

2018

Perceived Fitness and Exercise Intensity Can Predict Exercise Enjoyment

Thomas G. Plante

Santa Clara University, tplante@scu.edu

Marilyn Oppezzo

Brendan Tran

L. Aislinn Diaz

Follow this and additional works at: <https://scholarcommons.scu.edu/psych>

 Part of the [Psychology Commons](#)

Recommended Citation

Plante, T. G., Oppezzo, M., Tran, B., & Diaz, L. A. (2018). Perceived Fitness and Exercise Intensity Can Predict Exercise Enjoyment. *Journal of Contemporary Athletics*, 12(1), 61–67.

This is a pre-publication page proofed version. For the final version please refer to the *Journal of Contemporary Athletics*, vol. 12 no. 1 issue.

This Article is brought to you for free and open access by the College of Arts & Sciences at Scholar Commons. It has been accepted for inclusion in Psychology by an authorized administrator of Scholar Commons. For more information, please contact rscroggin@scu.edu.

PERCEIVED FITNESS AND EXERCISE INTENSITY CAN PREDICT EXERCISE ENJOYMENT

*Thomas G. Plante**, *Marilyn Oppizzo*, *Brendan Tran*,
and L. Aislinn Diaz
Santa Clara University, CA, US

ABSTRACT

The goal of the study was to investigate the potential interplay of environmental, physiological, and psychological factors with exercise enjoyment. Eighty female undergraduate students at a private, West Coast university participated in the study. Participants were randomly assigned to one of three experimental conditions: control (C), in which the participant exercised alone; talking (T), in which the participant exercised with two confederates who provided “small talk” conversation; and no talking (NT), in which the participant was told she/he had been randomly selected not to wear headphones while the two confederates would wear them. Although experimental group assignment was unrelated to exercise enjoyment, we found that perceived fitness and average speed predicted 27.6% of the variance in exercise session enjoyment and that perceived fitness significantly predicted enjoyment as did mean speed. Neither condition nor perceived exertion were significant predictors of enjoyment. Because exercise enjoyment is a predictor of exercise program adherence, perceived fitness and actual effort during an exercise session should be further explored.

Keywords: Exercise, enjoyment, perceived fitness, exercise effort

INTRODUCTION

Physical exercise yields a myriad of psychological benefits. It has been associated with a number of positive effects including mood enhancement [1], improved self-evaluation [2], improved visual-spatial memory and increased positive affect [3], and increased creativity [4]. Though the impressive benefits of exercise are well-established, about 80% of Americans over the age of 18 do not meet the Physical Activity Guidelines set by the Center for Disease Control [5].

While there are many reasons why people are not exercising as much as they should, researchers have found that enjoyment of exercise is a strong predictor of exercise program

* Corresponding Author Email: tplante@scu.edu.

adherence [6]. Enjoyment facilitates continued involvement in the exercise activity, countering stress and promoting positive psychological health [6]. The mechanisms linking enjoyment and exercise adherence are likely a diverse confluence of environmental, physiological, and psychological factors [7]. Enjoyment factors such as the music used in the exercise environment, satisfaction with the exercise instructor, and salience of exercise role are shown to be important factors in determining adherence to exercise [8].

Environmental factors can influence the enjoyment one derives from an exercise session. Variations such as location, decor, and social composition can all moderate the subjective experience of exercise. For example, exercising with other people has been shown to increase enjoyment of exercise [9, 10]. In one study, engaging in social exercise, defined as merely completing an exercise workout in the presence of another doing the same activity, augmented the stress-reducing benefits of exercise by increasing calmness when compared with exercising alone [9]. In the same study, social exercise also resulted in a higher degree of tiredness than when exercising alone. Another study also found that environments that have peers who place emphasis on cooperation, effort, and personal involvement increases their self-determination and enjoyment during exercise [11].

Physiological factors, such as actual effort or intensity of an exercise session, may also influence exercise enjoyment, though the research on this shows mixed results. One hypothesized the relationship between physiological factors and exercise enjoyment as an inverted-U curve [1, 12], where minimal or excessive exercise does not produce any effect, only moderate amounts of exercise can produce results. However, Ekkekakis and Petruzzello [13] found a paucity of empirical evidence for this assumption. On the other hand, Reed and Ones [14] meta-analysis found that acute aerobic exercise increased positive feelings for low to moderate exercise doses only. Another study found that fit individuals who select their own exercise intensity will have more psychosocial affect and exercise enjoyment compared to fit individuals who do not select their own regimen [15].

Psychological factors also play a role in exercise enjoyment. While related to actual effort, perceived physical effort is separable. For example, a meta-analysis by Doherty and Smith [16] showed that caffeine reduces perceived exertion, but improves exercise performance. A study of 187 college females found that conscientious individuals experience enjoyment during exercise because they know better adapting coping mechanisms to stressful events such as problem-focused coping and positive reappraisal [17]. However, the same study found that individuals who were more neurotic experienced less enjoyment during exercise because they may have overreacted to minor stressors associated with exercise [17]. Individuals who were engaged in their goals, felt competent to achieve their goals, and liked to examine their progress also enjoyed exercising more [17].

The goal of the study was to investigate if an interplay of environmental, physiological, and psychological factors could potentially influence exercise enjoyment. The environmental factors were the independent variables of the study: exercising with people engaging in conversation, with people listening to headphones, or alone. We predicted that environmental conditions would influence exercise enjoyment. Participants who were in the presence of and conversing with others would likely enjoy exercising more compared to participants who were exercising alone or in the presence of others who were listening to music. The physiological factor assessed was the actual physical effort exerted by the participants and this was measured by the average bike rotations per minute (RPM). We predicted that the actual physical effort would have no consistent relationship with exercise enjoyment. The

psychological factors were the participant's perceived exertion during the exercise session and their self-perception of fitness. We predicted that perceived exertion would have a negative relationship to exercise enjoyment; however, if they had a better self-perception of fitness, then they would likely have a positive relationship to exercise enjoyment.

METHODS

Participants

Eighty female undergraduate students at a private, West Coast university participated in the study (Mean age = 19.0, *SD* = 1.0). The participants received research credit for an introductory psychology course. This study met ethical guidelines and requirements approved by the university's institutional review board (IRB).

Procedures and Design

The current experiment was advertised as an exercise study among a list of other psychology studies as part of an undergraduate survey course requirement. Once enrolled, participants were notified that the study involved a brief exercise session and were advised to wear comfortable exercise clothing. A research assistant escorted the participant into the laboratory where they would be exercising on a stationary bike facing a large mirror.

Participants were randomly assigned to one of three experimental conditions: control (C), in which the participant exercised alone; talking (T), in which the participant exercised with two confederates who provided "small talk" conversation; and no talking (NT), in which the participant was told she/he had been randomly selected not to wear headphones while the two confederates would wear them. In both experimental conditions, the participant and two confederates were instructed to draw from a hat to receive a seat and headphone assignment. Unbeknownst to the participant, all slips in the hat read "No Headphones, #2." This placed the participant on the middle stationary bike out of the three. Upon drawing, the confederates informed the researcher that they had drawn "Headphones, #1" and "Headphones, #3," placing them on the two outside bikes.

Participants then read and signed consent forms and were reminded of their right to decline participation. They completed the Paces Activity Enjoyment Scale (PACES, 18), which measures exercise enjoyment, and the Perceived Fitness Scale (PPFS, 19), which measures beliefs about personal physical fitness. Participants were then told they would be exercising on a stationary bike at a moderate pace for 20 minutes. Every five minutes, participants' bike speeds were recorded. After the exercise session, they immediately completed the Borg Rating Scale of Perceived Exertion. Participants were then given the option to sign an email list to be debriefed about the purpose of the study when it was completed.

Measures

Perceived Enjoyment: Paces Activity Enjoyment Scale (PACES, 18): The PACES scale includes 18 bipolar items on which individuals rate themselves on a 7 point Likert scale. The scale measures the amount of enjoyment individuals perceive themselves to have experienced during an exercise activity. Sample scale items include “I find it energizing/I find it tiring” and “I enjoy it/I hate it.” The author reports that PACES has excellent internal consistency, stability and validity.

Perceived Fitness: The Perceived Physical Fitness Scale (PPFS; 19) is composed of 12 questions which ask participants to rate various aspects of their perceived fitness on a scale of 1-4. A question asking participants to rate their fitness on a scale of 1-10 with 1 indicating a poor fitness level and 10 indicating an excellent fitness level was also included. The PPFS is a valid and reliable instrument to measure an individual’s perception of his physical fitness. (PPFS; Abadie, 1988).

Perceived Exertion: The Borg Ratings of Perceived Exertion is based on a 14-point scale (6 = no exertion, 20 = maximal exertion). This measurement requires a participant to rate his or her level of exercise exertion after completion of the exercise period. Several studies have assessed the Borg RPE and found it to be reliable, valid, and easy to administer and complete [20, 21, 22].

Exercise Exertion: Participants’ exertion was measured by their bike speed (RPM) assessed every 5 minutes. These four speed ratings were averaged to indicate average exertion level.

RESULTS

An analysis of variance (ANOVA) of environmental condition (alone, with others, and with others using headphones), our only treatment variable, on exercise enjoyment was non-significant [$F(2,77) = 0.76, p > .05$]. To test if there was an effect of social presence at all, we combined both social conditions (with others and with others using headphones) and compared them to the alone condition. Again, the ANOVA was non-significant [$F(1,78) = 0.08, p > .05$].

Condition and the remaining factors of interest were tested using multiple regression analysis; condition, mean RPM bike speed, perceived exertion, and perceived fitness were regressed on enjoyment of exercise session in a stepwise linear regression model. The results of the regression indicated perceived fitness and average speed predicted 27.6% of the variance in exercise session enjoyment [$R^2 = 0.28, F(2,65) = 12.41, p < .001$]. Perceived fitness significantly predicted enjoyment (standardized $B = 0.34, p < .01$) as did mean speed (standardized $B = 0.31, p < .01$). Neither condition nor perceived exertion were significant predictors.

To further investigate the relationships, bivariate correlations were conducted. Mean speed was not correlated with perceived exertion ($r = -0.17, p > .05$), therefore one’s pedal speed did not correlate with higher or lower perceived effort. Perceived fitness was significantly negatively correlated with perceived exertion ($r = -0.40, p < .01$); the more fit one perceived themselves to be, the less difficult the workout was perceived. Finally, perceived fitness was correlated with mean speed ($r = 0.28, p < .05$).

DISCUSSION

Our findings demonstrated that a higher average pedal speed, a proxy of actual effort, during the workout and a higher level of perceived fitness before the workout were associated with a higher level of derived enjoyment from the workout. Data further indicated that higher levels of perceived fitness were correlated with lower levels of perceived exertion, but the latter, surprisingly, did not predict enjoyment derived from the exercise session. Because exercise enjoyment is a predictor of exercise program adherence, perceived fitness and actual effort during an exercise session should be explored.

It is feasible that perceptions of physical fitness exert a positive influence on physical activity, and thus subsequently influences actual physical fitness [23]. By this conceptual framework, perceived fitness is a driver of actual physical fitness, rather than a proxy. The current findings contribute to this explanation, as perceived fitness correlated with enjoyment derived from the exercise session; therefore, the more fit one perceives oneself to be, the more they may enjoy their exercise session, and therefore the more likely they will continue exercising.

An alternative explanation for this could be that perceived fitness is a proxy for actual fitness, and that the fitter individuals enjoyed the exercise session more because they were more fit to begin with. The research on the relationship between perceived fitness and actual fitness is mixed. A meta-analysis of 53 studies found a medium effect size of a relationship between the two [24]. One interpretation is that people's assessments of their own fitness are accurate perceptions of their abilities. However, physical fitness is a broad concept, and each participant therefore has license to define what constitutes fitness when answering the research questions. Answering a question about perceived physical fitness does not necessarily indicate the participant had his/her VO₂ max, an objective measure of aerobic capacity, in mind, nor that he / she knew the objective value in the first place. A more likely interpretation is that while perceived fitness and actual fitness are related, they are not measuring the same construct. For example, one study found that perceived fitness was associated with more positive personality and mood variables than actual estimated aerobic fitness levels (VO₂ max), indicating these measures are indeed separable [25]. Future research should include both perceived and actual fitness measures to further investigate the influence of these variables on exercise enjoyment.

Our first hypothesis, that exercise condition would influence subsequent enjoyment, was not supported. Given that past studies have found exercise partners and group exercise to be correlated with enjoyment [9, 10], we were surprised our results did not predict this. One possibility is that because the "others" were confederates, not the participant's friends or chosen partners, there was no effect on how the participant felt about the session. Future studies should test this in more ecologically valid settings, such as a gym with less predictable neighboring exercisers.

There are several limitations to our research that make generalizing our results to a border population difficult. First, the study had a small sample size of only 80 participants so it is difficult to generalize our results. Our participant pool was also homogenous as it only had healthy college students. Our experiment was also conducted in a laboratory setting which may be different from a traditional fitness club or a commercial gym. Accounting these limitations in further research will enhance the findings of this study.

Table 1. Correlation Matrix for Study Variables

	Environmental Condition	Perceived Exertion (Borg)	Perceived Fitness (PPFS)	Enjoy
1. Environmental Condition				
2. Perceived Exertion (Borg)	-.004			
3. Perceived Fitness (PPFS)	-.133	-.261*		
4. Enjoy	.035	-.267*	.059	
5. RPM Mean	.260	-.169	.071	.396**

*p < .05, ** p < .01.

REFERENCES

- [1] Berger, B. G., & Motl, R. W. Exercise and mood: A selective review and synthesis of research employing the Profile of Mood States. *J Appl Sport Psych* 2000, *12*, 69-92.
- [2] Plante, T. G., Gores, C., Brecht, C., Carrow, J., Imbs, A., & Willemsen, E. Does exercise environment enhance the psychological benefits of exercise for women? *Int J Stress Man* 2007, *14*, 88-98.
- [3] Stroth, S., Hille, K., Spitzer, M., & Reinhardt, R. Aerobic endurance exercise benefits memory and affect in young adults. *Neuropsych Rehab* n.d., 223-243.
- [4] Opezzo, M. A., & Schwartz, D. L. Give your ideas some legs: The positive effect of walking on creative thinking. *J Exper Psych: Learn, Mem, and Cogn.* 2014, Doi: 10.1037/a0036577.
- [5] Centers for Disease Control and Prevention. Exercise or Physical Activity Retrieved May 14, 2015, from <http://www.cdc.gov/nchs/fastats/exercise.htm>.
- [6] Wankel, L. The importance of enjoyment to adherence and psychological benefits from physical activity. *Inter J Sport Psych* 1993, *24*, 151-169. Retrieved from Ebsco Host.
- [7] Kimiecik, J., & Harris, A. What Is Enjoyment? A Conceptual/Definitional Analysis with Implications for Sport and Exercise Psychology. *J Sport & Exer Psych* 1996, *18*, 247-263.
- [8] Wininger, S., & Pargman, D. Assessment of Factors Associated with Exercise Enjoyment. *J Music Ther* 2003, *40*, 57-73.
- [9] Plante T. G., Bogdan R., Kanani Z., Ferlic E., Babula M., & MacAskill E. Psychological benefits of exercising with another. *J Human Move Stud* 2003, *44*, 93-106.
- [10] Plante T. G., Coscarelli L., & Ford, M. Does exercising with another enhance the stress-reducing benefits of exercise? *Inter J Stress Manag* 2001, *8*, 201-213.
- [11] Murcia, J., San Roman, M., Galindo, C., Alonso, N., & Gonzalez-Cutre, D. Peers' influence on exercise enjoyment: A self-determination theory approach. *J Sports Sci and Med* 2008, *7*, 23-31.
- [12] Ojanen, M. Can the true effects of exercise on psychological variables be separated from placebo effects? *Inter J Sport Psych* 1994, *25*, 63-80.
- [13] Ekkekakis, P., & Petruzzello, S. Acute aerobic exercise and affect: Current status, problems, and prospects regarding dose-response. *Sports Med* 1999, *28*, 337-374.

- [14] Reed, J., & Ones, D. The effect of acute aerobic exercise on positive activated affect: A meta-analysis. *Psych Sport and Exer* 2006, 477-514.
- [15] Parfitt, G., Rose, E., & Markland, D. The Effect of Prescribed and Preferred Intensity Exercise on Psychological Affect and the Influence of Baseline Measures of Affect. *J Health Psych* 2000, 5, 231-240.
- [16] Doherty, M., & Smith, P. Effects of caffeine ingestion on rating of perceived exertion during and after exercise: A meta-analysis. *Scandinavian Journal of Medicine and Science in Sports Scand J Med Sci Sports* 2005, 15, 69-78. doi:10.1111/j.1600-0838.2005.00445.x
- [17] Lochbaum, M., & Lutz, R. Exercise Enjoyment and Psychological Response to Acute Exercise: The Role of Personality and Goal Cognitions. *Ind Diff Res* 2005, 3, 153-160.
- [18] Kendzierski, D., & Decarlo, K. Physical Activity Enjoyment Scale: Two validation studies. *PsycTESTS Dataset* 1991, 13, 50-64.
- [19] Abadie, B. Construction and validation of a perceived physical fitness scale. *Perc and Motor Skills* 1988, 67, 887-892.
- [20] Borg, E. E., & Kaijser, L. L. A comparison between three rating scales for perceived exertion and two different work tests. *Scand J Med & Sci Sports* 2006, 16, 57-69. doi:10.1111/j.1600-0838.2005.00448.x.
- [21] Centers for Disease Control and Prevention. How much physical activity do adults need? In *Physical Activity for Everyone* 2011. Retrieved February 4, 2012, from <http://www.cdc.gov/physicalactivity/everyone/guidelines/adults.html>.
- [22] Germain, J., & Hausenblas, H. The Relationship between Perceived and Actual Physical Fitness: A Meta-Analysis. *J Appl Sport Psych* 2006, 18, 283-296.
- [23] Plante, T., Lantis, A., & Checa, G. The Influence of Perceived Versus Aerobic Fitness on Psychological Health and Physiological Stress Responsivity. *Inter J Stress Manag* 1998, 5, 141-156.
- [24] Robertson, R. J., Goss, F. L., & Metz, K. F. Perception of physical exertion during dynamic exercise: A tribute to Professor Gunnar AV Borg. *Perc and Motor Skills* 1998, 86, 183-191.
- [25] Sonstroem, R. Physical self-concept: Assessment and external validity. *Exer and Sport Sci Rev* 1998, 26, 133-164.