms. All participants completed a health history form and informed consent document prior to engaging in the study.

Measures

Personality. Personality traits were measured using the International Personality Item Pool (IPIP; Goldberg et al., 2006). The 50-item IPIP evaluates the Big 5 personality factors [extraversion, emotional stability, conscientiousness, agreeableness, and intellect/imagination (openness)] on a 5-point Likert scale ranging from 1 (very inaccurate) to 5 (very accurate). The range of scores on each factor is from 10 to 50 because each factor is assessed with 10 items.

Exercise Habits. Exercise habits were measured using a self-reported Health & Fitness Inventory and further categorized using the Transtheoretical Model (TTM; Sallis & Hovell, 1990). The Health & Fitness Inventory consisted of questions asking participants about their exercise behaviors, namely self-reported exercise frequency, duration, and intensity. With exercise frequency, participants were asked how many days per week, on average, they exercised and how long they have been exercising on a regular basis (in months/years). With exercise duration, participants were asked how long (in minutes) they exercised, on average, per exercise session. For exercise intensity, participants were asked to rate how hard they worked during an average exercise session on a 10-point category-ratio scale (0 = not at all; $\frac{1}{2}$ = very, very light; 1 = very light; 2 = light; 3 = moderate; 4 = somewhat hard; 5 = hard; 7 = very hard; 10 = very, very
hard; Borg, 1998). The TTM categorizes participants into one of five stages, namely preparation, pre-contemplation, contemplation, action, and maintenance, based on a nominal scale (yes/no) assessing physical activity readiness.

**Motivational Regulations.** Motivational regulations were assessed using the Physical Activity and Leisure Motivation Scale (PALMS; Zach, Bar-Eli, Morris & Moore, 2012). The 40-item PALMS assesses eight motives for participation in physical activity, namely mastery, enjoyment, psychological condition, physical condition, appearance, others’ expectations, affiliation, competition/ego, on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The eight motives can be categorized as features of intrinsic and extrinsic motivation based on Self-Determination Theory. The intrinsic motivation factor is comprised of mastery and enjoyment, extrinsic (body-mind) motivation is comprised of psychological condition, physical condition, and appearance, and extrinsic (social) motivation includes others’ expectation, affiliation, and competition/ego. The range of scores for each of the PALMS subscales is 5 to 25 because each subscale has five items.

The PALMS has been shown to be a valid measure (e.g., Molanorouzi, Khoo, & Morris, 2014). In the present sample, internal consistencies of the subscales were shown to range from .668 (others’ expectations) to .931 (affiliation). In other words, the PALMS seems to provide reliable measures of the various motives it purports to assess.

**Protocol**

Details of the nature of the study were explained to participants and they were given the opportunity to have any question or concern addressed to the best of the researcher’s ability. When all questions were answered, participants read and signed an informed consent document approved by the University’s Institutional Review Board. Participants were reminded that they
could choose to decline the use of their data at any time without prejudice or penalty and that if any questions came up during the course of their participation, they were encouraged to utilize the contact information displayed on the consent form. Participants were then administered a battery of online questionnaires via Google Drive link, with a one week period to complete the survey.

Analysis/Data Collection

Statistical analysis was conducted using SPSS 22.0.0.0 for prediction and association. Specifically, Pearson correlation coefficients were used to determine the strength of the linear relationship between two variables. Significance levels were set at $p \leq .05$. 
CHAPTER 4
RESULTS

It was hypothesized that intrinsic motivation would be correlated with exercise frequency. To address this hypothesis, a Pearson correlation coefficient was calculated for the relationship between the intrinsic motivation factor of PALMS and self-reported exercise behaviors (e.g., frequency, duration, intensity). A moderate correlation was found for both the mastery and enjoyment components of the intrinsic motivation factor with exercise frequency \[ r(106) = .376, p<.001 \] & \[ r(106) = .540, p<.001 \], respectively, indicating a significant relationship between the two variables.

It was hypothesized that extrinsic motivation would be negatively related to exercise frequency. To test this hypothesis, a Pearson correlation coefficient was calculated for the relationship between the extrinsic body-mind and social motives factor of PALMS and self-reported exercise behaviors. The extrinsic body-mind motives factor comprising psychological condition, physical condition, and appearance revealed a low positive correlation with exercise frequency \[ r(106) = .216, p=.025, .205, p=.033, & .228 p=.018, \] respectively. Additionally, the extrinsic social motives factor exposed a weak correlation that was not significant \[ r(106) = -.056, p>.05 \] between others’ expectation and exercise frequency, while affiliation and competition/ego validated a significantly low positive correlation \[ r(106) = .225, p=.019 \] for affiliation; \[ r(106) = .296, p=.002 \] for competition/ego] with exercise frequency. Results suggest an overall significant positive relationship between the two variables.

As this study’s third and fourth hypothesis, it was hypothesized that a positive correlation of extraversion, emotional stability, and conscientiousness exist with exercise frequency while a negative correlation of agreeableness and openness exist with exercise frequency. To examine
these hypotheses, a Pearson correlation coefficient was calculated for the relationship between
the Big 5 personality factors of IPIP [Extraversion, Emotional Stability, Conscientiousness,
Agreeableness, and Intellect/imagination (Openness)] and self-reported exercise behaviors. Of
the first three personality factors, Conscientiousness is the only measure to approach
significance, resulting in a moderate positive correlation with exercise frequency \( r_s(106) = .328,\)
\( p < .001 \), whereas Extraversion and Emotional Stability were not significantly related to exercise
frequency \( r(106) = .170, p = .078 \) & \( .115, p = .24 \). Furthermore, with regards to Agreeableness
and Openness, both were insignificantly correlated to exercise frequency \( r_s(106) = .177, p =
.067 \) & \( .061, p > .05 \), respectively].

To further explore the nature of these relationships, hierarchical regressions analyses were
performed. After accounting for age and sex, Conscientiousness predicted an additional 10.4%
unique variance in exercise frequency \( F_{change}(1, 1024) = 11.95, \beta = 0.331, p = .001 \). Mastery
predicted an additional 11.8% unique variance in exercise frequency \( F_{change}(1, 101) = 15.42, \beta =
0.346, p < .001 \). When Enjoyment was entered as a predictor in place of Mastery, an additional
26.3% unique variance in exercise frequency was explained \( F_{change}(1, 101) = 42.45, \beta = 0.516,
 p < .001 \).

Addressing this study’s final hypothesis, it was hypothesized that a positive correlation of
Extraversion, Emotional Stability, Agreeableness, Openness, and Conscientiousness exist with
intrinsic motivation. To analyze this hypothesis, a Pearson correlation coefficient was calculated
for the relationship between the Big 5 personality factors of IPIP and the intrinsic motivation
factor of PALMS. First, a moderate positive correlation was found for Extraversion with both
mastery and enjoyment components of the intrinsic motivation factor \( r_s(106) = .366, p < .001 \)
& \( .316 \) respectively, \( p = .001 \). Secondly, Emotional Stability was significantly correlated with both
mastery and enjoyment components of the intrinsic motivation factor \( r_s(106) = .235, p = .014 \) and \( .229, p = .017 \)), indicating a low positive relationship. Agreeableness, though low in strength, was positively associated with the enjoyment component of the intrinsic motivation factor \( r(106) = .217, p = .024 \)] while holding no relationship with the mastery component \[ r(106) = .122, p = .21 \]. Conversely, Openness was significantly related to the mastery component of the intrinsic motivation factor \[ r(106) = .216, p < .05 \] and revealed to have an insignificantly weak correlation with the enjoyment component \[ r(106) = .167, p > .05 \]. Finally, it is worth noting that Conscientiousness portrayed no significant relationship with either the mastery or the enjoyment components of the intrinsic motivation factor \[ r_s(106) = .110 \) and \( .107, p > .25 \), respectively].

Though it was not explicitly hypothesized and rather an exploratory analysis, one of the secondary aims of this study was to investigate if changes in exercise behavior (i.e. progression of the TTM) induce personality traits to be more extraverted and intrinsically motivated. Via calculation of a Pearson correlation coefficient, a moderate positive correlation was found between both mastery and enjoyment components of the intrinsic motivation factor \[ r(106) = .305 \) and \( .404 \) respectively, \( p < .01 \) and the Transtheoretical Model (TTM). Furthermore, there was no significant association between personality traits being more extraverted and the TTM \[ r(106) = .136, p > .05 \].
CHAPTER 5

DISCUSSION

The present study sought to examine plausible explanations for how exercise participation can be sustained over the long term. Specifically, an investigation of the relationship between motivation, personality, and adherence to exercise behaviors was performed. By understanding what motivates individuals, by understanding how personality impacts exercise behavior, and by understanding the interaction of motivation and personality, we can better seek challenges that serve to satisfy one or more of the needs explained by Self-Determination Theory. This could ultimately form a useful foundation for developing physical activity interventions. As noted earlier, it was hypothesized that:

1. Intrinsic motivation would be correlated (positively) with exercise frequency.
2. Extrinsic motivation would be correlated (negatively) with exercise frequency.
3. Extraversion, Emotional Stability, and Conscientiousness would be correlated (positively) with exercise frequency.
4. Agreeableness and Openness would be negatively related to exercise frequency.
5. Personality (i.e., Extraversion, Emotional Stability, Conscientiousness, Agreeableness, and Openness) would be positively associated with intrinsic motivation.

The results of the present study supported the initial hypothesis, indicating that individuals who report greater intrinsic motives for participation in physical activity (i.e., mastery, enjoyment) tend to be more frequent in their exercise behaviors. This finding was consistent with previous research. Research indicates those who report higher levels of intrinsic motivation are more likely to overcome barriers to exercise than those who report high levels of...
extrinsic motivation (Costa, Oliva, & Cuzzocrea, 2014; Lox, Martin Ginis, & Petruzzello, 2014; Maltby & Day, 2001; Mullan & Markland, 1997). Even more specifically, the participants in this study showed greater motivation for the enjoyment of exercise than for improving of their skills (i.e., mastery). This may suggest exercise adherence is best achieved through the fun and satisfaction innate in the physical activity and less so by mastering techniques involved in the achievement behavior.

The second hypothesis proposed that extrinsic motivation would be negatively correlated with exercise frequency. The findings of this study actually refute this hypothesis. Results revealed a small but significant positive correlation between extrinsic body-mind factors (i.e., psychological condition, physical condition, appearance) and exercise frequency as well as two of the three subcomponents of extrinsic social motives (i.e., affiliation, competition/ego). This indicates that those who report stronger extrinsic motives for participation in physical activity tend to be more frequent in their exercise behaviors. As discussed by Frederick and Ryan (1993), exercise/fitness group participants typically engage in physical activity for instrumental reasons that can be classified as extrinsic motives. Results of the current study show the participants to be primarily interested in competition/ego, appearance, and affiliation with psychological and physical condition being reported as least significant amongst these factors. This may suggest exercise is engaged for the competition or challenge inherent in the physical activity (i.e., competition/ego) to look good (i.e., appearance) in order to gain social approval (i.e., affiliation), giving peripheral attention to overall psychological and physical health benefits. Through a pragmatic lens, it is of no surprise that the participants of this study (e.g., college students) seem to be more interested in enhancing their looks and maintaining a good physique.
Partially supporting the third hypothesis, while rejecting the fourth hypothesis, the results of the present study imply that greater Conscientious was associated with more frequent physical activities. As discussed by Costa, Oliva, and Cuzzocrea (2014), Extraversioin implies an energetic approach including traits such as assertiveness and sociability; Agreeableness suggests a communal orientation towards others including traits such as sympathy and trust; Conscientiousness refers to a focus on responsibilities and can be characterized by planning, organizing, and self-discipline; Openness to experience/intellect describes the tendency to be perceptive, creative, and appreciative of aesthetics; Emotional Stability is the opposite of neuroticism, contrasting characteristics such as anxiety and negative emotionality. Here, the findings of the current study suggest that Conscientiousness is a particularly relevant factor for predicting exercise adherence (as indexed by exercise frequency, as shown in the hierarchical regression analyses. It is not surprising that Conscientious individuals tend to be more adherent to exercise, because they have the tendency to show higher levels of self-discipline and the need for achievement.

On the other hand, not seeing a meaningful relationship between Extraversioin and exercise frequency was inconsistent with previous literature. An exploratory analysis did show a significant correlation for Extraversioin with exercise duration \( r(106) = .194, p = .044 \). This finding may explain the insignificant relationship between exercise frequency and extraversion. Individuals with a high score in Extraversioin tend be more energetic, which may explain why they engage in longer bouts of exercise behavior than regularity to physical activity. Exercise frequency appears to rely more on structured planning than it does to amounts of energy.

The trivial relationship between Agreeableness and exercise frequency can be understandable because persons who report high levels of this trait tend to carry more social qualities, such as
cooperativeness and friendliness, which may encourage them to give priority to other social activities. It would be interesting to investigate how levels of Agreeableness differ when participants engage in cooperative physical activity versus individual exercise. Furthermore, the results of this study found no relationship to exist between Openness and Emotional Stability with exercise frequency. People who display high levels of Openness tend to depict a preference for variety, which may lead them to participate in other activities. Moreover, individuals who report high levels of Emotional Stability strive to be in a stable and balanced state by attempting to be free from persistent negative emotions. Exercise in itself can be recognized as a stressor that tends to induce transient physiological and psychological responses that may be perceived as negative, namely fatigue, tension, and anxiety, to individuals who pursue a relatively calm state. Such reasoning may apply to the results of the current study.

Outcomes from this study partially support the final hypothesis regarding the Big 5 personality factors and intrinsic motivation. Extraversion and Emotional Stability exhibited a significant relationship with both mastery and enjoyment, Agreeableness only with enjoyment, Openness with just mastery, while Conscientiousness presented no relationship with either component of intrinsic motivation. As discussed in Chapter 2 of the study, intrinsic motivation reflects a behavior to be motivated by the inherent fun and enjoyment of the activity. Extraverted individuals are often described as the life of the party, because they are full of energy, enjoying being with people, and are assertive. It is understandable how motivational factors may mirror such qualities in these types of individuals (i.e. they advocate enjoyment, therefore they are motivated by enjoyment; their assertiveness mirrors their motivation for mastery). Also, emotionally stable individuals tend to heavily portray intrinsic concerns such as having a need for a balanced state, which may justify their need for internal mastery and enjoyment. Agreeable
individuals reflect general concerns for social harmony, which may explain why they are primarily motivated by enjoyment rather than mastery. On the contrary, people who readily portray high levels of openness/intellect can often be described as appreciative of aesthetics. Mastery of any skill is an art in itself, requires creativity, and is sensitive to fluency, which may be associative to beauty. As such, it is not surprising that such persons are motivated by mastery.

Conscientious people have a tendency to demonstrate self-discipline and strive for achievement against outside expectations, which may clarify why no relationship is seen with intrinsic motivation. As discussed earlier, extrinsic motivation consists of several levels of self-determination. Specifically, the qualities of conscientious individuals could be seen to be motivated by introjected regulation, in which the person is driven by the desire to avoid negative affect (e.g., feelings of guilt, shame, anxiety) while attaining self-approval and improving self-esteem and by identified regulation, in which the individual values the benefits of exercise and partakes in such behaviors to optimize health physically, psychologically, and socially.

As an exploratory analysis, one of the secondary aims of this study was to investigate if differences in exercise behavior (i.e. stages of the TTM) are associated with personality traits reflective of greater extraversion and intrinsic motivation. Results indicated that individuals in more advanced stages of exercise behavior tend to be more intrinsically motivated. On the contrary, no relationship exists between exercise behavior reflected by stage and extraversion. Exercise frequency can be representative of the Maintenance Stage of the Transtheoretical Model, as both are reflective of adherence to physical activity. As such, it is not surprising to see progression through the TTM to correlate with becoming more intrinsically motivated (supported by evidence for the first hypothesis) while holding no relationship with extraversion (supported by the evidence discussed with regards to the third hypothesis).
This study aimed to examine plausible reasons for how exercise adherence can be maintained. Here, personality and motivational factors that can promote exercise frequency were explored. Results highlight how motivational regulation can contribute to better understanding individual personalities and forming a useful foundation for developing physical activity interventions. Though many of the study hypotheses were supported and are consistent with the available literature, several limitations do exist.

A limitation of the present study was the study sample, consisting primarily of university students who were pursuing majors related to Applied Health Sciences (e.g., Kinesiology). As such, the specific sample of this study is likely not representative of the population at large, who are primarily physically inactive. Future studies should attempt at including heterogeneous groups with and without a history of regular exercise behavior to further expand the findings of the current investigation. Furthermore, even with the contribution this study provides for understanding the phenomenon, it is not comprehensive. The correlational research design used in the current study delimits the implications of the results, in that a correlation between two variables does not mean that one variable causes the other. Establishing causation can only be seen with an experimental design in which an independent variable can be manipulated to bring about an effect. Future studies should explore different research designs, namely true experimental, to arrive at definitive explanations for the relationships exposed. Finally, influences of other lifestyle factors were not assessed, such as basic psychological needs or nutrition. Investigations considering these factors may provide further insights into behavioral and motivational regulation across personality traits.

Despite its limitations, the present study provides support for the proposition that there is a relationship between motivational regulation and personality factors in achievement behaviors.
such as exercise. These results add to the literature in suggesting that motivation, whether the origin is intrinsic or extrinsic to the individual, was identified to characterize fidelity to physical activity when specific personality characteristics are considered. By understanding what motivates individual personalities, we can seek challenges to enhance adherence rates to exercise behaviors and promote overall quality of life.
REFERENCES


