Research Paper

Relationship between Leisure-Time Physical Activity and Discrepancies of the Self among college students in India

Vaishnavi. K. M.[1]*, Kanchana. M.[2]

ABSTRACT

Routine physical activity has been shown to have a substantial impact on both physical and mental health. As an exploration of the psychological aspects of exercise and sports, the present study attempts to investigate the relationship between Leisure-time Physical Activity and Self-discrepancies. The self-discrepancies were measured with respect to the Big-Five Personality traits, by getting self-reports of Actual and Ideal selves. The Godin-Shephard Leisure-Time Physical Activity Questionnaire (GSLTPAQ) and the Mini-IPIP scales were used to collect data from college students (N=166) in India, who belong to the streams of Art, Science, Commerce, and Social Work. The data obtained suggest that the amount of physical activity is significantly correlated with self-discrepancies in Neuroticism (r = -0.27) and Extraversion (r = -0.17). A significant negative relationship was also observed between Physical Activity and the Total Self-Discrepancy. The conclusion arrived at was that Physical Activity affects some aspects of our personality traits and that individuals who perform sufficient amount of physical activity on a regular basis are more likely to actualize selected aspects of their idealistic selves.

Keywords: *Physical Activity, Self-discrepancy, Personality Traits, Actual Self, Ideal Self*

O ver the past few decades, there has been a substantial increase in the amount of importance given to physical activity. The growing awareness about the benefits of physical exercise and the dangers of sedentary lifestyle has made people inculcate various forms of physical activity into their lifestyles. Regular participation in some form of physical activity has been shown to have a positive impact on body, mind and soul.

Physical activity may be defined as any bodily movement produced by skeletal muscles that requires expenditure of energy. Thus, the definition encompasses all types of physical activity, such as exercise, sports, movement from one place to another or any work-related physical activity (WHO, 2020). In this research, the variable used is 'Leisure-Time Physical Activity'. This can simply be defined as the physical activity people engage in during their freely disposable time. Examples of leisure-time physical activity include sports and exercise, which are performed specifically for the purpose of improving physical fitness (Steinbach &

[1]Student, III B.Sc. Psychology, Women`s Christian College, Chennai, Tamil Nadu, India.
[2]Head of the Psychology Department, Women`s Christian College, Chennai, Tamil Nadu, India.
*Corresponding Author

Graf, 2008). Thus, Leisure-time physical activity is likely to be more volitional and performed at higher intensity (Caspersen, Powell, & Christenson, 1985).

The available research studies on the psychological aspects of physical activity show the importance of physical activity and the positive impact of regular exercise on mental health. It has been established that physical activity has a profoundly positive impact on self-concepts such as self-esteem (Elmagd et al., 2015), self-efficacy, and body image (Ouyang et al., 2020). Moreover, negative affective states like depression, anxiety, and stress seem to be associated with sedentary lifestyles (Dunn et al., 2005). Exercise also lowers the risk of mental disorders, and has been proved to be effective when used as a supplementary treatment method in the case of some psychiatric conditions (Saxena et al., 2009) and alcohol and substance abuse intervention programs. Above all, exercise has been evidenced to be an effective way to improve overall well-being and achieve a higher quality of life. Physical exercise is linked to all key concepts of psychological well-being such as autonomy, positive relations with others, personal growth, purpose in life, environmental mastery, self-acceptance, and self-efficacy (Edwards et al., 2006).

The second variable used in this study, 'Self-Discrepancy' can be well understood by the *self-discrepancy theory* put forth by Tory Higgins (1987). The premise of the *self-discrepancy theory* is that inconsistencies between the different aspects of self-representations result in emotional discomfort. Individuals compare their 'Actual selves' to internalized standards (Ideal self) and the inconsistencies that exist between Actual and Ideal Selves may be termed as Self-discrepancy (APA Dictionary of Psychology, n.d.).

The Actual Self is the representation of personal characteristics that one possesses. On the other hand, representation of personal characteristics that one would ideally like to possess may be termed as Ideal Self.

The concept of self-discrepancy implies that rather than self-concepts such as self-esteem and self-efficacy, the discrepancy between the different self-states are what play a major role in determining emotional vulnerability. The more discrepant one`s different self-states are, the more emotional discomfort experienced by the individual.

The present research measures self-discrepancy along the Big-Five personality dimensions, which is a method employed by Stanley & Burrow (2015). They made use of the Mini-IPIP (Donnellan, Oswald, Baird, & Lucas, 2006), to measure self-discrepancy on the five personality traits, which are Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism. This measurement of self-discrepancy has been employed in the current research as well.

A wide range of literature is available elucidating the connection between exercise behavior and the Big Five personality dimensions, which indicate significant relations between some of the five trait dimensions and physical activity.

Similar to physical activity, there seem to exist relationships between self-discrepancy and measures of self-esteem, self-efficacy (Philippot et al., 2018), anxiety, depression (Solomon-Krakus et al., 2017), and specific affective states such as sadness, joviality, self-assurance, surprise, serenity, guilt, and attentiveness (Barnett et al., 2017). Discrepancies of the different aspects of the self-increase sadness and dejection and therefore decrease the quality of life

(Higgins, 1993). Mahoney and Harnett (1973) suggest that self-actualizing individuals are significantly more likely to have congruence between actual and ideal selves, and to be more accepting of oneself.

Thus, measures of self-discrepancy and exercise behavior have been studied in connection with a few common variables. These include concepts of the self-such as self-esteem, self-efficacy, or even affective states like depression and anxiety. As suggested by Tory Higgins (1987), discrepancies between the different selves seem to have negative emotional consequences, as evidenced by different studies. Considering the multitude and the magnitude of the consequences of individual discrepancies, discovering the factors which are associated with self-congruence may help us lead more satisfying lives and live as self-actualizing individuals. By assessing the relationship between physical activity engagement and self-discrepancy, we would be able to gain a deeper understanding of whether or not being physically active would foster congruency. In addition, we would be able to understand which aspects of our personality are affected by physical activity.

It should be noted that the two concerned variables, 'Leisure-time Physical Activity' and 'Self-discrepancy' are yet to be studied in conjunction and so the current study would be an exploratory attempt to assess the relationship between physical activity and self-discrepancy. However, studies exploring the relationship between physical activity and physical self-discrepancy exist. In one such study, the results seem to indicate a significant relationship between the two variables. It was found that when the actual and ideal self-perceptions were similar to one another, the amount of physical activity engaged in was higher. When physical activity was lower, the ideal or ought physical self-perception was much greater than the actual physical self-perception. The mediating role of motivation was also established (Brunet et al., 2012).

Thus, it can also be said that the current research serves as an extension of existing literature, which attempts to find out if physical activity is associated with self-discrepancy in one`s personality traits as well. In other words, the research has been conducted for the purpose of finding out whether leisure-time physical exercise helps in achieving one`s idealistic personality characteristics, which would be reflected in the decreased level of discrepancies between one`s ideal self and the real self.

MATERIALS AND METHOD

Objectives
The aim of the study was to learn if leisure-time physical exercise is correlated with lower self-discrepancies, thus fostering self-congruence among college students pursuing their Arts and Science courses in India. Thus, the objectives may be put forth as follows.
- To find if there is a significant relationship between leisure-time physical activity and self-discrepancy in each of the Big-Five Personality Traits.
- To find if there is a significant relationship between leisure-time physical activity and Total self-discrepancy in Personality traits.

Variables
A correlational study was carried out with the variables physical activity, self-discrepancies in each of the five personality dimensions, and total self-discrepancy. On the whole, the study included 7 variables.
- Leisure-time Physical Activity

- Self-discrepancy in Openness
- Self-discrepancy in Consciousness
- Self-discrepancy in Extraversion
- Self-discrepancy in Agreeableness
- Self-discrepancy in Neuroticism
- Total Self-discrepancy

Hypotheses

It was hypothesized that

- There will be no significant relationship between the amount of Leisure-Time physical activity and the **Total self-discrepancy** in the Big Five personality traits.
- There will be no significant relationship between the amount of Leisure-Time physical activity and self-discrepancy in **Openness.**
- There will be no significant relationship between the amount of Leisure-Time physical activity and self-discrepancy in **Consciousness.**
- There will be no significant relationship between the amount of Leisure-Time physical activity and self-discrepancy in **Extraversion.**
- There will be no significant relationship between the amount of Leisure-Time physical activity and self-discrepancy in **Agreeableness**
- There will be no significant relationship between the amount of Leisure-Time physical activity and self-discrepancy in **Neuroticism.**

Participants

90 females and 76 males participated in this research study, with the total sample constituting 166 college students. Snowball sampling, a type of non-probability sampling was employed in this study. The participants were informed that there would be no known benefits obtained from participation, and that involvement is completely voluntary.

The participants constituted of both undergraduate and postgraduate students, who are pursuing Art and Science courses in India. It should be noted that students of Commerce, Business Management, and Social Work were also included in the sample, since these courses are offered in 'Arts and Science Colleges' in India, in spite of being professional courses. Psychology students were the majority of the participants (50), followed by students of Commerce (25), and English (8). Students from a wide variety of other courses also participated in this research study. The majority of the students were those pursuing their undergraduate degree (160), while 6 out of the 166 participants were those pursuing their Master`s degree.

Students who graduated in 2020 were also included in this study. 107 participants were those in their third year of study, which constitute a majority of the sample. The mean age of participants was 19.87 with a standard deviation of 1.24. Thus, a huge portion of the students were between the ages of 19-21.

Almost half of the students were from Chennai, Tamil Nadu (70). A significant number of responses were also obtained from Bangalore (18), Mumbai (13), Pune (10), and Delhi (9). The total number of cities included in the study is 27.

Out of the total number of responses obtained, 61 responses had to be taken out as they did not meet the inclusion criteria. 3 of those responses did not meet the age criteria; 7 of them did not belong to students of Arts and Science colleges, and 3 of the responses were deleted because they were repeated. 48 responses had to be deleted because of incorrect and/or incomplete responses. The exclusion of 61 responses lead to the number of participants, N=166.

The inclusion and exclusion criteria for the study were as follows:
Inclusion criteria:
- Men and women
- Undergraduate and graduate students between the ages of 18 to 24.
- Students pursuing a course in an Arts and Science college in India.
- Recently graduated students (in 2020).
- People of Indian origin.

Exclusion criteria:
- High school students.
- Working professionals.
- Married individuals.
- People with physical impairments or chronic illness.

Materials
The study made use of two questionnaires.

I. **Godin-Shephard Leisure-Time Physical Activity Questionnaire (GSLTPAQ):** The physical activity variable was measured using the Godin-Shephard Leisure-Time Physical Activity Questionnaire (GSLTPAQ). The questionnaire, which was devised by Godin in 1985, has been described as 'a simple method to assess exercise behavior in the community'. This short and practical questionnaire consists of three open-ended questions, which are used to measure the frequency of strenuous, moderate, and mild exercise that an individual engages in for more than 15 minutes during their free time in one week. The frequencies of strenuous, moderate, and mild exercises are then multiplied with 9, 5, and 3 Metabolic Equivalents (MET) respectively, and the three scores are summed to obtain the total measure of leisure-time physical activity. This score is being used in the current research as a measure of the variable 'Leisure-time Physical Activity'. The two-week test-retest reliability coefficients for self-reports of leisure activity were found to be 0.74. The concurrent validity was determined by using the Pearson product moment correlation between the self-reported leisure-time physical activity and object physical measures. The correlation coefficient with BF percentile was found to be 0.13, significant at the 0.01 level and the correlation coefficient with VO2 max percentile was found to be 0.24, significant at the 0.001 level (Godin & Shephard, 1985).

II. **Mini-IPIP:** The Mini-IPIP, constructed by Donellan, Oswald, Baird, & Lucas (2006) is a short 20-item questionnaire which measures personality traits of an individual along the Big-Five personality dimensions (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism). Each item is scored on a five-point Likert scale, ranging from 'Strongly Agree' to 'Strongly Disagree'. There are 4 items for each of the five personality traits, the mean score of which yields the score for that particular trait dimension. The psychometric properties of this scale have been evidenced across five studies, all of which suggest that the scale has acceptable internal consistencies, the

lowest being a correlational coefficient of 0.60. Study 1 showed that the test-retest reliability measures of the Mini-IPIP are .77, .70, .69, .68, .65 for Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness, respectively. The convergent validity of the Mini-IPIP scale with the IPIP-FFM scale were found to be 0.93, 0.89, 0.90, .92, .85 for the above mentioned Big-five personality traits. Similarly, discriminant and criterion-related validity were also established in the studies that followed (Donnellan et al., 2006). The calculation of the measure of self-discrepancies was done as follows. The scores of items 6, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20 first needed to be reversed. The self-discrepancy is calculated by the following method: the trait scores were first established for each of the five personality traits. This involves calculating the mean score of the four items that encompass the particular trait. For example, the trait score for Neuroticism was calculated by the mean value of the items 4, 9, 14, and 19. The Actual/Ideal discrepancies for each personality dimension were calculated by subtracting the ideal trait scores from the actual trait scores. The Total self-discrepancy was calculated by adding up the Actual/Ideal discrepancies of all five personality traits (Stanley & Burrow, 2015).

Data Collection

The questionnaires, along with the consent form and the instructions were electronically circulated via Google forms. The collection of data was started on September 7, 2020 and it was completed on October 10, 2020.

The consent form was attached at the first, which included information about the title of the study, the overview, components, participation criteria, possible risks, and benefits, and finally, a note on confidentiality.

The second page of the form required the participants to enter certain personal details, to identify the demographic data of the sample. The details included Initials, Age, Gender, City in which they study, Type of Degree (Bachelor`s/Master`s), Stream of Study, Year of Study, and Name of the Institution.

The first questionnaire was the Physical Activity Questionnaire, where participants were required to enter the number of times they perform strenuous, moderate, and mild exercise for more than 15 minutes at a time in a typical week. The amount of physical activity was then calculated by multiplying the numbers by 9, 5, and 3 MET`s respectively, and added up. The total score obtained was then regarded as the measure of physical activity for that particular individual.

The second questionnaire was presented twice: participants were first asked to fill the Mini-IPIP on the basis of their Actual Selves, that is, by describing how they are in the present moment. This gives the Actual Self Scores (α = .61). Then, participants were asked to fill the same questionnaire again, by describing their Ideal Selves, or in other words, how they wish to be in the future. This produces the Ideal Self Scores (α = .81). Each item of the Mini-IPIP was to be given a rating ranging from 1 to 5, with 1 being 'Very Inaccurate' and 5 being 'Very Accurate'.

Thus, Primary data was collected through the questionnaire method and Pearson correlation analysis was used for the data processing and calculation of results. The calculations were carried out in Microsoft Excel.

RESULTS AND DISCUSSION

Table No. 1 Means and Standard Deviations of the Variables

Physical Activity		S-D in Neuroticism		S-D in Extraversion		S-D in Openness	
M	SD	M	SD	M	SD	M	SD
58.22	38.26	0.68	0.75	0.7	0.67	0.5	0.44

S-D in Agreeableness		S-D in Conscientiousness		Total S-D	
M	SD	M	SD	M	SD
0.52	0.56	0.45	0.51	2.86	2.04

Note. S-D = Self-Discrepancy, M = Mean, SD = Standard Deviation

Table No. 2 Physical Activity and Self-Discrepancies in the Big-Five Personality traits

	S-D in Neuroticism	S-D in Extraversion	S-D in Openness	S-D in Agreeableness	S-D in Conscientiousness	Total S-D
Physical Activity	-0.27**	-0.17*	-0.54 NS	-0.1 NS	-0.09 NS	-0.22*

**P<0.001, *P<0.05, NS = not significant
Note. S-D = Self-Discrepancy

Table No. 1 presents the mean and standard deviations of the seven variables which were made use of in this study.

As shown in Table No. 2, the data analysis revealed that out of the big five personality traits, Neuroticism and Extraversion self-discrepancies have significant correlations with leisure-time physical activity.

Further analysis revealed that Self-discrepancy in Neuroticism was found to have a significant negative correlation with physical activity, $r(164) = -.27$, $p < .001$. The findings imply that the higher the physical activity, the lower the discrepancy between an individual`s actual and ideal levels of neuroticism.

Similarly, the Physical Activity variable seems to share a statistically significant relationship with self-discrepancies in Extraversion, $r(164) = -.17$, $p < .05$. An increase in one of the variables seemed to be associated with decrease in the other. In other words, increase in physical activity predicts decrease in incongruence between one`s actual and ideal levels of extraversion.

Self-discrepancy in Openness was not found to be significantly correlated with Leisure-time physical activity ($p = 0.49$). Similarly, the correlational coefficients of Physical Activity with Agreeableness and Conscientiousness were also not statistically significant, with p-values of 0.18 and 0.24 respectively.

Although self-discrepancies in Openness, Agreeableness and Conscientiousness were not statistically correlated with Physical Activity, the Total Self-discrepancy measure was found to share a significant negative relationship with physical activity, $r(164) = -.22$, $p = .004$.
It was hypothesized that there would be no significant relationship between physical activity and total self-discrepancy. In addition, it was also stated that there would not be a significant

relationship between physical activity and self-discrepancies in any of the five personality trait dimensions.

In comparison with the results obtained, the hypotheses of self-discrepancies of Openness, Agreeableness and Conscientiousness have been confirmed and thus can been accepted. On the other hand, the null hypotheses stated for self-discrepancies of Neuroticism and Extraversion and the total self-discrepancy have been rejected.

In a study which attempted to discover the impact of routine exercise on the Big-Five Personality traits, Courneya & Hellsten (1998) reported that the personality trait Neuroticism shares a significant negative relationship with physical activity. Moreover, the personality traits Extraversion and Conscientiousness share a significant positive relationship with exercise behavior.

A meta-analysis study by Rhodes (2007) revealed a similar trend, wherein Neuroticism decreased with increase in physical activity, while Extraversion and Conscientiousness increased with increase in physical activity. These correlations were found to be statistically significant.

The above studies indicate that physical exercise seems to have an impact on the personality traits Neuroticism, Extraversion, and Conscientiousness.

Similar findings have been obtained in the current study, where physical activity has seems to have had an influence on the personality traits Neuroticism and Extraversion. The difference lies in self-discrepancies in Conscientiousness, which does not seem to be affected by the physical activity levels. Thus, the results provide some evidence that physical activity plays a role in individuals achieving their desired personality states, particularly with respect to Neuroticism and Extraversion.

CONCLUSIONS

The current research study has revealed the following findings

- Leisure-time Physical Activity shares a significant relationship with self-discrepancies in Neuroticism and Extraversion.
- There is no significant relationship between exercise behavior and self-discrepancies in Openness, Agreeableness and Conscientiousness.
- The measure of Total Self-discrepancy shares a significant relationship with Leisure-time Physical Activity.

REFERENCES

APA Dictionary of Psychology. (n.d.). *Self-discrepancy.* Retrieved from https://dictionary.apa.org/self-discrepancy

Barnett, M. D., Moore, J. M., & Harp, A. R. (2017). Who we are and how we feel: Self-discrepancy theory and specific affective states. *Personality and Individual Differences, 111*, 232-237. https://doi.org/10.1016/j.paid.2017.02.024

Brunet, J., Sabiston, C., Castonguay, A., Ferguson, L., & Bessette, N. (2012). The association between body-related self-discrepancies and women's physical activity: The mediating role of motivation. *Journal of Sport & Exercise Psychology, 34*(1), 102-123. https://doi.org/10.1123/jsep.34.1.102

Courneya, K. S., & Hellsten, L. M. (1998). Personality correlates of exercise behaviour, motives, barriers and preferences: An application of the five-factor model. *Personality and Individual Differences, 24*(5), 625-633. https://doi.org/10.1016/S0191-8869(97)00231-6

Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The mini-IPIP scales: Tinyyet-effective measures of the Big Five factors of personality. *Psychological Assessment, 18*, 192–203. https://doi.org/10.1037/1040-3590.18.2.192

Dunn, A. L., Trivedi, M. H., Kampert, J. B., Clark, C. G., & Chambliss, H. O. (2005). Exercise Treatment for Depression: Efficacy and Dose Response. *American Journal of Preventive Medicine, 28*(1), 1-8. https://doi.org/10.1016/j.amepre.2004.09.003

Edwards, S. D., Ngcobo, H. S. B., Edwards, D. J., & Palavar, K. (2006). Exploring the relationship between physical activity, psychological well-being and physical self-perception in different exercise groups. *South African Journal for Research in Sport, Physical Education and Recreation, 27*(1), 59-74. https://doi.org/10.4314/sajrs.v27i1.25908

Fernández-Bustos, J. G., Infantes-Paniagua, Á., Cuevas, R., & Contreras, O. R. (2019). Effect of Physical Activity on Self-Concept: Theoretical Model on the Mediation of Body Image and Physical Self-Concept in Adolescents. *Frontiers in psychology*, *10*, 1537. https://doi.org/10.3389/fpsyg.2019.01537

Godin, G., Shephard, R. J. (1985). A simple method to assess exercise behavior in the community. *Can J Appl Sport Sci, 10*(3), 141-146. PMID: 4053261.

Mahoney, J., & Harnett, J. (1973). Self-Actualization and Self-Ideal Discrepancy. *The Journal of Psychology, Interdisciplinary and Applied, 85*(1), 37-42. https://doi.org/10.1080/00223980.1973.9923857

Otto, M., & Smits, J. A. J. (2011). *Exercise for Mood and Anxiety: Proven Strategies for Overcoming Depression and Enhancing Well-Being*. Oxford University Press – Health and Fitness.

Ouyang, Y., Wang, K., Zhang, T., Peng, L., Song, G., & Luo, J. (2020). The Influence of Sports Participation on Body Image, Self-Efficacy, and Self-Esteem in College Students. *Frontiers in psychology*, *10*, 3039. https://doi.org/10.3389/fpsyg.2019.03039

Philippot, P., Dethier, V., Baeyens, C., & Bouvard, M. (2018). Validation of the Self-Discrepancies Scale (S-DS): A tool to investigate the Self in clinical and research settings. *European Review of Applied Psychology, 68* (2). https://doi.org/10.1016/j.erap.2018.04.001

Power, R. A., & Pluess, M. (2015). Heritability estimates of the Big Five personality traits based on common genetic variants. *Translational Psychiatry, 5*(7). https://doi.org/10.1038/tp.2015.96

Rhodes, R. (2007). Personality correlates of physical activity: A review and meta-analysis. *British Journal of Sports Medicine, 40*(12), 958-965. https://doi.org/10.1136/bjsm.2006.028860

Saxena, S., Ommeren, M. V., Tang, K. C., & Armstrong, T. P. (2009). Mental health benefits of physical activity. *Journal of Mental Health 14*(5), 445-451. https://doi.org/10.1080/09638230500270776

Solomon-Krakus, S., Sabiston, C.M., Brunet, J., Castonguay, A. L., Maximova, K., &Henderson, M. (2017). Body Image Self-Discrepancy and Depressive Symptoms Among Early Adolescents. *Journal of Adolescent Health, 60*(1), 38-43. https://doi.org/10.1016/j.jadohealth.2016.08.024

Stanley, M., & Burrow, A. L. (2015). The distance between selves: The influence of self-discrepancy on purpose in life. *Self and Identity, 14*(4), 441–452. https://doi.org/10.1080/15298868.2015.1008564

Steinbach D., Graf C. (2008) Leisure Time Physical Activity and Sedentariness. *In: Kirch W. (eds) Encyclopedia of Public Health. Springer, Dordrecht.* https://doi.org/10.1007/978-1-4020-5614-7_1968

Vartanian, L. R. (2012). Self-Discrepancy Theory and Body Image. *Encyclopedia of Body Image and Human Appearance, 2,* 711-717. https://doi.org/10.1016/B978-0-12-384925-0.00112-7

World Health Organization. (2020, November 26). *Physical Activity.* Retrieved from https://www.who.int/news-room/fact-sheets/detail/physical-activity