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EFFECT OF HIGH INTENSITY INTERVAL TRAINING ON EXTROVERSION OF PHYSICAL EDUCATION STUDENTS

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ABSTRACT

Background:A training that is time-efficientconcept to boost cardio-respiratory health and fitness management psychological factors as high blood pressure is generated by a high-intensity interval training (HIIT) fear and pain. Conversely, students can improve their acceptance of HIIT.

Aim: The study sought to determine the consequence of high-intensity interval training on Extroversion selected Characteristic of Physical Education Students.**Material and Method**: 40 Male and 40 Female students randomly selected from Department of Physical education, Swami Vivekananda Subharti University, Meerut and U.P. The age group of subjects was haphazardly included from 20 to 25 years, and subjects were divided equally into two groups i.e. Experimental (EG) category and Control (CG) category. The experimental group underwent HIIT training for 12 weeks and CG was as usual. Pre and post-test data of Extroversion were collected and a three-way ANCOVA applied, further simple effect was seen to study the significance between control and experimental group.**Result**: The training showed improvement but the effect was not found significant in experimental, both the genders of urban and rural area students. All the students of urban and rural, male and female in control and experimental group were not found better in comparison. The result of the study indicates HIIT did not show significant improvement in

Extroversion as p<0.05. **Conclusion:** The study concluded that HIIT training was not significantly effective on Extroversion.

Keywords: Extroversion, High Intensity, Interval, Physical Education, Students, Training

1. INTRODUCTION

The role of physical workout in physical and mental health improvement is becoming increasingly important. Latest work shows that having exercise as an adjuvant to emotional wellbeing and cardiovascular fitness will improve clinical outcomes.[1,] [2]Growing research often suggests that the brain and exercise can have a detrimental effect on youth outcomes in mental health (e.g. depression and anxiety).[3]Physical exercises contribute to better brain functions, academic ability and executive function.[4]

In sports the word "training" is commonly used. There are notwithstanding few debatable questions amide sports scientist with respect to a word makes perfect sense. Sports medicine is not only affected by certain practitioners, but also by physical exercises that all too frequently take place in preparation such as strength trainings, interval training, tactical and technical training. A systematic course of action stretches over long periods in sport training.[5](HIIT) has arose as an efficacious strategy to bolster young people physical health outcomes.[6,7]HIIT implies either (a) quick or long cycles of high-intensity exercise (e.g. > 85% maximal heart rate) interspersed with short rest periods (< 45 seconds to 2-4 minutes), or (b) short or long (< 10 seconds to 20-30 seconds) intense sprint interspersed with prolonged rest periods between exercises(8). The key benefit of HIIT is that it can be completed in a set time , leading to similar physiological improvements to longer traditional aerobic training sessions.[8]There is conclusive proof that HIIT can enhance physical health and well-being-being.[9]

Emotional stability is not only the avoidance of a mental disorder but a situation of healthy well-being and efficient operation in which a handled his or her ability and can contribute positively to their society.[10]For moderate intensity continuous training, the association about the degree of affective reactions and aerobic exercise is well stated.[11]Based on the foregoing evidence, it can be concluded that more negative affective responses result from exercise sessions that negatively destabilize metabolic homeostasis. Made to give that the affective response can be a predictor of adherence to exercise, it is

important to recommend exercise sessions that lead to greater affective responses.[12] In this sense, although lower intensities are correlated with strong positive psychological responses, it is important to consider,[13]higher intensities are correlated with greater physical gain.[14]The studies exploring the influence of HIIT on psychological and affective responses are fairly widespread and there has been growing research interest in the issue in recent years, Such findings have explored the responses to pleasure in particular.[15-17] Probably because pleasure may also be a conciliator of compliance to exercise.[18] Whereas some highlighted the positive outputs for HIIT enjoyment particularly in comparison to MICT,[18]some have reported disappointing responses.[19] Such conflicting results can be clarified by the variations in protocols between the research findings.[20] The ratio of stimulus to recovery durations may have affected these findings, leading to positive findings seen in the study of Bartlett et al.[21]On the other contrary , some studies denote that interval training has viable associated risks as well as adverse psychological effects, evoking a preventable reaction and retreat. In order to achieve the necessary high intensity level, HIIT also needed the participants' self-discipline and self-regulation.[22]

Despite such divergent outcomes, it is important to know if HIIT training can be successful in terms of its psycho-physiological outcomes without triggering a decrease in affective or enjoyment responses.[23]Despite the fact that everything is not predictable in sports where a person can be geared up for, coaching and make do a team is about improvising; enhance the percentiles. And that's where sports psychology and psychologist holds the responsibility to maximize the percentile. “Essentially, sports psychology contains the study of the psychological factors that greatly affect on outcomes and how participation in physical activity affects the player both physically and cognitively”. In this study, we implemented a reduced term but higher intensity exercise program to assess the maximum participant rate and positive or negative consequences for students’ extroversioncharacteristic. So, the goal of this study was therefore to perform an interpretation of the data extracted from physical education students on the effects of HIIT on extroversion, implying that a person who drives energy through interaction with others.

2. MATERIAL AND METHOD

2.1 Subjects

Total 40 male and 40 female students randomly selected from Department of Physical Education, Swami Vivekananda Subharti University, and U.P. The age range of subjects had been from20 to 25 years. The subjects were obtainedafter seeking their permission for the same.

2.2 Study Design

Pre and post test control group designed was applied. Those participant were split into two equal groups i.e. Control group (CG), Experimental Group (EG) and further urban, rural and male female. The experimental group underwent HIIT training for a period of 12 weeks and CG did not perform any training. The extroversion was measured just before and after the 12 weeks trainings.

2.3 Training Protocol

The HIIT training were a period of 12 weeks and five days continue sessions per weeks conducted. The training sessions were maximum 10 minutes in duration, was conducted at play ground of the concerned University. The below training schedules tables were followed to conduct training.

Table-1: Schedule: Twelve Weeks HIIT Training

The high intensity interval training program performed by physical education students

Weeks	Workout schedule
1	"15:15 × 4 reps × 4 sets 100% MAS = 63.15 m in 15 s, followed by 15 s REST & 2-min rest between sets. Time spend at 100% MAS = 240 s and Session length = 10 mins.
2	20:20 × 3 reps × 3 sets 100% MAS = 84.2 m in 20 s, followed by 20 s REST & 3-min rest between sets. Time spend at 100% MAS = 180 s and Session length = 09 mins.
3	15:15 × 4 reps × 3 sets 110% MAS = 69.46 m in 15 s, followed by 15 s REST & 2-min rest between sets. Time spend at 110% MAS = 180 s and Session length = 07 mins.
4	20:20 × 3 reps × 2 sets 110% MAS = 92.62 m in 20 s, followed by 20 s REST & 3-min rest between sets. Time spend at 110% MAS = 120 s and Session length = 05 mins.
5	15:15 × 6 reps × 2 sets 120% MAS = 75.78 m in 15 s, followed by 15 s REST & 2-min rest between sets. Time spend at 120% MAS = 180 s and Session length = 05 mins.
6	20:20 × 3 reps × 2 sets 120% MAS = 101.04 m in 20 s, followed by 20 s REST & 3-min rest between sets. Time spend at 120% MAS = 120 s and Session length = 05 mins.

7	15:15 × 6 reps × 2 sets 130% MAS = 82.09 m in 15 s, followed by 15 s REST & 2-min rest between sets. Time spend at 130% MAS = 180 s and Session length = 05 mins.
8	20:20 × 3 reps × 2 sets 130% MAS = 109.46 m in 20 s, followed by 20 s REST & 3-min rest between sets. Time spend at 130% MAS = 120 s and Session length = 05 mins.”

2.4 Measurement

2.4.1 Extroversion

“Extroversion, for this test the subjects responded the questionnaire. This is a personality assessment based on the Big Five model (referred interchangeably as the Five Factor Model) of personality. These Big Five are based on natural language terms that provide taxonomy and a common parlance attempting to accommodate any theoretical orientation on personality. These Big Five personality factors used in the BFI are: Openness to Experience, Conscientiousness, Extraversion/Introversion, Agreeableness, and Neuroticism (nervousness) [24].”

2.5 Statistical Analysis

The descriptive statistical analysis of collected data was calculated and values of selected variables were shown as mean ± SD. The three way ANCOVA was used to find out the significance divergence linking pre and post test data of all groups The significant point was lay down at $p<0.05$ for all cases.

3. RESULT

Tables-2

Descriptive Statistics for the data on Extroversion in different groups during treatment

Groups	Gender	Geo- Conditions	Mean	Std. Deviation	N
Experimental	Male	Urban	29.3000	3.62	10
		Rural	30.0000	3.29	10
		Total	29.6500	3.39	20
	Female	Urban	32.9000	4.09	10
		Rural	30.5000	3.24	10
		Total	31.7000	3.79	20
	Total	Urban	31.1000	4.19	20
		Rural	30.2500	3.19	20

		Total	30.6750	3.70	40
Control	Male	Urban	30.7000	2.31	10
		Rural	27.9000	2.46	10
		Total	29.3000	2.73	20
	Female	Urban	28.0000	2.10	10
		Rural	25.1000	2.76	10
		Total	26.5500	2.81	20
	Total	Urban	29.3500	2.56	20
		Rural	26.5000	2.92	20
		Total	27.9250	3.07	40
Total	Male	Urban	30.0000	3.04	20
		Rural	28.9500	3.03	20
		Total	29.4750	3.04	40
	Female	Urban	30.4500	4.04	20
		Rural	27.8000	4.03	20
		Total	29.1250	4.20	40
	Total	Urban	30.2250	3.54	40
		Rural	28.3750	3.57	40
		Total	29.3000	3.65	80

Table-3
Levene's Test of Equality of Error Variances

F	df_1	df_2	p-value
2.339	7	72	0.263

"To test the equality of variances, Levine's test was used. The F-value was insignificant as the p-value (0.263) was more than 0.05. Thus, the null hypothesis of equality of variances might be accepted, and it was concluded that the variances of the two groups were equal."

"Table-4 shows that the F-value for Pre Extroversion (covariate) is significant because p-value 0.000 is less than 0.05. It shows that the initial conditions of the experimental groups are not same, and that is why we are applying three-

Table-4: Three-way ANCOVA table for the data on Extroversion in different groups during treatment

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Pre-Extroversion	468.903	1	468.903	162.800	.000
Groups	.343	1	.343	.119	.731
Gender	4.121	1	4.121	1.431	.236
Geo-Condition	8.314	1	8.314	2.886	.094
Groups * Gender	1.496	1	1.496	.519	.473
Groups * Geo-Condition	.214	1	.214	.074	.786
Gender * Geo-Condition	.251	1	.251	.087	.768
Groups * Gender * Geo-Condition	1.044	1	1.044	.362	.549
Error	204.497	71	2.880		
Total	69734.000	80			
Corrected total	1054.800	79			

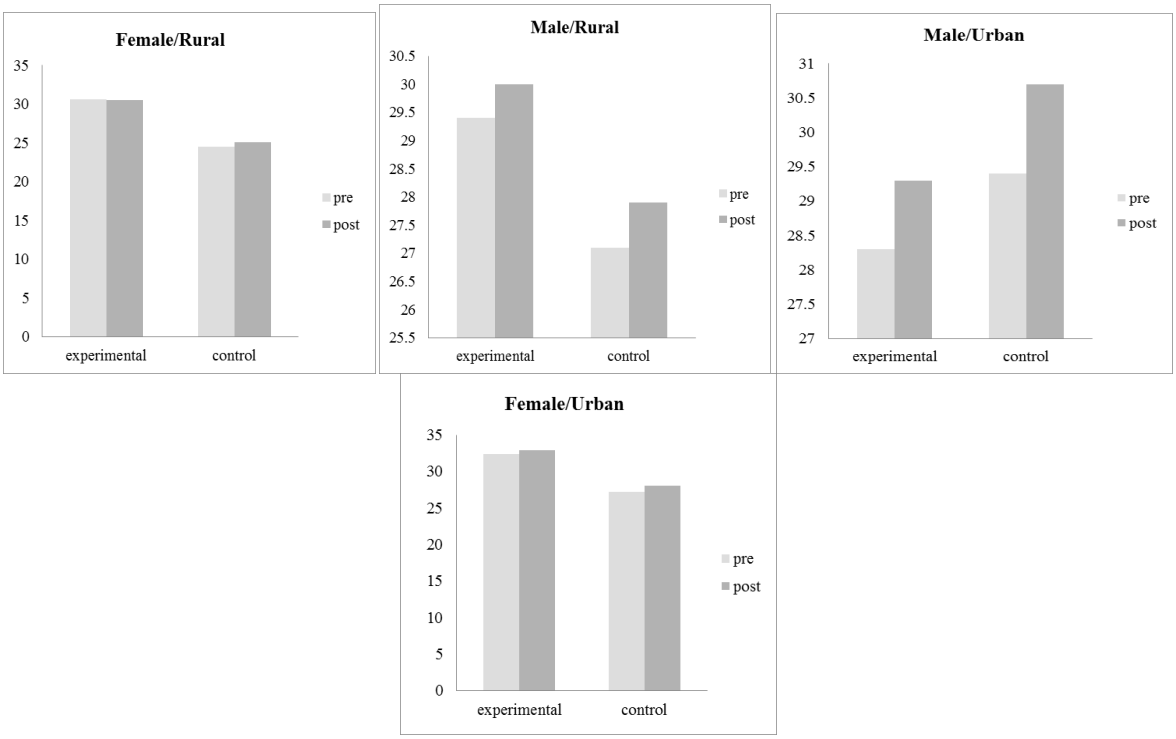
R Squared = .806 (Adjusted R Squared = .784)

way ANCOVA after adjusting mean values of the dependent variable for the covariate." Further, "The F-value for comparing the adjusted means of the Extroversion in groups (experimental and control group). The F-statistic computed for high intensity workout is insignificant because p -value associated with it is .731, which is greater than 0.05. Thus, the null hypothesis of no difference among the adjusted means for the data on Extroversion in treatment groups may not be rejected at 5% level."

Also, "The F-value for comparing the adjusted means of the Extroversion in gender (Male and Female).The F-statistic computed for high intensity workout is insignificant because p -value associated with it is .236, which is, more than 0.05. Thus, the null hypothesis of no difference among the adjusted means for the data on Extroversion in gender may not be rejected at 5% level."Furthermore, "The F-value for comparing the adjusted means of the Extroversion in geo conditions (Urban and Rural). The F-statistic computed for high intensity workout is insignificant because p -value associated with it is .094, which is more than 0.05. Thus, the null hypothesis of no difference among the adjusted means for the data on Extroversion in geo conditions may not be rejected at 5% level."Likewise, "The F-value for comparing the adjusted means of the Extroversion in interaction (groups x gender).The F-statistic computed for high intensity workout is insignificant because p -value associated with it is .473, which is more than 0.05. Thus, the null hypothesis of no difference among the adjusted means for the data on Extroversion in interaction (groups x gender) may not be rejected at 5% level."

"The F-value for comparing the adjusted means of the Extroversion in interaction (groups x geo condition).The F-statistic computed for high intensity workout is insignificant because p -value associated with it is .786, which is more than 0.05. Thus, the null hypothesis of no difference among the adjusted means for the data on Extroversion in interaction (groups' x geo conditions) may not be rejected at 5% level."Similarly, "The F-value for comparing the adjusted means of the Extroversion in interaction (gender x geo condition).The F-statistic computed for high intensity workout is insignificant because p -value associated with it is .768, which is greater than 0.05. Thus, the null hypothesis of no difference among the adjusted means for the data on Extroversion in interaction (gender x geo conditions) may not be rejected at 5% level."Also, "The F-value for comparing the adjusted means of the extroversion in interaction (groups x gender x geo conditions).The F-statistic computed for high intensity workout is insignificant because p -value associated with it is .549, which is greater than 0.05. Thus, the null hypothesis of no difference among the adjusted means for the data on Extroversion in interaction (groups x gender x geo conditions) may not be rejected at 5% level."

"In a three-way ANCOVA, the mean values of the groups of the three independent variables have been adjusted by the covariate, pre-test (i.e., they are adjusted means).This is important because the statistical significance of the three independent variables (i.e., if the group mean is statistically significantly different) is based on the adjusted mean and not the unadjusted mean. If we neglect these modified means, it will be as though ANCOVA was never working in three ways. Therefore, the estimate table presents the adjusted mean, standard error and 95% confidence interval of the adjusted mean for the dependent variable extroversion, for each combination of groups of the three independent variables: gender(i.e. Male and Female groups), geographical conditions (i.e. Urban and Rural) and groups (i.e. experimental and control groups).Since none of the factor was found significant so analyzing main effect or simple effect was not required."



4. DISCUSSION

The purpose of this study was to gauge the psychological impact of HIIT. Previous research exploring these psychological reactions, to the best of academic understanding, only discussed the time points of the pre- and post-exercise session. These studies have not previously examined the fundamental effect.[15, 25] before, and after the intense workout, we found extroversion

responses in HIT as measured by the big five-factor model, but there were no disparities in the post-activity results. In this study, results differed from those observed by Bartlett et. al[15], who found more satisfaction after HIT was registered by participants.

It is vital to evaluate that the foundational effect is strongly linked to FS and FAS, while PAES is closely connected to an emotional state.However, for each variable the data collection period was different (FS and FAS at 5 minute post-exercise and PAES at 10 post-exercise minutes).Supplemental analyses will look intothe effect of various emotions on the enactment of HIIT. In addition, methodological procedural differences, diverging outcomes can be clarified.Bartlett et al.[15] used a 3-minute interval treatment technique with a stimulus intensity of 90 percent VO2Peak and a 3-minute recovery period with a VO2Peak intensity of 50 percent; all training environments had an average VO2Peak intensity of 70 percent. The training sessions used in our research have beenestablished at an average intensity within 15 percent oxidative rate. Given the parity in VO2 values achieved during the exercises, it seems that the recovery under theseas during HIT sessions, session was limited to provide optimistic affective reactions terms, the HIT session could not be finished by more than 50 percent of the participants. Though not the subject of this research, this is an important fact because, in participant dropout situations, self-efficacy can be negatively influenced. HIT sessions with longer periods of recovery might provide smarter affective responses than that of the HIT sessions used in the present study. Future studies should explore the sprinting potential of participants to ensure that they'll be able to perform multiple tasks at high intensity.The psychological component of the affective response has had to be swayed by the magnitude of the severity of the stimulus and, subsequently, by the exercise’s predominant metabolic pathway.Following the principle of Dual-mode theory interceptive variables tend to have a negative effect on affective responses to events with intensities above the metabolic threshold[26]. This theory is widely acknowledged for CT but has not been shown for HIIT before. This theory for HIIT has also been confirmed by the present study, it shows that after a stimulus, a substantial increase in physiological responses has attributed to a substantial decrease in enjoyment after exercise, regardless of recovery periods.With longer recovery times, a few other HIIT

designs contribute to improved affective responses, and this hypothesis should really be tested in future studies. The positive rebound effect detected after exercise can also be explained by the principle of dual-mode, with proportionately higher increases in satisfaction after HIIT, which can be modulated by the severity of negative experiences during exercise[27].

The opponent-process theory[28] postulates that an opposite mechanism occurs after any affective experience (pleasant or unpleasant). Therefore, according to this theory, after an aversive stimulus or stress, a feeling of gratification may occur that can stimulate the cycle of incentives and then leads to a repetition of the stimulus.Accelerated sequencing of neuromodulatory entities such as anandamide, dopamine, serotonin, and endorphins can be associated with a reduction anxiety and enhanced pleasure after intense periods of stimulation[29]. The learning theory asserts that instantaneous affective responses will be better forecasters exercise than after the exercise session[30] This theory, indeed, has not been trailed thoroughly, and it is not well known that individuals intended to continue engaging in physical activity based on experiences handled after and during exercise. Additional researches must also look into this issue. Blanchard et al. found no modification in affective responses relying on the affliction of the training[31]. Nevertheless, we also promote potential inquiries into the impacts on training cycles of various configurations. As already shown in different training sessions, it is viable that HIT trainings with lesser anaerobic metabolism dependence can impede higher extroversion and affective responses. In additional research, psychological responses should be vetted during other HIIT setups, considering the broad variety of configurations for HIIT sessions.

CONCLUSION

As in a quite similar study where five-factor personality models and other psychological variables were used to assess the psychological responses, several authors have been using the meta-analytical analysis to determine personality- training, status relationships. Results somewhere revealed significant variations in personality dimensions. The result of the present study concluded that the extroversion psychological characteristic was not significantly improved, but mean differences showed quite better results in

urban female and rural male subjects of physical education students after applied twelve weeks HIIT training *so*, we encouraging future investigations into the effects of different setups for training intervals.

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