

# A Comparative Study of Audio and Visual Reaction Abilities Between Sedentary and Active Male Young Adults

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## ABSTRACT

Reaction time is a crucial determinant of cognitive and motor performance, significantly influencing daily activities and sports. This study aims to compare the auditory and visual reaction times of sedentary and physically active male young adults. The research was conducted at Punjabi University, Patiala, with a total of 40 participants divided into two equal groups: sedentary (n=20) and active (n=20). A random sampling method was employed to ensure an unbiased representation. Reaction times were measured using standardized reaction time apparatus (RT apparatus, Anand agencies, India) for both auditory and visual stimuli. Statistical analysis was performed using an independent t-test, revealing a significant difference in both auditory and visual reaction times between the groups. The auditory reaction time comparison yielded a t-value of 3.0529 and a p-value of 0.0041, while the visual reaction time comparison resulted in a t-value of 2.3647 and a p-value of 0.0233. These results indicate that active individuals have significantly faster reaction times compared to their sedentary counterparts.

**Keywords:** Reaction time, auditory reaction time, visual reaction time, physical activity, sedentary lifestyle, cognitive performance, motor function.

## INTRODUCTION

Reaction time plays a critical role in human performance, particularly in tasks requiring quick responses to stimuli. It is divided into auditory reaction time (ART) and visual reaction time (VRT), which assess an individual's ability to respond to auditory and visual cues, respectively. Physical activity has been shown to influence reaction time, potentially due to improved neuromuscular coordination, cognitive processing speed, and neural efficiency. The present study aims to investigate whether there is a significant difference in ART and VRT between sedentary and physically active young males. By comparing these two groups, the study seeks to contribute to the growing body of research on the cognitive benefits of an active lifestyle.

Several studies have shown that reaction abilities are influenced by factors such as physical activity levels, cognitive engagement, age, and environmental stimuli (Hillman, Erickson, & Kramer, 2008; Tomporowski, 2003).

## METHADODOLOGY

A total of 40 male individuals aged 18-30 years were recruited through random sampling from Punjabi University, Patiala. Participants were divided into two groups based on their activity levels: 20 sedentary individuals and 20 physically active individuals. The classification was based on risk factor portfolio by (Jefery W.Ryg January 2015) with sedentary participants engaging in minimal or no exercise, while active participants engaged in regular physical activity for at least five days a week. Reaction times were measured using a Digital reaction time apparatus (RT apparatus, Anand agencies, India). Participants were exposed to auditory and visual stimuli, and their response times were recorded in milliseconds. Each participant completed three trials, and the best reaction time was used for analysis. Statistical analysis was conducted using an independent t-test to determine significant differences between the two groups.

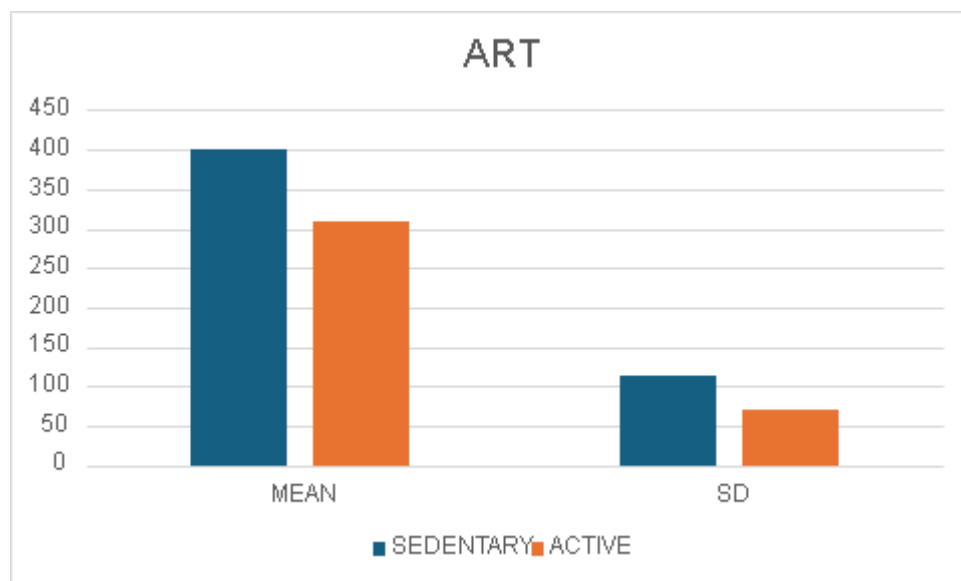
**RESULTS**

The statistical analysis revealed significant differences between the sedentary and active groups in both auditory and visual reaction times. The auditory reaction time comparison yielded a t-value of 3.0529 and a p-value of 0.0041, indicating a significant difference in favor of the active group. Similarly, the visual reaction time comparison produced a t-value of 2.3647 and a p-value of 0.0233, also showing a statistically significant difference. These results suggest that physically active individuals exhibit faster response times to both auditory and visual stimuli compared to sedentary individuals.

**Table-1 ART (auditory reaction time comparison) in milliseconds**

	Sample size	Mean ± SD		
<b>Sedentary</b>	N= 20	401 ± 113	T- value	*P value <0.05
<b>Active</b>	N=20	309 ± 71	3.0529	0.0041

Mean (milliseconds) ± standard deviation, N= Sample size, \*P value <0.05 is significant

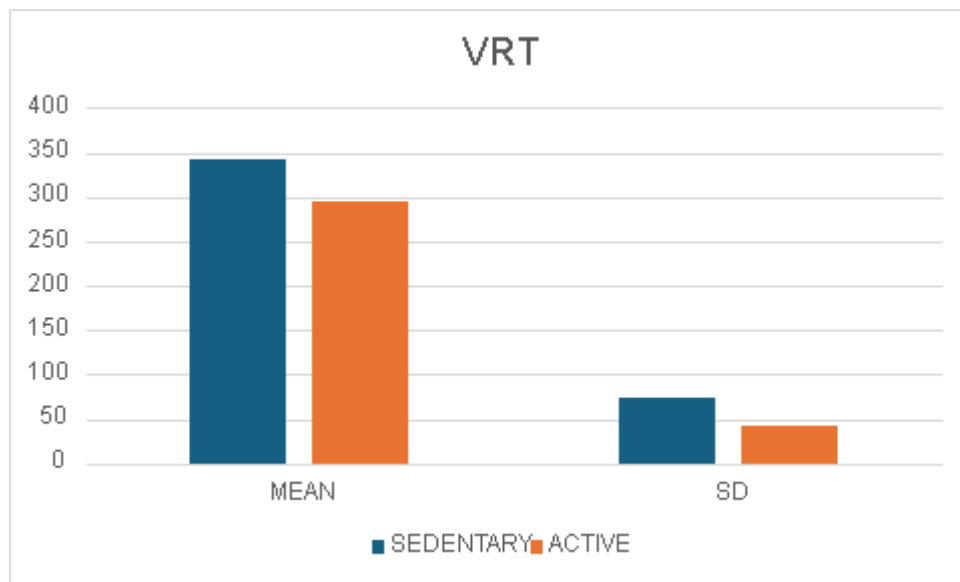


**Graph – 1 representation that shows mean and standard deviation for auditory reaction time in (milliseconds).**

**Table-2 VRT (visual reaction time comparison) in milliseconds**

	Sample size	Mean ± SD		
<b>Sedentary</b>	N= 20	342±74	T- value	*P value <0.05
<b>Active</b>	N=20	296±43	2.3647	0.0233

Mean (milliseconds) ± standard deviation, N= Sample size, \*P value <0.05 is significant



**Graph-2 representation that shows mean and standard deviation for visual reaction time in (milliseconds)**

**DISCUSSION**

The findings of this study align with previous research that suggests physical activity enhances cognitive and motor function. The improved reaction times observed in the active group can be attributed to various physiological and neurological adaptations. Regular physical activity has been shown to enhance synaptic plasticity, increase neurotransmitter efficiency, and improve overall brain function. Additionally, increased cardiovascular fitness may contribute to better oxygenation and nutrient delivery to the brain, further enhancing cognitive processing speed.

The significant differences in reaction times between the two groups emphasize the importance of maintaining an active lifestyle for optimal cognitive and neuromuscular performance. These findings have implications for various fields, including sports science, occupational health, and general well-being. Encouraging regular physical activity could lead to improved reaction times, which may be beneficial in daily life and high-performance activities.

**CONCLUSION**

This study provides evidence that physical activity positively influences auditory and visual reaction times in young males. The results highlight the importance of an active lifestyle in maintaining and enhancing cognitive and motor functions. Future research could explore the effects of different types of physical activities on reaction time, as well as investigate potential gender differences in reaction time improvement.

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