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Research Paper

A Comparative Study of Selected Big – Five Personality Traits

and Physiological Parameters Between Sportpersons and Non –

Sportspersons of New Delhi

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ABSTRACT

The purpose of this study was to compare selected big - five personality traits and physiological parameters between sportsperson and non - sportsperson of New Delhi India. The main objective of this research study is to compare personality traits and physiological parameters of Sportsperson and Non – Sportsperson. Keeping in view the purpose of this research in mind, the researcher had randomly selected 35 non-sportsperson and 35 national level players. To complete this research, the subjects were divided into two groups, in which sportspersons were kept in experimental and non - sportsperson in controlled group. The age of subjects between 15 - 25 years. The selected all subjects were the natives of New Delhi. Standardized BIG FIVE Questionnaire was used to test personality traits among Sportsperson and Non - Sportsperson. BIG Five personality traits such as Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism. Other hand side Physiological Parameters such as Body composition, Vital capacity and Heart rate were used to assess. Result: The result of the current study suggests that there are only two selected Big – five personality traits Extraversion and Agreeableness was found statistically significant on both Experiment and control group. $P \le 0.05$, and it was evident from the table 3 that there are two selected Physiological parameters namely Body Composition and Vital Capacity was found statistically significant on both Experiment and Control group $P \le 0.05$.

Keywords: Comparative study, Psychology, Physiology, Big five personality assessment scale, Heart rate, Vital capacity and Body composition.

Psychology touches almost every aspect of our lives. Psychology has assumed an increasingly important role in solving human problems. Knowledge of Psychology is helpful events to people who do not plan to pursue it as a carrier. Studying Psychology provides insight into why people behave as they do. It also helps us better understanding our own thoughts, feelings behavior and attitudes and hopefully, it can strengthen our appreciation of and tolerance for the wide differences diverse and fascinating field-one that delves into virtually every aspects of the human behavior. Psychology is a science that systematically studies the observable human behavior and its relation with the

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unseen mental process which go on inside the organism as well as external events in the environment. The primary aim of psychology it is to find the laws which relate Behavior to situation, conditions and other behaviors.

Sports psychology

Sport psychology is an interdisciplinary science that draws on knowledge from many related fields including biomechanics, physiology, kinesiology and psychology. It involves the study of how psychological factors affect performance and how participation in sport and exercise affect psychological and physical factors. Sport psychologists teach cognitive and behavioral strategies to athletes in order to improve their experience and performance in sports. In addition to instruction and training of psychological skills for performance improvement, applied sport psychology may include work with athletes, coaches, and parents regarding injury, rehabilitation, communication, team building, and career transitions. Also, closely associated with Sports psychiatry. "Sports Psychology is the application of psychological principles to sports and physical activity at all level of skills improvement" (Browne and Mahoney) "sports psychology encompasses various branches of psychology as they are related to our ability to understand athlete performance, how to make it better and how to improve exercise programs.

In simple terms sports psychology is the study of the effects of the psychological and emotional factors on sports performance and the effect of sports involvement on psychological and emotional factors. These psychological and emotional factors can fine turn and learned which can have a positive effect on athlete's performance in sports and his overall psychological and emotional makeup. Cox, H. Richard. (2002).

Sports psychology, in words of Singer, "encompasses research counselling/clinical, education, and practical/programmatic activities associated with understanding, explaining and influencing selected behavior of individual and group involved in high level activities". Sports psychology is striving hard to investigate athletic performance, to stability it, and to seeking on appropriate balance between psychological and psychological dimensions of performance.

Big – Five Theory of Personality

The Big Five personality traits are a suggested taxonomy, or grouping, for personality traits, developed from the 1980s onwards in psychological trait theory. When factor analysis (a statistical technique) is applied to personality survey data, it reveals semantic associations: some words used to describe aspects of personality are often applied to the same person. For example, someone described as conscientious is more likely to be described as "always prepared" rather than "messy".

These associations suggest five broad dimensions used in common language to describe the human personality, temperament and psyche.

Starting in the 1990s, the theory identified five factors by labels, for the US. English speaking population, typically referred to as:

- Openness to experience (inventive/curious vs. consistent/cautious)
- Conscientiousness (efficient/organized vs. extravagant/careless)
- Extraversion (outgoing/energetic vs. solitary/reserved)
- Agreeableness (friendly/compassionate vs. critical/rational)

• Neuroticism (sensitive/nervous vs. resilient/confident)



Fig: 1 Big Five Theory of Personality

Exercise Physiology

Exercise Physiologists are the highest qualified exercise professionals and utilize education, lifestyle intervention and specific forms of exercise to rehabilitate and manage acute and chronic injuries and conditions. Understanding the effect of exercise involves studying specific changes in muscular, cardiovascular, and neurohumoral systems that lead to changes in functional capacity and strength due to endurance training or strength training. The effect of training on the body has been defined as the reaction to the adaptive responses of the body arising from exercise or as "an elevation of metabolism produced by exercise.

Body Composition

In physical fitness, body composition is used to describe the percentages of fat, bone, water and muscle in human bodies. Because muscular tissue takes up less space in the body than fat tissue, body composition, as well as weight, determines leanness. Two people of the same gender and body weight may look completely different because they have a different body composition.



Fig: 2 Illustration of Body Composition

Heart Rate

Heart rate is the speed of the heartbeat measured by the number of contractions (beats) of the heart per minute (bpm). The heart rate can vary according to the body's physical needs, including the need to absorb oxygen and excrete carbon dioxide, but is also modulated by a myriad of factors including but not limited to genetics, physical fitness, stress or

psychological status, diet, drugs, hormonal status, environment, and disease/illness as well as the interaction between and among these factors. It is usually equal or close to the pulse measured at any peripheral point.



Fig: 3 Illustration of Heart Rate

The American Heart Association states the normal resting adult human heart rate is 60–100 bpm. Tachycardia is a high heart rate, defined as above 100 bpm at rest. Bradycardia is a low heart rate, defined as below 60 bpm at rest. During sleep a slow heartbeat with rates around 40–50 bpm is common and is considered normal. When the heart is not beating in a regular pattern, this is referred to as an arrhythmia. Abnormalities of heart rate sometimes indicate disease.

Vital Capacity

Vital capacity (VC) is the maximum amount of air a person can expel from the lungs after a maximum inhalation. It is equal to the sum of inspiratory reserve volume, tidal volume, and expiratory reserve volume. It is approximately equal to Forced Vital Capacity (FVC). A person's vital capacity can be measured by a wet or regular spirometer. In combination with other physiological measurements, the vital capacity can help make a diagnosis of underlying lung disease. Furthermore, the vital capacity is used to determine the severity of respiratory muscle involvement in neuromuscular disease, and can guide treatment decisions in Guillain–Barré syndrome and myasthenic crisis. [citation needed]



Fig: 4 Illustration of Vital Capacity

A normal adult has a vital capacity between 3 and 5 liters. A human's vital capacity depends on age, sex, height, mass, and possibly ethnicity. However, the dependence on ethnicity is poorly understood or defined, as it was first established by studying black slaves in the 19th

century and may be the result of conflation with environmental factors. Lung volumes and lung capacities refer to the volume of air associated with different phases of the respiratory cycle. Lung volumes are directly measured, whereas lung capacities are inferred from volumes.

Hypothesis of the study

- 1. There is statistically significant difference of selected personality traits between sportsperson and non non-sportsperson at level 0.05.
- 2. There is statistically significant difference of selected physiological parameters between sportsperson and non non-sportsperson at level 0.05.

MATERIAL AND METHOD

Participant

Keeping in the purpose of the study, 35 sportspersons and 35 non-sportspersons was randomly selected. All these subjects were residents of the Union Territory of New Delhi and their age ranged from $15 \ge 25$ years. The selected all subjects were the natives of New Delhi. The selected 35 Sportsperson had participated in the national level competitions.

Selection of Groups

The research scholar divided subjects into two groups to complete this research, one group in which sportsperson were randomly selected and placed in the Experiment group and the other side non-sportsperson were randomly selected and placed in the Control group.

Instrumentation

The Big Five Standardized questionnaire was used to measure psychological variables. Skinfold Caliper was used to measure body composition, Heart Rate monitor was used to measure heart rate, and similarly spirometry to measure vital capacity, of the physiological variables.



Fig: 5 Illustration of Skinfold Caliper



Fig: 6 Illustration of Heart Rate Monitor



Fig: 7 Illustration of Spirometry

Selection of Variables and Parameters

The selected variables and parameters are documented in the table 1

Table: 1 Selec	ted Variables	and Parameters	of the study
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S. No.	Selected Parameters	Selected Variables	Abbreviations
1	Big – Five Personality Scale	Openness OP	
		Conscientiousness	СТ
		Extraversion	EX
		Agreeableness	AS
		Neuroticism	NU
2	Physiological	Body Composition	BC
		Heart Rate	HR
		Vital Capacity	VC

Table 1. shows that the selected variables and parameters of the study. Big - Five personality traits such as Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism was used to measured psychological variables and Body composition, Heart rate and Vital capacity was used to measure Physiological variables. The selected abbreviations such as OP stand for Openness, CT stand for Conscientiousness, EX stand for Extraversion, AS stand for Agreeableness, NU stand for Neuroticism, BC stand for Body Composition, HR stand for Heart rate and VC stand for Vital capacity.

Data Acquisition

Before collecting the data, all the subjects were explained about the study and motivated so that they all actively participate. Data collection was done in two phases. In the first phase, the Big Five questionnaire was used to measure the personality traits, and physiological parameters was used to measure physiological variables of sportsperson. In the second phase, data of non-sportspersons was also collected in a similar manner.

Data Processing

The raw data acquired from the subjects (sportsperson and non – sportsperson) were quantified with the help of Standardized Big – five assessment scale and physiological parameters. In this research, IBM® SPSS® statistical version 26 (2019) was used to data analysis.

Statistical Analysis

Following statistical methods were applied for analysis.

- 1. Descriptive statistics (Mean and Standard Deviation).
- 2. Paired group T Test was used to compare means between Exp. group (Sportsperson) and Cont. group (Non- Sportspersons).

S. No.	Variables	Groups	Mean	Std. Deviation	't'	Sig.
1.	Openness	Exp.	17.43	2.821		
		Cont.	16.57	2.842	1.446	.157
2.	Conscientiousness	Exp.	15.37	2.315		
		Cont.	14.57	3.156	1.468	.151
3.	Extraversion	Exp.	16.00	1.910		
		Cont.	14.40	1.882	3.000	0.05
4.	Agreeableness	Exp.	14.57	2.187		
		Cont.	12.40	3.051	3.367	.002
5.	Neuroticism	Exp.	1.29	2.204		
		Cont.	14.71	2.707	2.543	.016

Table: 2 Descriptive Statistics of each Big – Five Personality traits.

* The level of significance at 0.05

* *Exp.* = *Experiment Group (Sportsperson)*

* Cont. = Control Group (Non-sportsperson)

According to the Table: 2 the selected variable Namely Openness the mean value and SD was found Experiment group is 17.43 ± 2.821 and Control group was 16.57 ± 2.842 . It was evident from the table that there was not significant difference found between Experiment group and Control group data on Openness as 't' 1.446, $p \ge 0.05$. The result is specified that which was not statistically significant difference at 0.05.



Fig: 8. Graph represent of mean difference between Exp. group and Con. group of Openness

According to the Table: 2 the selected variable namely "Conscientiousness", the mean value and SD was found Experiment group is 15.37 ± 2.315 and Control group was 14.7 ± 3.156 . It was evident from the table that there was not significant difference found between Experiment group and Control group data on Conscientiousness as 't' 1.468, $p \ge 0.05$. The result is specified that which was a statistically significant difference between both groups at 0.05.



Fig: 9. Graph represent of mean difference between Exp. and Cont. Group of Conscientiousness

According to the Table: 2 the selected variable namely "Extraversion", the mean value and SD was found Experiment group is 16.00 ± 1.910 and Control group was. 14.40 ± 1.882 . It was evident from the table that there was a significant difference found between Experiment group and Control group data on Openness as 't' 3.000, $p \le 0.05$. The result is specified that which was not statistically significant difference between both groups at 0.05.



Fig: 10. Graph represent of mean difference between Exp. and Cont. Group of Extraversion

According to the Table: 2 the selected variable namely "Agreeableness", the mean value and SD was found Experiment group is 14.57 ± 2.187 and Control group was 12.40 ± 3.051 . It was evident from the table that there was significant difference found between Experiment group and Control group data on Agreeableness as 't' 3.367, $p \le .002$. The result is specified that which was statistically significant difference between both groups at 0.05.



Fig: 11. Graph represent of mean difference between Exp. and Cont. Group of Agreeableness.

According to the Table: 2 the selected variable namely "Neuroticism", the mean value and SD was found Experiment group was 16.29 ± 2.204 and Control group was 14.71 ± 2.707 . It was evident from the table that there was not significant difference found between

Experiment group and Control group data on Neuroticism as 't' 2.543, $p \ge .016$. The result is specified that which was not significant difference between both groups at 0.05.



Fig: 12. Graph represent of mean difference between Exp. and Cont. Group of Neuroticism.

Tuble. 5 Descriptive Statistics of cach Thysiological parameters						
S. No.	Variables	Groups	Mean	Std. Deviation	't'	Sig.
1.	Body Composition	Exp.	21.5189	3.81378		
		Cont.	19.0437	3.81523	3.009	0.05
2.	Heart Rate	Exp.	86.57	16.514		
		Cont.	87.91	14.567	.409	.685
3.	Vital Capacity	Exp.	28.60	8.172		
		Cont.	16.34	5.407	8.047	0.01

 Table: 3 Descriptive Statistics of each Physiological parameters

* The level of Significance at 0.05.

* *Exp.* = *Experiment Group (Sportsperson)*

* Cont. = Control Group (Non-sportsperson)

According to the Table: 3 the selected parameters namely "Body Composition", the mean value and SD was found Experiment group is 21.5189 ± 3.81378 and Control group was 19.0437 ± 3.81523 . It was evident from the table that there was statistically significant difference found between Experiment group and Control group data on Body Composition as 't' 3.009, $p \le 0.05$. The result is specified that which was statistically significant difference between both groups of data at 0.05.



Fig: 13. Graph represent of mean difference between Exp. and Cont. Group of Body composition.

According to the Table: 3 the selected parameter namely "Heart Rate", the mean value and SD was found Experiment group is 86.57 ± 16.514 and Control group was 87.91 ± 14.567 . It

was evident from the table that there was not significant difference found between Experiment group and Control group data on Heart rate as 't'.409, $p \ge .685$. The result is specified that which was not statistically significant difference between both groups of data at 0.05.



Fig: 14. Graph represent of mean difference between Exp. and Cont. Group of Heart rate.

According to the Table: 3 the selected parameter namely "Vital Capacity", the mean value and SD was found Experiment group is 28.60 ± 8.172 and Control group was 16.34 ± 5.407 . It was evident from the table that there was a significant difference found between Experiment group and Control group data on Vital capacity as 't'. 8.047, $p \le .001$. The result is specified that which was statistically significant difference between both groups of data at 0.05.



Fig: 15. Graph represent of mean difference between Exp. and Cont. Group of Vital Capacity.

DISCUSSION AND FINDINGS

Major Findings Big – Five Personality traits

- 1. In the present study, the result is specified that the selected Big five Personality traits namely "Openness" was not statistically significant different between Experiment group and Control group data at level 0.05.
- 2. The selected variable "Conscientiousness" was not statistically significant between Experiment group and Control group data at level 0.05.
- 3. The selected variable "Extraversion" was statistically significant between Experiment group and Control group data at level 0.05.
- 4. The selected variable "Agreeableness" was found statistically significant between Experiment group and Control group data at level 0.05.

5. The selected variable "Neuroticism" was not statistically significant between Experiment group and Control group data at level 0.05.

Major Findings of Physiological Parameters

- 1. The selected parameter "Body Composition" was found statistically significant between Experiment group and Control group data at level 0.05.
- 2. The selected parameter "Heart Rate" was not statistically significant between Experiment group and Control group data at level 0.05.
- 3. The selected parameter "Vital Capacity" was found statistically significant between Experiment group and Control group at level 0.05.

CONCLUSIONS

Within the delimiting and limiting of the study, following conclusion has been drawn:

- 1. The result of the current study suggests that there are only two selected Psychological variables Extraversion and Agreeableness was found statistically significant on both Experiment and Control group.
- 2. It was evident from the table 3 that there are two selected Physiological variables namely Body Composition and Vital Capacity was found statistically significant on both Experiment and Control group.
- 3. It has been revealed from this research study that all the selected variables of psychological namely Openness, Conscientiousness and Neuroticism other hand variable of physiological namely Heart Rate, there was a difference between Experiment group (Sportspersons) and Control group (Non-Sportspersons), although this difference was not statistically significant at level 0.05.

Testing Hypothesis

- **Hypothesis 1:** Based on the above facts, it was concluded that out of the five variables of personality traits between sports and non sportsperson, there are only two variables is statistically significant and other three variables were not statistically significant at level 0.05; hence the alternate (experimental) hypothesis is rejected and null hypothesis is accepted.
- **Hypothesis 2:** There is statistically significant difference of physiological parameters between sportsperson and non sportsperson at level 0.05. Hence the null hypothesis is rejected and alternate (experimental) hypothesis is accepted

Recommendation

- It has been proved from current research study that it will be useful for coaches and trainers in improving the performance of sports.
- We can do similar research studies to compare other psychological and physiological variables.
- We can do similar research studies on other games and sports.

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Conflict of Interest

The author(s) declared no conflict of interest.

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