Personality Traits: Predicting Objectively Measured Levels of Exercise and Implicit and Explicit Attitudes toward Exercise

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Abstract

The effects of personality traits from the NEO-five-factor model have been well established as predictors of exercise. However, past research has failed to examine these factors using objectively measured levels of exercise, instead relying on self-report measures. In the current study, 35 participants completed questionnaires assessing explicit attitudes towards exercise, and personality traits as measured by the NEO-PI-3 as well as an exercise implicit association task (IAT) to assess unconscious attitudes toward exercise. Participants then wore an activity monitor for one week. Results demonstrated that agreeableness was a significant predictor of overall physical activity levels, such that greater levels of agreeableness were associated with less overall exercise. Conscientiousness and openness were associated with beliefs about the mental health benefits of exercise at a trend level, such that higher levels of each trait were associated with greater belief that exercise has mental health benefits. In addition, neuroticism emerged as a significant predictor of negative explicit attitudes about exercise such that higher levels were associated with increased belief in exercise being unpleasant/negative. Lastly, contrary to hypotheses, none of the NEO Big 5 traits emerged as significant predictors of implicit attitudes towards exercise. These results can help healthcare providers better identify individuals at risk for exercise avoidance.

Keywords: exercise, objectively measured exercise, implicit exercise attitudes, explicit exercise attitudes, personality traits, 5-Factor Model, NEO-PI-3

Predicting Objectively Measured Exercise and Exercise Attitudes using Personality Traits

Despite the necessity of daily exercise and physical activity, population studies have demonstrated that only about 50% of American adults participate in enough physical activity to garner health benefits (Berry et al., 2013). Such statistics are particularly concerning as lack of physical activity is associated with increased body mass index (BMI), increased rates of cardiovascular disease, increased levels of depression and anxiety, and higher all-cause mortality rates (Hanson et al., 2017). In fact, two-thirds of the American population currently meets criteria for overweight or obese status (CDC, 2012). Therefore, the identification of individuals who are less likely to exercise or hold negative attitudes toward exercise is an important first step in creating tailored interventions to increase this important health behavior.

The investigation of attitudes, biases, and personality traits has become increasingly common in understanding exercise avoidance and negative health consequences such as obesity. Early research largely focused on implicit and explicit anti-fat bias as well as self-reported exercise and personality traits geared toward understanding how one's exercise habits may come to formation internally (Mottus et al., 2017; Berry et al., 2013). However, personality traits may be one of the most important factors to explain exercise levels and attitudes towards exercise. Specifically, investigators have begun to explore how personality traits from the 5-factor model (openness, conscientiousness, extraversion, agreeableness and neuroticism) predict exercise dependence and engagement in physical athletics (Forrest el., 2016; Mottus et al., 2017). Evidence suggests that personality traits may be predictors of BMI and development of certain exercise-related feelings and behaviors as well. More specifically, previous studies have shown that certain traits such as conscientiousness, extraversion, and openness are related to increased levels of exercise and exercise dependence while traits such as neuroticism and agreeableness are

related to lower exercise levels/intensities and less frequent exercise in general (Butcovik et al., 2017; Wilson et al., 2015; Courneya et al., 1998 & Forrest et al., 2016) .

For example, Courneya et al. (1998) observed that each of the Big Five dimensions were correlated with theoretically expected exercise motives, attitudes, and preferences for exercise content and structure. Specifically, they demonstrated that extraversion and conscientiousness were positively related, whereas neuroticism was negatively related to exercise behavior. An additional finding also demonstrated that higher levels of neuroticism were related to less exercise and less positive exercise attitudes, while higher levels off conscientiousness were related to more exercise and more positive exercise attitudes. Similarly, Butkovic et al., (2017) demonstrated that individuals who scored high in extraversion and low on neuroticism reported exercising more often and more intensely.

While previously mentioned studies have used community samples, it is important to consider the personality traits of those extraordinarily active, exercising frequently for sport or recreation (athletes) for comparison. Malinauskas et al. (2014) examined such participants by observing the personality traits of athletes versus non-athletes. Results demonstrated that athletes scored higher than non-athletes for conscientiousness. In addition, team sport athletes scoring higher in extraversion than athletes performing endurance or individualized sports. Taken together, the results of these studies highlight the importance of using personality traits to predict those who may be at risk for exercise avoidance.

Much like personality traits, it is also important to understand attitudes towards exercise as well—specifically implicit and explicit attitudes towards exercise. In fact, many researchers have begun to explore the effects of one's implicit and explicit attitudes towards exercise, others they observe exercising, their own personality traits and the possible interaction and causal force

these factors may have on body mass index (BMI) and subsequent exercising habits (Butcovik et al., 2017; Berry et al., 2013; Wilson, 2015). Early research largely focused on implicit and explicit anti-fat bias as well as self-reported exercise and personality traits geared toward understanding how one's exercise habits may come to formation internally (Mottus et al., 2017; Berry et al., 2013). Understanding implicit attitudes allows us to access innate biases or cognitions that may not be as readily admitted on more explicit measures. Typically, such attitudes are assessed through Implicit Association Tasks (IAT's) where individuals respond to stimuli of interest at a response rate that does not allow for full cognitive processing and subsequent adjustment of response due to social desirability to occur. This may be of particular clinical utility here to understand exercise attitudes and their subsequent behaviors considering often times internal attitudes are much different than what is presented or stated (external).

For example, Berry et al. (2013) used an Implicit Association Task (IAT) and self-report measures to examine implicit and explicit attitudes towards exercise after a priming exposure to others exercising. Results demonstrated that participants who watched the *Biggest Loser* video had significantly lower explicit, but not implicit, attitudes towards exercise than those in the control condition. Berry et al. (2016) furthered this line of research by examining exercise attitudes in response to exercise information targeted to pre-test explicit attitudes. Here, participants completed a pre-test measure of implicit and explicit attitudes about exercise and then one week later read information that was targeted to influence explicit affective (written/conscious emotion) or instrumental attitude (behavioral beliefs/emotion) about exercise. Results demonstrated that there were changes in implicit attitudes in both instrumental message conditions that furthered the hypothesis that anti-attitude information would result in implicit attitude changes, while on the other hand, information that targeted congruent attitudes would

display changes in retaining and matching the information presented. Overall, results of this study showed the importance of how internal cognitions can change and predict exercise outcomes if properly examined and understood.

With this in mind, it is important to consider the work of Forrest and Clerkin (2016). In this study, they examined if explicit, self-reported symptoms of exercise dependence and an implicit association of exercise could predict exercise behaviors and a subsequent change in negative/problematic exercise attitudes. Tracking undergraduate daily exercise attitudes for a month, and the administration of an IAT and Exercise Dependency Questionnaire (EDQ), researchers found that implicit attitudes of exercise dependency at time 1 predicted time 2 EDQ scores. Furthermore, results demonstrated that time 1 EDQ scores predicted amount of time spent exercising. Overall, these results show explicit attitude processing can uniquely predict exercise behaviors and attitudes.

However, despite the utility of this research, past studies have relied on participant self-reports of exercise, which are often affected by social demand characteristics of the experimental setting, recall bias, and misunderstanding of how to properly classify physical activity. Hence, this study aimed to improve upon previous methodology by using ActiGraph bands (small activity trackers worn on the wrist) to objectively measure actual activity for seven days. Overall, the aim of this research is to determine what personality traits from the NEO-5 Factor Model predicted objectively measured exercise levels and both explicit and implicit attitudes towards exercise. In addition, the extent to which both implicit and explicit attitudes predicted the objectively measured exercise was also examined.

Similar to previous research (Butkovic et al., 2017; Courneya et al.,1998; Forrest et al., 2016; Berry et al., 2013; Berry et al., 2016; Wilson et al., 2015), I hypothesized that participants

who score higher on levels of openness, extraversion, and conscientiousness on the NEO would have higher intensities and durations of objectively measured exercise. In addition, I hypothesized that participants who score higher on these same traits would report/demonstrate more positive explicit attitudes of exercise, while high levels of neuroticism may be linked with less positive attitudes toward exercise. Lastly, I hypothesized that participants who had more positive implicit and explicit attitudes about exercise would engage in more intense and longer durations of exercise and have higher levels of extraversion and openness in comparison to those who have more negative implicit and explicit attitudes towards exercise.

Methods

Participants

Overall, 40 participants were recruited to participate in the study. However, 5 were excluded from analyses due to not passing wear time validation from the ActiGraph band. The sample consisted of younger adults (24 women, 11 men, M_{age}=20.06 years, age range: (18-22) who were undergraduate students at Albright College, a private liberal arts college in Reading, PA, recruited via SONA research system. Other Albright College undergraduate participants were recruited via email and social media platforms during the Winter Interim 2018 period. Participants from the undergraduate Psychology department were compensated with extra credit. Participants during the Winter 2018 Interim period were compensated $10. The sample was comprised of 80% Caucasian, 2.9% Asian, 17.1% African American, and 2.9% Native Hawaiian or other Pacific Islander.

Measures

Personality Traits. The NEO-PI-3 was used to assess the personality constructs of interest. The NEO-PI-3 is a 240 factor personality inventory questionnaire developed from the Big 5 Factor

Model of Personality Psychology (conscientiousness, agreeableness, neuroticism, openness, extraversion). The NEO-PI-3 accesses personality traits based on the numerical degree to which agreed or disagreed to a particular statement (SD- strongly disagree, D-disagree, N- neutral, A-agree, SA- strongly agree).

Implicit attitudes. This construct was measured with an Exercise Implicit Association Task (IAT) borrowed from the Boston University Psychology Department. The IAT was chosen because it can easily examine automatic attitudes towards the single target of interest (exercise) without directly needing a contrast category. In this task, participants were asked to categorize words that belong to a specific category by hitting the 1 or 9 key as fast as they can. Three types of words were presented on the computer screen, positive valence (e.g. excitement), negative valence (e.g., loss), and physical activity (main category of interest), (e.g. running; see Appendix A for full list of words). One block of word presentations asked participants to quickly classify the words as Good OR Bad/Physical Activity. A second block of word presentations asked participants to classify the same words; however, categories appeared as Good/Physical Activity OR Bad. Order in which physical activity was paired with good vs. bad was randomly counterbalanced between subjects to avoid practice/ordering effects. Reaction times for classification were used as the main outcome for this task. Participants were asked to respond to each trial with their initial thoughts and press the 1 key if they thought a trail word belonged to the category on the left and the 9 key if they believed a trial word belonged to the category on the right.

Explicit attitudes. To assess participants' explicit attitudes towards exercise the Multidimensional Outcome Expectations for Exercise Scale (MOEES) was used. The MOEES is a 23-item measure used access participants' explicit attitudes, or beliefs about/expectations

surrounding physical activity. The MOESS has 4 different subscales it: 1) physical health benefits/expectations, 2) social benefits/expectations, 3) mental health benefits/expectations, and 4) negative outcomes/expectations. The physical health benefits/expectations subscale assesses individuals' belief that exercise will result in positive physical health outcomes. (e.g. Exercise would increase muscle strength). The social benefits/expectations subscale assesses individuals' explicit belief that engaging in exercise will result in improved social status and social experiences (e.g. Exercise would provide companionship; Exercise would increase my acceptance by others). In addition, the mental health benefits/expectations subscale assesses individuals' explicit belief that engaging in exercise will result in improved mental health and mood (e.g. Exercise would increase my mental alertness; Exercise would help manage stress). Lastly, the negative outcomes/expectations sub-category assesses individuals' explicit belief that exercise result in negative experiences and outcomes (e.g. Exercise would be embarrassing, Exercise would make me sore). To access these explicit attitudes on the MOEES, participants were asked to respond to each exercise attitude related statement by answering to what extent they agreed or disagreed to each (1-strongly disagree, 2-disagree, 3-neutral, 4-agree, 5-stronlgy agree).

Objectively Measured Exercise Levels. This construct was measured through the use of ActiGraph Bands and their corresponding ActiLife+ software over a week-long period. ActiGraph Bands are similar to popular activity and sleep trackers such as the FitBit and the Apple Watch, but have greater accuracy and do not provide the participant with any direct feedback regarding his/her activity. Participants were explicitly instructed to go about their normal activities while wearing the monitor rather than encouraged to change their activity levels in any way (i.e., we simply wanted to monitor their activity rather than ask them to increase or

decrease). At the conclusion of the 7th day, participants returned the ActiGraph band and their data was downloaded.

Procedure

After completing informed consent, participants used SurveyMonkey, an electronic data collection program to complete the study questionnaires described above. Upon completion of the Exercise IAT, participants' height and weight were measured to compute BMI. This and other demographic information was used to program the ActiGraph device. Instructions for wearing and maintaining the device were then provided to the participant. All participants were instructed to wear the device throughout the following week with the exception of water-activities such as swimming or bathing. Our demographics questionnaire included an item inquiring about anticipated water sports over the monitoring week; however, none were noted. Participants were thanked for completing part 1 of the study and scheduled visit 2 for one week later.

When participants brought back the ActiGraph band a week later, the data was downloaded. Then, participants were given a debriefing form that addressed the purpose of the study, past research, and how to obtain their results if they desired. Lastly, all questions were answered and participants were provided the appropriate extra credit or monetary compensation.

Results

Objectively Measured Exercise Levels

The variable of objectively measured exercise was calculated as a total percent time in moderate or greater intensity exercise (See *Table 1*) as measured by the ActiGraph band. For the variable of objectively measured exercise levels, I anticipated that participants who scored higher on levels of openness, extraversion, and conscientiousness would have higher intensities and

durations of objectively measured exercise. This hypothesis was examined using a Forward Stepwise Hierarchical Regression**.** The first step controlled for demographic variables associated with exercise behavior (BMI, gender, age, race). On the second step, each of the NEO-5 Factor Scores, were added. Results revealed a significant effect of agreeableness on percent of time spent exercising over the week of monitoring, $\beta=-0.4$, $t(35)=-2.15$, $p<0.05$, such that greater levels of agreeableness were associated with less overall exercise. Of the remaining four traits from the NEO-PI-3, none revealed significant associations between trait and overall physical activity levels (See *Table 2)*, nor were any of the demographic characteristics entered at step one significant. Therefore, the above hypothesis was not statistically supported, as only an un-hypothesized trait –agreeableness—emerged as a significant predictor of overall exercise levels in a negative direction.

To examine the association between exercise IAT response times and objectively measured exercise levels, another Forward Stepwise Hierarchical Regression was used. Similar to the previous model, objectively measured exercise was operationalized total percent time in moderate or greater intensity exercise, and demographic variables were entered on step one. Contrary to hypotheses, results demonstrated that there was no significant association between exercise IAT response times and objectively measured exercise levels, $\beta=0.21$, $t(35)=1.23$, *ns.*

An additional regression was run to examine the association between MOOES scores and objectively measured exercise levels. Again, objectively measured exercise was operationalized as total percent time in moderate or greater intensity exercise, demographics were entered on the first stem, and the four MOEE subscales were entered simultaneously on the second step. Results demonstrated that MOEES positive sub-scales scores (physical health benefits/outcomes, social benefits/outcomes, and mental health benefits) did not emerge as significant predictors of

objectively measured exercise levels. (*See Table* 3). This finding is different than my hypothesis that participants who had more positive explicit attitudes would engage in more intense and longer durations of exercise. However, negative MOESS sub-scale scores emerged as a significant predictor of objectively measured exercise levels, $\beta=-0.48$, $t(35)=-2.70$, $p<0.05$ such that higher negative sub-scale scores were associated with less overall exercise.

Implicit Exercise Attitudes

The variable of implicit exercise attitudes was measured using the Exercise IAT and the reaction time (ms) participants had to each exercise, good, and bad targeted/framed word. I hypothesized that participants who scored high in neuroticism would have less positive implicit attitudes towards exercise. Again using a similar Forward Stepwise Hierarchical Regression, controlling for demographic characteristics on the first step, results demonstrated that none of the NEO-5 Factor Traits emerged as significant predictors of implicit attitudes towards exercise. Therefore, the guiding hypotheses about the nature of association between specific NEO-5 Factor Traits and implicit attitudes towards exercise were not statistically supported (*See Table 4*).

Explicit Exercise Attitudes

The variable of explicit exercise attitudes was measured using the MOEES. I hypothesized that participants who scored higher on openness, extraversion, and conscientiousness would report/demonstrate more positive explicit attitudes of exercise, while high neuroticism would be linked with less positive attitudes toward exercise. Once again, a Forward Stepwise Hierarchical Regressions was used to examine the effects of NEO- Factor Traits as predictors of each of the MOEES subscales (physical benefits/expectations, social benefits/expectations, and mental health benefits/expectations) while controlling for

demographic variables on step one. Results demonstrated that conscientiousness emerged as a trend level predictor of individuals' beliefs about the mental health benefits of exercise, $\beta=0.4$, $t(35)= 2.05$, $p=.05$, such that higher levels of conscientiousness were associated with greater belief that exercise has mental health benefits. Like conscientiousness, openness also emerged as a trend level predictor of individuals' beliefs about the mental health benefits of exercise, $\beta=0.39$, $t(35)=2.05$, $p=.05$, such that higher levels of openness were associated with greater belief that exercise has mental health benefits. These results demonstrate support for the current study's hypotheses about the positive nature of conscientiousness and openness levels on explicit exercise attitudes. Unfortunately, the hypothesis of higher levels of extraversion being associated with positive explicit attitudes towards exercise was not statistically supported for any MOESS Sub-Scale.

Furthermore, results demonstrated that neuroticism significantly predicts negative explicit attitudes towards exercise, $\beta=0.50$, $t(35)=2.53$, $p<.05$, such that higher levels of neuroticism were associated with increased beliefs in exercising being unpleasant/negative. This provided support for my hypothesis that neuroticism would emerge as a significant predictor of negative explicit attitudes towards exercise. The same result was not significantly supported for our hypothesis of lower levels of conscientiousness being associated with less positive explicit exercise attitudes ($\beta=-.21$, $t(35)=-1.09$, *ns*).

Discussion

The purpose of the current study was to explore the predictive nature and associations between personality traits from the NEO-5 Factor Model, objectively measured exercise levels, and implicit and explicit exercise attitudes. Although previous research has explored these associations, this particular study aimed to address a literature gap by using actigraphy to

objectively measure exercise levels, unlike past research has relied on self-report measures of exercise. Results revealed negative explicit attitudes were associated with less exercise, while implicit associations did not predict exercise behavior. Additionally, results demonstrated that of the Big 5 personality traits, only agreeableness was associated with objectively measured exercise levels such that greater agreeableness predicted less physical activity. Big 5 personality traits were also predictors of explicit attitudes toward exercise such that higher levels of conscientiousness and openness to experience predicted stronger belief in the mental health benefits of exercise while neuroticism was associated with more negative attitudes toward exercise.

Past research has demonstrated that higher levels of certain traits such as conscientiousness, extraversion, and openness were related to increased levels of exercise and exercise dependence (Butcovik et al., 2017; Wilson et al., 2015; Courneya et al., 1998 & Forrest et al., 2016). However, the current study differs in that regard as none of these previously identified traits emerged as significant predictors of exercise. On the other hand, like past research, the current study found an association between agreeableness and less exercise behavior (Butcovik et al., 2017; Wilson et al., 2015; Courneya et al., 1998 & Forrest et al., 2016). There are a few different reasons why the present study was not consistent with regard to conscientiousness, extraversion, and openness. First, past studies had much larger samples. For example, both Forrest et al. (2016) and Mottus et al. (2017) had over 200 undergraduate students in their research samples. As effect sizes in these studies were in the small to moderate range, it is possible the current study did not have sufficient power to detect differences. Additionally, past studies (Forrest et al., 2016; Mottus et al., 2017; Courneya et al., 1998) used self-report measures to assess exercise behavior and employed different methods for categorizing

"exercise." For example, Mottus et al. (2017), simply asked participants how much time they spent exercising each day, in addition to how much they walked or cycled. The current study differs as self-report measurement of physical activity was not used and the ActiGraph band systematically categorizes exercise levels and intensities, rather than relying on participant recall and perception of the activity. However, the particular result of agreeableness emerging as a negative predictor of exercise behavior is not surprising as past research has observed the same finding (Wilson et al., 2015). Wilson et al. (2015) believes that higher levels of agreeableness predict less exercise considering the nature of increased agreeableness causing individuals to 'cave' or 'give-in' to others and themselves. Meaning, when exercise becomes difficult or is already difficult for individuals high in agreeableness, they are more likely to just submit to their cognitions and behaviors to allow exercise avoidance to occur.

Moreover, previous investigations of implicit attitudes towards exercise have found associations between this construct and specific NEO-5 Factor Traits such as openness, conscientiousness, extraversion, and neuroticism (Berry et al., 2013, 2016; Butcovik et al., 2017; Wilson, 2015). However, in the current study no association was found between any of the NEO-5 Factor Traits and implicit exercised attitudes when measured by the exercise IAT. It should be noted that these previous studies using exercise IAT have not completely agreed on which personality traits from the NEO-5 Factor Model were associated with implicit attitude scores (Berry et al., 2013, 2016; Butcovik et al., 2017; Wilson, 2015). Thus, future studies are needed to clarify the extent to which personality traits predict implicit attitudes about exercise.

Past research on explicit attitudes towards exercise found that NEO-5 Factor Traits and explicit attitudes may be predictors of BMI and development of certain exercise based feelings and behaviors (Butcovik et al., 2017; Wilson et al., 2015; Courneya et al., 1998 & Forrest).

Therefore, these studies formed our hypotheses surrounding explicit exercise attitude, such that participants with higher levels of openness, extraversion, and conscientiousness would report more positive explicit attitudes towards exercise, while participants who score high in neuroticism and conscientiousness will have less positive explicit attitudes towards exercise. Consistent with these hypotheses, higher neuroticism scores predicted more negative expectations of exercise. In general, neuroticism is linked to anxiety and other negative health behaviors so to see this particular result emerge is not surprising at all. However, results only demonstrated a trend level association between both conscientiousness and openness predicting beliefs that exercise has mental health benefits, which is a positive affective cognition with no effect of extraversion. Although this is different than our hypotheses, the MOESS used within the current study was helpful in that it assessed attitudes across four different domains, physical outcomes/expectations about exercise, social outcomes/expectations of exercise, and mental health benefits/expectations of exercise as well as a scale examining overall negative beliefs about exercise. Whereas previous studies tended to use measures that simply categorized exercise attitudes into positive and negative domains, the MOEE allowed for more specific examination of participants' explicit attitudes across three distinct positive expectancy domains.

Unlike the current study, previous research has demonstrated a link between implicit attitudes towards exercise and exercise outcomes/behaviors (Forrest et al., 2016; Mottus et al., 2017). In particular, Forrest et al. (2016) observed that implicit attitudes predicted exercise dependence in a college-aged sample. While, exercise dependence is not a variable of interest in the current study, these results shed light on the usefulness of implicit exercise attitudes measured using an exercise IAT, to predict exercise related constructs. Once again, it is possible

that the relatively small sample size of this study prevented detection of effects that would be expected to fall in the small to moderate range.

Moreover, past research has demonstrated a link between explicit exercise attitudes and exercise related constructs (Forrest et al., 2016; Berry et al., 2013, 2016). In particular, Forrest et al. (2016) demonstrated that explicit attitudes towards exercise determined the extent to which college age students had exercise dependence. While this is not a variable of interest in the study, it provides the groundwork to look into the ability of explicit attitudes to predict exercise outcomes. As stated earlier, the current study aimed to use explicit attitudes to predict objectively measured exercise levels. Results demonstrated the negative explicit attitudes predicted less exercise during the monitoring period. Thus, such negative attitudes about exercise may represent an important target for intervention in those prone to exercise avoidance.

Despite considerable strengths of the current study including objective measurement of physical activity for one week, results must be considered in the context of several limitations. First, the population sample consisted of college undergraduates, which limits the ability to generalize the results of this current study to all age groups. Another limitation was the sample size. Although 40 participants consented and were enrolled in the study, 5 were removed due to not wearing the ActiGraph for a sufficient period of time. Which, limits the power of the current study.

Future investigations would benefit from increased sample size and examination of a broader age range to increase generalizability of the current findings. Considering statistics from the CDC (2012) reporting about 2/3 of Americans meeting overweight or obese criteria and about 50% of Americans reporting not exercising enough to meet minimum recommendations, this line of research provides an important first step in helping healthcare providers to identify at

risk patients for exercise avoidance and obesity. Then from that point, providers can work towards creating and tailoring interventions to at-risk or affected populations.

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Table 1.
Percent of time at each exercise intensity as measured by the ActiGraph band across participants.

Percent of Time at Each Exercise Intensity	*M*	*SD*
Sedentary	*64.67*	*5.65*
Light Intensity	*19.71*	*4.04*
Moderate Intensity	*12.34*	*3.49*
Vigorous Intensity	*1.49*	*1.54*
Very Vigorous Intensity	*0.39*	*0.63*

Table 2.
Statistical results of Forward Stepwise Hierarchical Regression for association between NEO-5 Factor Traits and objectively measured exercise levels.

Trait	Statistical Finding
Openness	*β=-0.303, t(35)=-1.68, ns*
Conscientiousness	*β=-0.18, t(35)=-0.95, ns*
Extraversion	*β=0.3, t(35)=1.51, ns*
Agreeableness	*β=-0.4, t(35)=-2.15, p<.05*
Neuroticism	*β=-0.08, t(35)=-0.4, ns*

Table 3.
Statistical Results of Forward Stepwise Hierarchical Regression for Multidimensional Outcomes Expectations for Exercise Scales (MOOES) scores on 3 different Sub-Scales predicting objectively measured exercise levels.

MOESS Sub-Scale	Statistical Finding
Physical Health Benefits/Outcomes	*β=-0.30, t(35)=-1.39, ns*
Social Benefits/Outcomes	*B=0.26, t(35)=1.36, ns*
Mental Health Benefits/Outcomes	*β=0.07, t(35)=.293, ns*
Negative Outcomes/Expectations	*β=-0.48, t(35)=-2.70, ns*

Table 4.
Statistical results of Forward Stepwise Hierarchical Regression for association between NEO-5 Factor Traits and Implicit Exercise Attitudes as measured by the Exercise Implicit Association Task (IAT).

Trait	Statistical Finding
Openness	*β=-0.43, t(35)=-.204, ns*
Conscientiousness	*β=-0.16, t(35)=-.745, ns*
Extraversion	*β=-0.04, t(35)=-.163, ns*
Agreeableness	*β=-0.17, t(35)=-.795, ns*
Neuroticism	*β=-0.14, t(35)=-.594, ns*

Appendix

Words used in Exercise IAT:

walk	*cozy*	*waste*
jog	*brave*	*weary*
bike	*fireworks*	*deformed*
move	*friendly*	*tragic*
stand	*passion*	*danger*
lift	*desire*	*thief*
carry	*miracle*	*nightmare*
pull	*sunset*	*betray*
stretch	*glee*	*loneliness*
play	*protected*	*gloom*
jump	*bless*	*disgusting*
throw	*excitement*	*inferior*