

AN ANALYSIS OF SENSORY COMPONENTS IN MENTAL IMAGERY AMONG MALE AND FEMALE SHOOTING ATHLETES

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Abstract

This study investigates the role of mental imagery in male and female shooters, examining six sensory dimensions: visual, auditory, gustatory, olfactory, tactual, and organic sensations. A sample of 60 shooters (30 males and 30 females) aged 14-20, from various schools and academies, was assessed using a mental imagery questionnaire created by Prof. M. Rajamanickam. Results showed significant differences between genders in several sensory dimensions. For visual sensation, the mean score was 68.4 for males and 49.33 for females, with a t-value of 2.1, indicating significance at the 0.05 level. In auditory sensation, males had a mean of 50.13, while females had 65.6 ($t = 2.49, p < 0.05$). Tactual sensation scores were

68.76 for males and 53.2 for females ($t = 2.32, p < 0.05$), while organic sensation scores were 57.26 for males and 71 for females ($t = 4.78, p < 0.05$). Gustatory and olfactory sensations, with t-values of 0.2 and 0.3 respectively, showed no significant differences between genders. These findings highlight the role of mental imagery in enhancing focus, confidence, and performance, with implications for training in competitive sports. Future research is recommended to extend this study across different age groups, levels of competition, and sports such as air rifle and archery to better understand the psychological factors affecting athletic performance.

Keywords: Mental Imagery, Sports Psychology, Sensory Dimensions, Visual Sensation, Auditory Sensation, Gustatory Sensation, Olfactory Sensation, Tactual Sensation.

Introduction

In contemporary sports, psychological techniques are crucial for enhancing performance and supporting athletes' mental well-being. Sports psychology, which applies principles of

psychology to athletic training, seeks to optimize mental fitness, helping athletes achieve their peak performance. At elite levels, where the skill gap between competitors is minimal, psychological training often determines who reaches the top. Mental imagery has emerged as one of the most effective tools to enhance focus, consistency, and resilience in sports.

Understanding Mental Imagery

Mental imagery dates back to Aristotle's concept of "Phantasma" around 350 BC. Over time, it has become a significant practice in sports psychology, offering athletes a way to rehearse and prepare

mentally without physical exertion. Mental imagery involves creating vivid, sensory-rich visualizations in the mind, replicating real experiences across multiple senses—such as sight, sound, touch, taste, smell, and bodily sensations. This technique helps athletes strengthen their mental focus, reinforce confidence, and enhance resilience in high-pressure situations.

In competitive sports, mental imagery is used to tackle weaknesses, practice specific techniques, and manage anxiety. Many elite athletes, including Michael Phelps, have attributed their success to extensive mental practice. Phelps reported visualizing every detail of his races, which helped him stay calm and focused, even in challenging conditions.

The Role of Mental Imagery in Shooting

In shooting sports, where success hinges on precision, mental stability, and focus, mental

imagery is especially valuable. Shooters use imagery to mentally rehearse their technique, visualize their aim, and simulate competition environments. By vividly recalling past successes and visualizing ideal performances, shooters can enhance their focus and maintain composure under pressure, ultimately boosting their performance in actual competitions.

This study explores mental imagery among male and female shooters, focusing on six sensory dimensions: visual, auditory, gustatory, olfactory, tactual, and organic sensations. By examining these dimensions, the research aims to uncover gender-based differences in mental imagery use, providing insights that may enhance training techniques across genders.

SELECTION OF THE SUBJECT

To conduct the study 60 players in which 30 male shooters and 30 female shooters. The entire sample selected from different schools and academies of different districts and the selected samples represented at district, state and national level tournaments. The age of the subject range between 14 to 20 years. All the samples were selected as random basis.

RELIABILITY OF DATA

The Reliability Of Data Was Ensured By Establishing The Instrument Reliability And Its Competency. Questionnaire Competency & Reliability Of Test – The Mental Imagery Was Used. Questionnaire Competency Was Evaluated Together With The Reliability Of Tests.

SELECTION OF VAIRIABLES

- Mental imagery

CRITERIA OF MEASURES / TOOL USED

To solve above mentioned following test were selected –

Mental imagery questionnaire was developed by – Prof. M. Rajamanickam (Chennai)

ADMINSTRATION OF THE TEST

The subject was seated in a well-managed shooting range and the questionnaire was distributed along with the pen. After distribution of questionnaire gives a brief description about the purpose of study and how to fill up the questionnaire. The subject was choosing that options only which they adject experienced the feeling in mental

imagery.

QUESTIONNAIRE'S MENTAL IMAGERY

The mental imagery questionnaire designed by prof. m. Rajamanickam (Chennai), was used to measure the mental imagery. before the administration of test the subject was gives the required information about the test.

SCORING

Mental imagery scores are recorded with very clear and vivid image score 5, fairly vivid image score 4, just clear score 3, somewhat clear score 2, dim image score 1, no image 0.

STATISTICAL PROCEDURE

Statistics plays an important role in collection, presentation, analysis and interpretation of numerical data. There are some methods of mathematical formulas, models and technique which helps individual for statistical analysis of raw data. statistical techniques provide different ways to calculate the data of concerned research topics. In this study the following statistical techniques were used for analysis of data-

- Mean/Average.
- Standard Deviation (SD)
- 't' Test
- in all cases 0.05 levels was fixed to test the hypothesis which are set for the present study.

Scoring

It is a very important chapter whereas data is analyzed and interpreted. The raw data has no significant value until it is analyzed and interpreted in a proper way. Without interpretation of data researcher cannot achieve his/her objective. In this chapter objective, hypothesis and data was tested with statistical formula. After the collection data it is must be processed and analyzed and draw in a proper way.

The difference of mental subjected to statistical treatment while using 't' test. The 't' test applied on subjects and result displayed in tables. The significance of test was fixed 0.05 level of confidence, it is considered as authentic confidence level.

TABLE NO.1

Showing of mean value between boys and girls regarding visual sensation Under mental imagery

GROUP	N	MEAN	SD	t-value
BOYS	30	68.4	3.9	2.1*
GIRLS	30	49.33	7.75	

't' (0.05) = .00

From table no. 1 result show that, the mean value of boys and girls regarding visual sensation time were 68.4 and 49.33 respectively. The calculated 't' value is 2.1 which is greater than the table value (2.00) which is significant at 0.05 level. So, there is significant difference was found between male and female shooters of visual sensation.

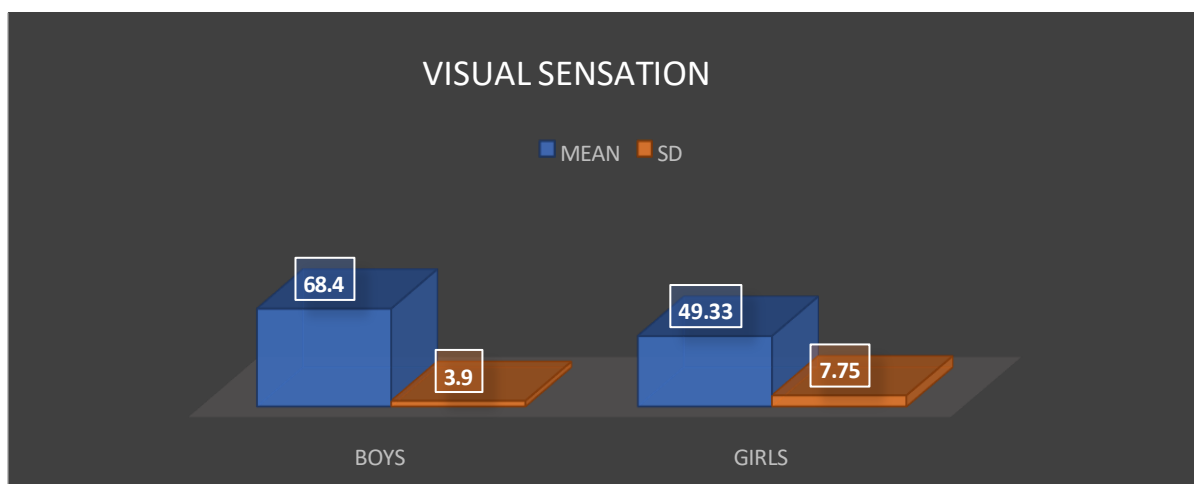


FIGURE NO.1

TABLE NO – 2

Showing of mean value between boys and girls regarding auditory sensation Under mental imagery

GROUP	N	MEAN	SD	t-value
BOYS	30	50.13	11.13	2.49*
GIRLS	30	65.6	4.56	

*t' (0.05) =2.00

From the table no.2, result represent that the mean value of boys and girls regarding auditory sensation were 50.13 and 65.6 respectively. The calculated 't' value is 2.49 which is greater than the table value which is significant at 0.05 level. There is significant difference was found between male and female shooters of auditory sensation.

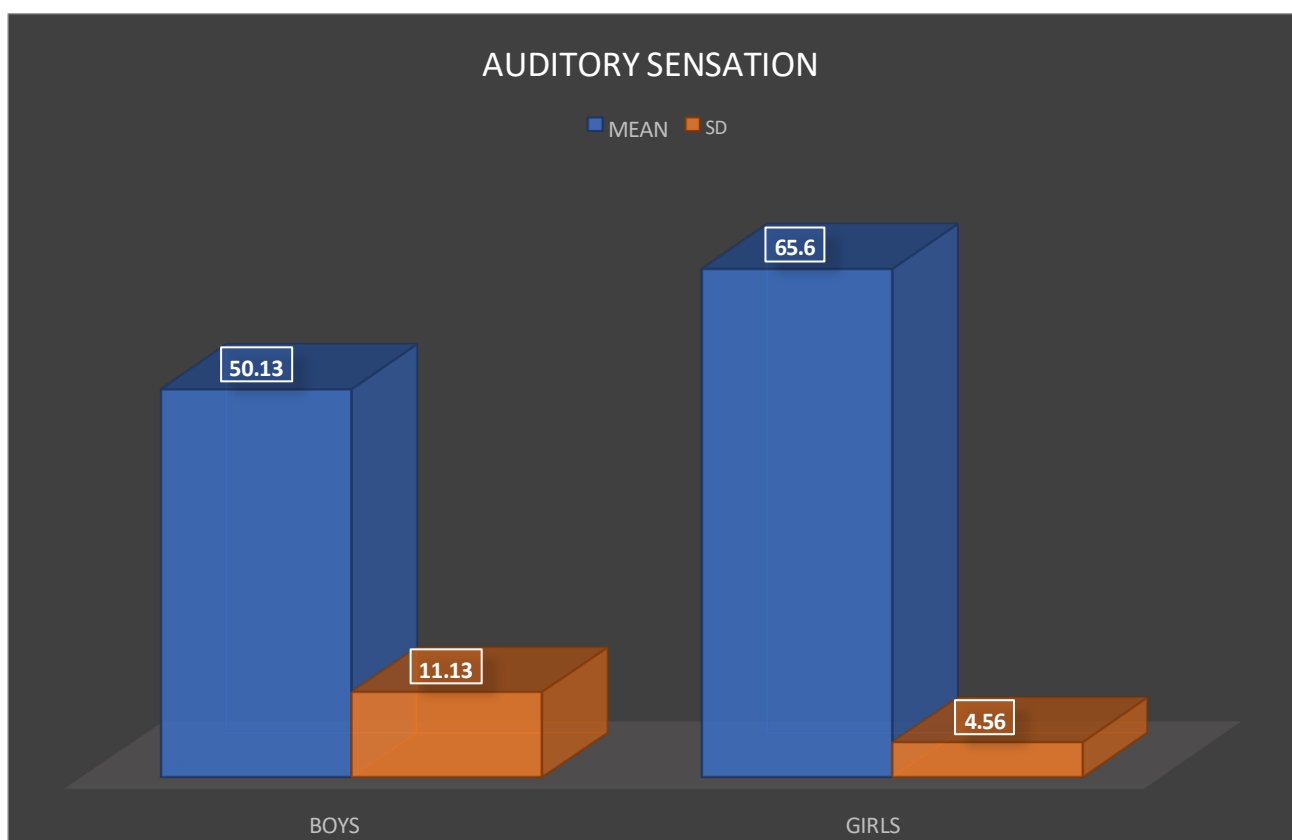


FIGURE NO.2

TABLE NO-3

Showing of mean value between boys and girls regarding gustatory sensation Under mental imagery

GROUP	N	MEAN	SD	t-value
BOYS	30	53.7	9.5	0.2
GIRLS	30	57.26	11.76	

't' (0.05) = 2.00

From the table no.3, result represent that the mean value of boys and girls regarding auditory sensation were 53.7 and 57.2 respectively. The calculated 't' value is 0.20 which is less than the table value at 0.05 level. No significant difference was observed between male and female shooters of gustatory sensation.

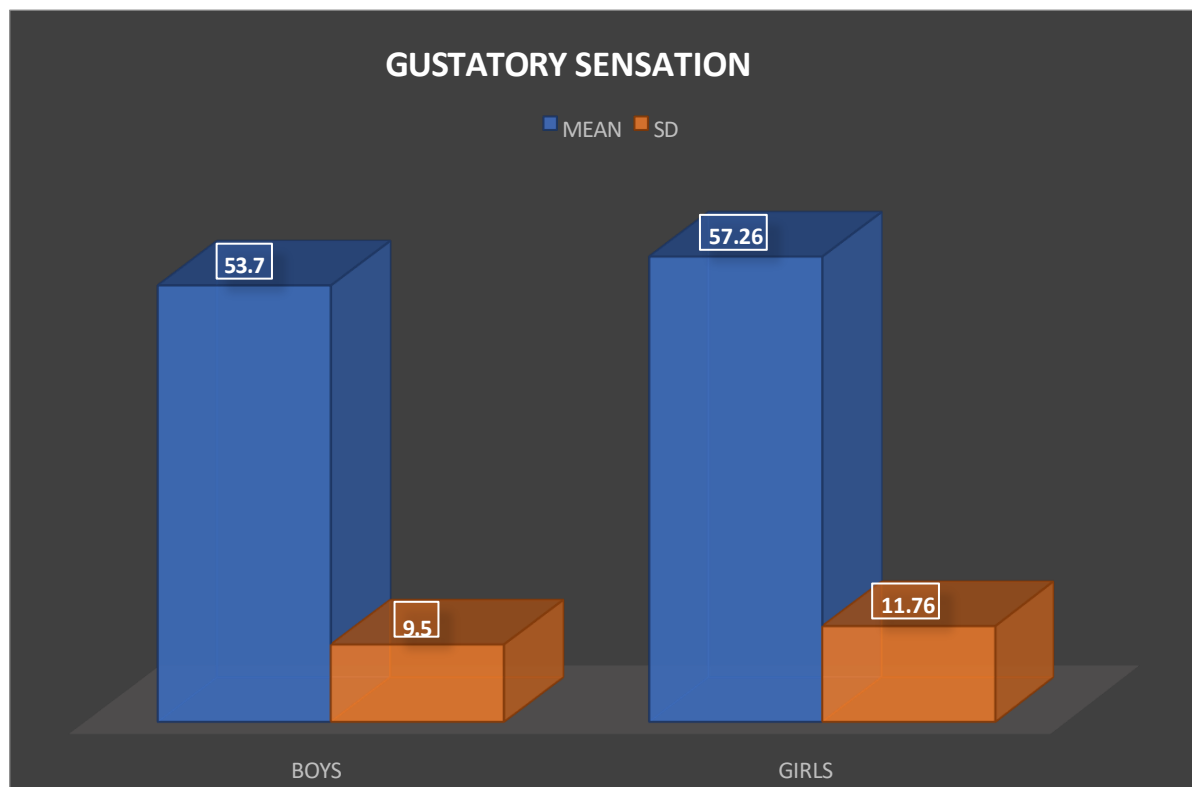


FIGURE NO .3

TABLE NO -4 Showing of mean value between boys and girls regarding olfactory sensation Under mental imagery

GROUP	N	MEAN	SD	t-value
BOYS	30	49.1	10.36	0.3
GIRLS	30	52.13	12.07	

't' (0.05)=2.00

From the table no.4, result represent that the mean value of boys and girls regarding auditory sensation were 49.1 and 52.13 respectively. The calculated 't' value is 0.30 which is less than the table value which is at 0.05 level. No significant difference was observed between male and female shooters of olfactory sensation.

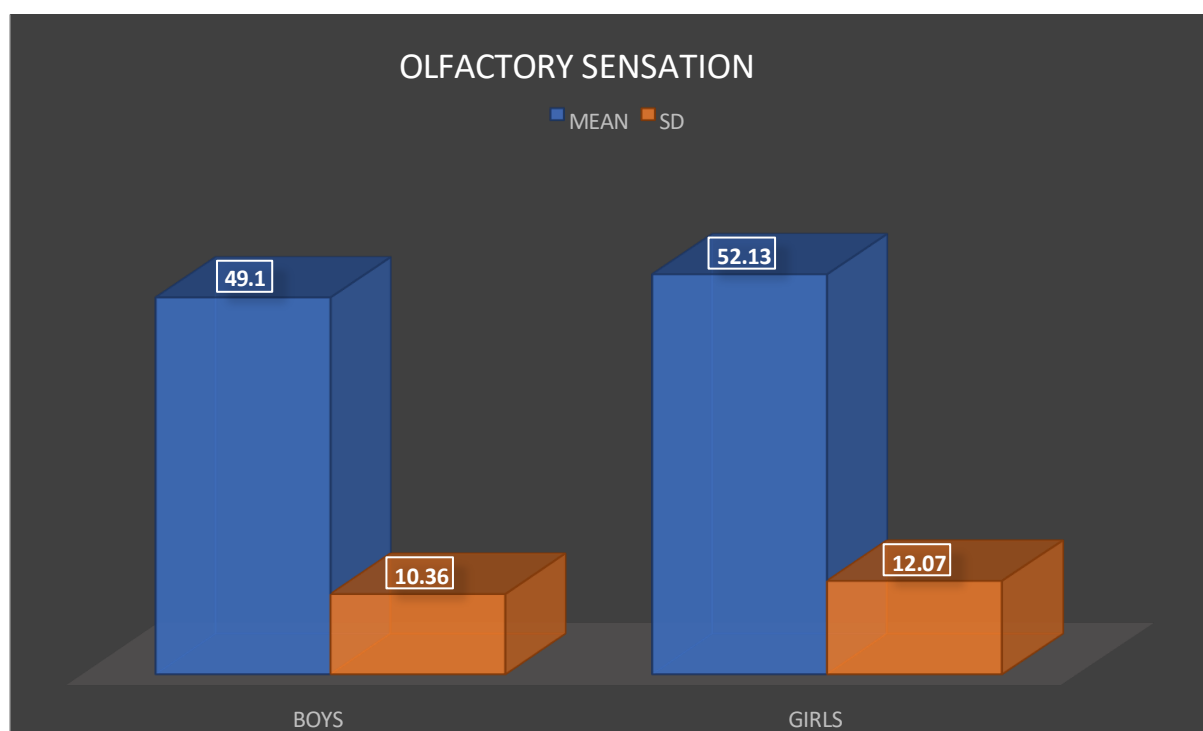


FIGURE NO.4

TABLE NO-5 Showing of mean value between boys and girls regarding Tactual Sensation Under mental imagery

GROUP	N	MEAN	SD	t-value
BOYS	30	68.76	5.81	2.32*
GIRLS	30	53.2	15.11	

't' (0.05) = 2.00

From the table no.5, result represent that the mean value of boys and girls regarding tactual sensation were 68.76 and 53.2 respectively. The calculated 't' value is 2.32 which is greater than the table value which is significant at 0.05 level. There is significant difference was found between male and female shooters of tactual sensation.

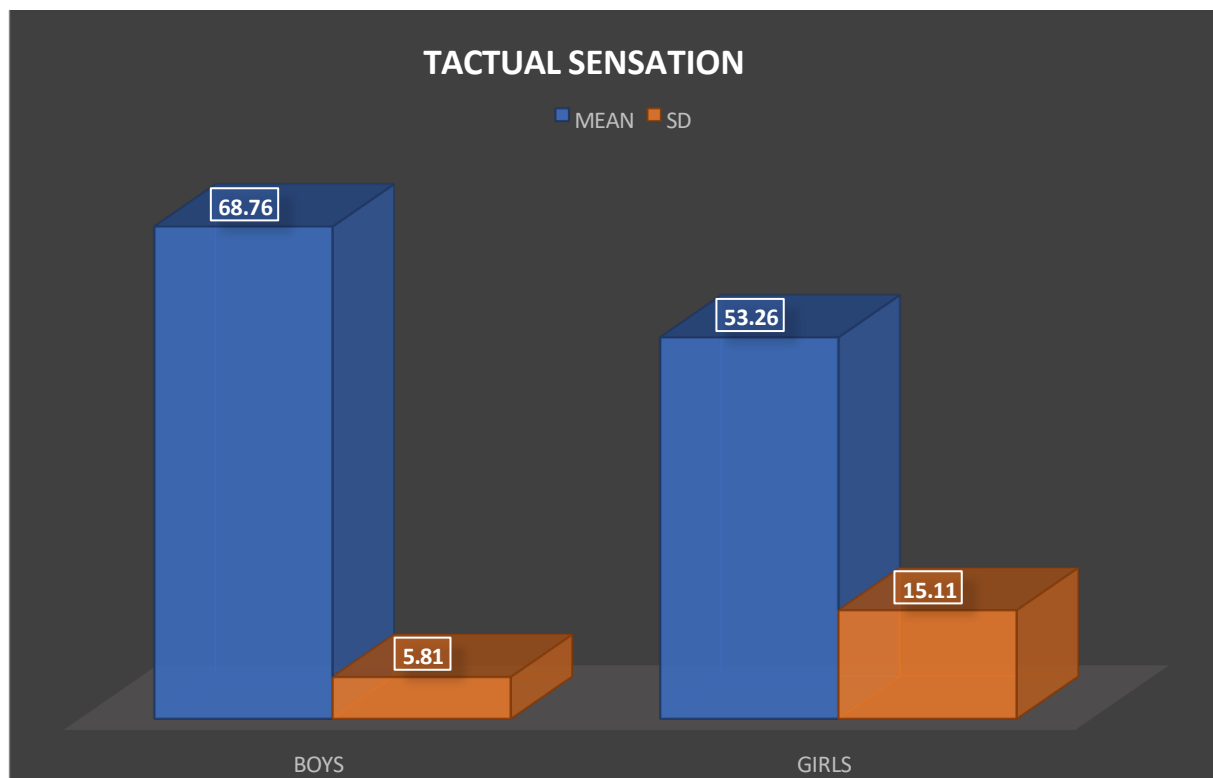


TABLE NO -6 Showing of mean value between boys and girls regarding organic sensation Under mental imagery

GROUP	N	MEAN	SD	t-value
BOYS	30	57.26	9.63	4.78*
GIRLS	30	71	2.94	

$t'(0.05)=2.00$

From the table no.6, result represent that the mean value of boys and girls regarding organic sensation were 57.26 and 71 respectively. The calculated 't' value is 4.78 which is greater than the table value which is significant at 0.05 level. There is significant difference was found between male and female shooters of organic sensation.

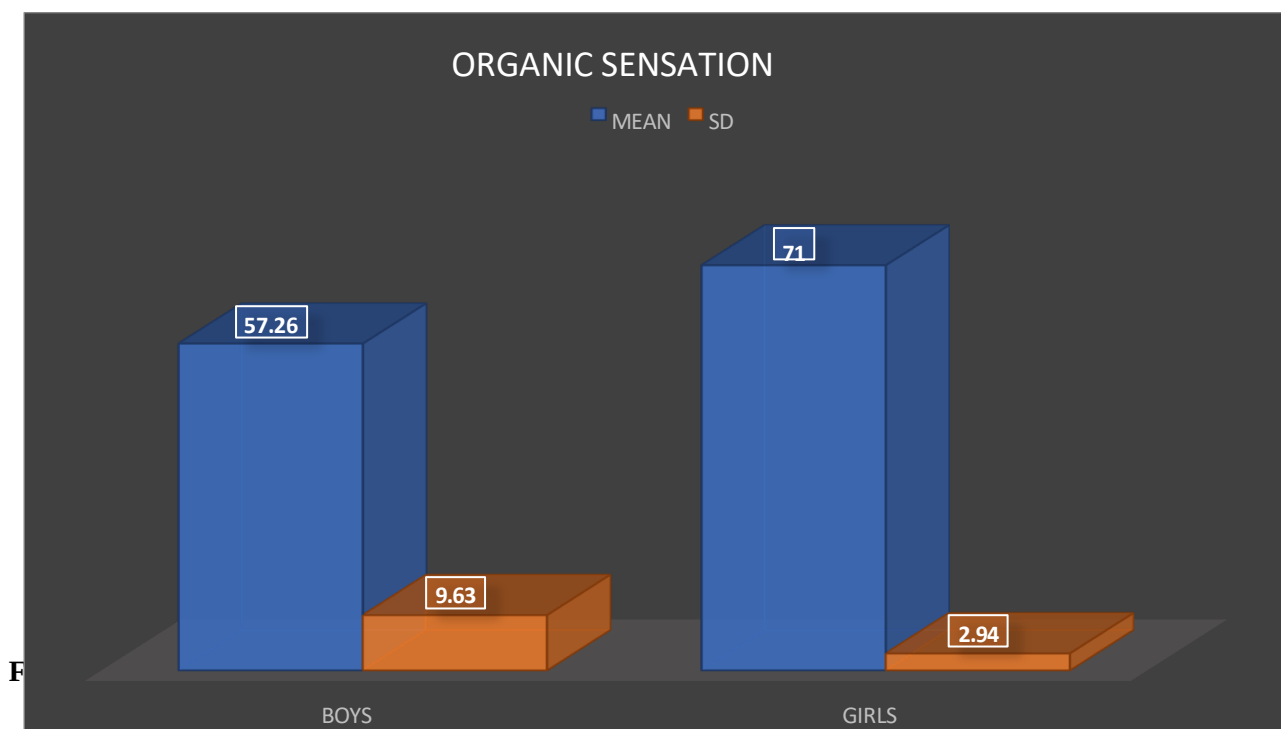
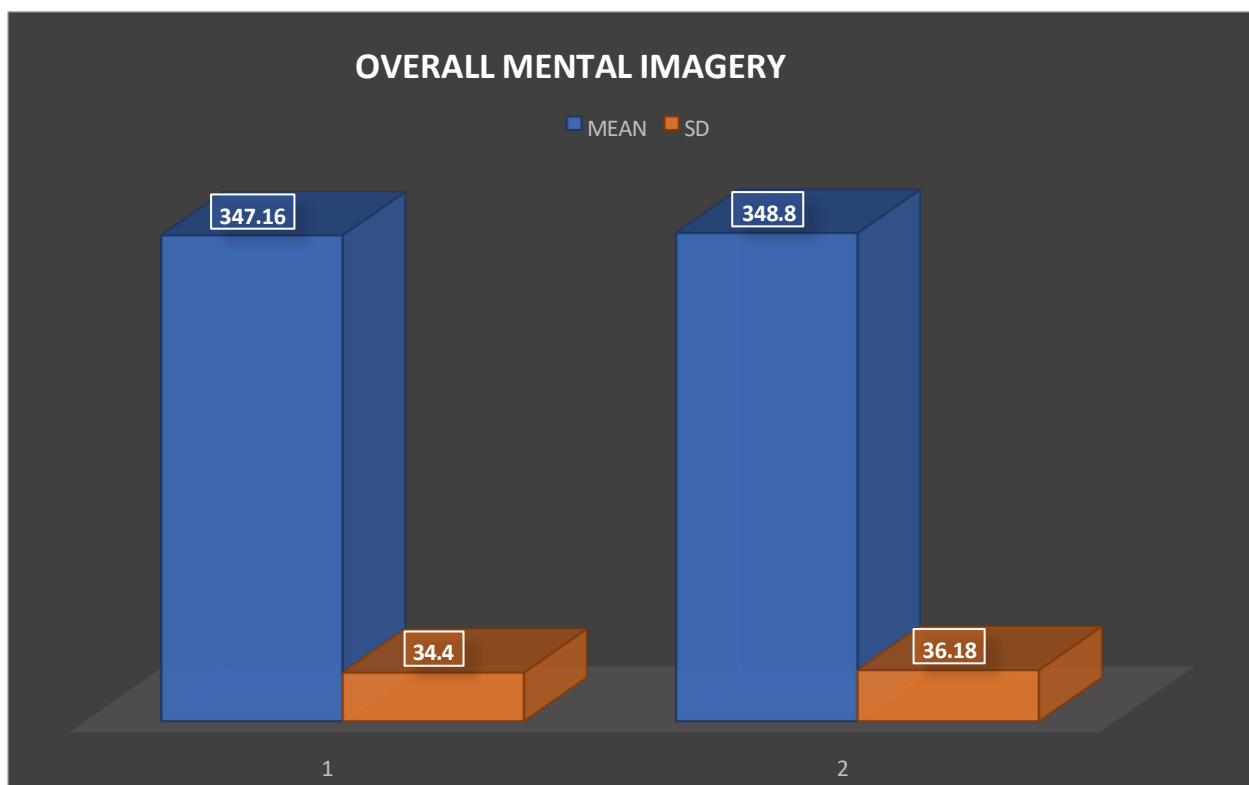


TABLE NO-7 Showing of mean value between boys and girls regarding overall mental imagery

GROUP	N	MEAN	SD	t-value
BOYS	30	347.16	34.4	0.85
GIRLS	30	348.8	36.18	

$t'(0.05)=2.00$

From the table no.7, result represent that the mean value of boys and girls regarding overall mental imagery were 347.16 and 348.8 respectively. The calculated 't' value is 0.85 which is less than the table value at 0.05 level. There is significant difference was found between male and female shooters of overall mental imagery.



DISCUSSION ON HYPOTHESIS

The first hypothesis of the study stated that, there is significant difference between male and female shooters so, the hypothesis is accepted in mental imagery. After the conduct of this research, the result proved that there is significant difference between male and female shooters.

SUMMARY

The research findings from the research work conducted at Barnala, Sangrur and pataila districts only. The purpose of the study was to compare mental imagery of male and female shooting players. In mental imagery there are 6 components visual sensation, auditory sensation, gustatory sensation, olfactory sensation, tactual sensation and organic sensation. The study was conducted on total 60 subjects. In which 30 male and 30 female shooters. The data was recorded on questionnaire and hand steadiness tester. The significance of mean difference and standard deviation between male and female shooters were analyzed by 't' test. The level of significance was set at 0.05 in order to find out the difference between male and female shooters.

CONCLUSIONS

On the basis of the analysis and interpretation of data, within the limitations and delimitations of the study, the following conclusion have been drawn out-

- There is significant difference was found between male and female shooters of visual sensation.
- There is significant difference was found between male and female shooters of auditory sensation.
- No significant difference was observed between male and female shooters of gustatory sensation.
- No significant difference was observed between male and female shooters of olfactory sensation.
- There is significant difference was found between male and female shooters of tactual sensation.
- There is significant difference was found between male and female shooters of organic sensation.

RECOMMENDATIONS

On the basis of the analysis and interpretation of data, within the limitations and delimitations of the study, the following recommendations have been drawn out-

- A similar study should be conducted specifically on air rifle shooters to examine whether the findings remain consistent across different shooting disciplines.
- Future research should focus on elite-level athletes, including those competing at national, international, and Olympic levels, to assess whether mental imagery differences persisted at higher levels of competition.
- A study should be conducted across different age groups to analyze developmental variations in mental imagery among shooters.
- Comparative studies should be extended to other precision-based sports, such as archery, to determine whether similar gender differences existed in mental imagery across related disciplines.

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