



P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 5.38
IJPESH 2020; 7(5): 300-302
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www.kheljournal.com
Received: 19-05-2020
Accepted: 24-06-2020

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Comparison of the reaction time of male judokas and wrestlers against auditory and audio-visual stimulus

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Abstract

Reaction time is the time taken to react to a stimulus. In cognitive psychology, reaction time (RT) is used to measure the amount of time that it takes an individual to process information. In research studies, reaction time measures have been commonly used to assess the level of alertness of the Judokas and Wrestlers. The results of the research study on the Auditory and Audio-Visual reactions are commonly used for the purpose of evaluating Judo and Wrestling skills. The objective of the study aimed at determining comparison in measurements of the reaction time of male judokas and wrestlers against the auditory signal and audio-visual signal. The sample of the study comprised a group of 32 Male (Judokas and Wrestlers) of age group between 18-23 Years. Two different types of stimuli were employed in research through VTS Machine for the assessment of reaction time (RT) i.e. Auditory Signal and Audio-Visual Signal. T-test was used to compare the Auditory and Audio-Visual Reaction Time. Judokas and Wrestlers were found to React faster against Auditory stimulus.

Keywords: Judokas, wrestlers, audio, audiovisual, and reaction time

Introduction

There is a fire and smoke relationship between stimulus and reaction in Judokas and Wrestlers; as every sensory input in terms of information is reacted accordingly. Reaction time (RT) is a measure of the quickness with which an organism responds to some sort of stimulus. RT is defined as the interval of time between the presentation of the stimulus and appearance of appropriate voluntary response in the subject ^[1].

Human RT works by having a nervous system recognize the stimulus. The neurons then relay the message to the brain. The message then travels from the brain to the spinal cord, which then reaches a person's hands and fingers. The motor neurons then tell the hands and fingers how to react. The degree of alertness in a situation is often judged by the speed with which one responds to that situation. In research studies, reaction time measures have been commonly used to assess the level of alertness of the Judokas and Wrestlers. Abilities, as the psychological construct, are strictly connected with the notion of individual differences which determine the level and quality of the athlete's achievements in a particular area of sports activity. Results of research on the speed of reaction are commonly used for the purpose of evaluating Judo and Wrestling skills. Factors that can affect the average human RT include age, sex, left or right hand, central versus peripheral vision, practice, fatigue, fasting, breathing cycle, personality types, exercise, and intelligence of the subject ^[2].

The research aimed at determining the comparison in measurements of the speed of reaction time of male judokas and wrestlers against auditory signal and audio-visual signals.

Reviews and related literature

Neena Mishra (1985) ^[3] in his study have shown in their comparative study of the visual and auditory reaction time of hands and feet in males and females that there are significant differences between reaction time of hands and feet, right side and left side, males and females and between auditory and visual reaction times (ART & VRT). Both ART and VRT were significantly faster in hands. The delayed response of the left side (LH, LF) was more marked in feet with ART, on crossing hands both VRT and ART took more time in RH. Males responded faster than females, the difference is significant mainly in ART and that too on the

left side. ART was significantly faster than VRT. The faster response of the right side was probably since all subjects were right-handed persons [3]. Jing-Long Wu (1977) [4] have studied human interactive characteristics between visual and auditory systems by psychological experiments and they measured it by functional magnetic resonance imaging (fMRI). They have suggested that the visual reaction time is remarkably affected by the auditory reaction time, however, the auditory reaction time cannot be affected by the visual stimulus when the visual and auditory stimuli are concurrently presented [4].

Many researchers have confirmed that reaction to sound is faster than to light, with mean auditory reaction times being 140-160msec. and visual reaction times being 180-200msec [5, 6, 7, 8, 9]. Laming (1968) [11] concluded that simple reaction time averaged 220 msec, but recognition reaction times averaged 384 msec [11].

Froeborg (1907) [12] found that the visual stimuli that are longer in duration elicit faster reaction times and similar results were found by Wells for auditory stimuli [12].

Several investigations have suggested that the brain's visual system contains two separate neural pathways, each originating in primary visual centers at the back of the head and taking its route to the frontal lobe. Researchers say that a 'what' pathway discerns the identity of objects, while a 'where

'pathway locates objects in space. Two distinct neural pathways run from auditory brain tissue near that ear to the frontal lobe locates /locales favored by the two visual pathways [13].

Methods and Materials

A total of 32 Judokas and wrestlers were taken in this study from LNIPE, Gwalior, and reaction tests were conducted upon the subjects by using the Vienna Test System (VTS).

The Reaction test consists of two aspects one is Reaction test with Auditory Signal and the Second is the Reaction Test with Audio-Visual signal. The duration of the test was around 8 minutes and it gave a self-made record of the result in percentile and t score. The percentile score of Judokas and wrestlers was used for comparing the Auditory and Audio-Visual Reaction time.

The T-test is used for the comparison between Auditory and Audio-Visual Reaction Time.

Statistical Technique

t-Test was applied using SPSS 20.

Level of significance 0.05

Results & Discussion

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	audio	36.3750	32	15.53923	2.74697
	audio visual	48.0000	32	12.79113	2.26117

Paired Samples Test

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	audio - audio visual	-11.62500	18.97664	3.35463	-18.46681	-4.78319	-3.465	31	.002

A total of 32 samples combining judokas and wrestlers were given auditory stimulus followed by the audio-visual stimulus. Results depicted mean score of an auditory signal as 36.37 msec with standard error 2.74 and mean score of an audio-visual signal as 48.00 msec with standard error 2.26 and two-tailed test i.e $p=0.002$, hence this test is found to be significant at 0.05

Conclusions

Results have shown a significant difference in the Reaction time between the Auditory Signal and Audio-visual signal, which means that judokas and wrestlers have shown better reaction time to the auditory stimulus when compared with Audio-Visual stimulus.

Discussion

Results of the study were supported by the researchers who have confirmed that reaction to sound is faster than light with mean auditory reaction times being 140-160msec and visual reaction times being 180-200msec [5, 6, 7, 8, 9]. Also, Laming (1968) [11] stated that simple reaction time averaged 220 msec, but recognition reaction times averaged 384 msec [12]. Which supports auditory reaction time is faster than the audio-visual reaction time. So, based on these results it is concluded that in combative games like judo and wrestling auditory stimulus is more important than audio-visual stimulus. And this study fills the gap of knowledge that Judo and Wrestling are based on visual stimuli even though auditory reaction time of judokas and wrestlers is found to better than the audio-visual

reaction time.

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