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Impact of Yogic Relaxation Technique on Reaction Time of Gamers and Music listeners

Lopamudra Naik
Department Of Psychology, Kristu Jayanti College Autonomous Bengaluru

Abstract: ***In recent times social craze of playing video games and listening to music online have been increasing and it's impact on reaction time have been an area of interest for numerous researchers. The current study was conducted to examine the effect of yogic deep relaxation technique on the Visual and Auditory Reaction Times of Gamers and Non Gamers as well as music listeners and non listeners . The study was conducted on 115 participants, both males and females, aged between 20 to 50 years . The auditory reaction time (ART) and visual reaction time (VRT) of the participants was measured using Simple ART and Simple VRT tests conducted using Inquisit software and the statistical analysis was conducted using JASP software . A paired sample t-test was conducted to compare Auditory Reaction Time in 52 music listeners and 54 non-listeners before and after intervention and the results suggested that there was no significant improvement in the ART of people who listen to music more time per day, immediately after the practice of yogic relaxation technique. Whereas there was a significant improvement in the ART of people who spend less time in listening to music, immediately after the practice of deep relaxation technique also there was no significant improvement in the VRT of people who play video games more time per day, immediately after the intervention. Whereas there was a significant improvement in the VRT of people who spend less time in playing video games post intervention.***

Keywords: Yoga, Gamers, Music Listeners, Auditory Reaction Time, Visual Reaction Time , Deep Relaxation Technique

I. INTRODUCTION

Speed is an important aspect of life in many day to day activities. In various psychological and scientific researches different Reaction Time Tasks have been used to measure one's speed in terms of milliseconds. Conducting Reaction time experiments have been a subject of interest of many psychologists since the middle of the nineteenth century [1]. Numerous appropriate trainings have been developed to improve Reaction Times across various populations and age groups. There are many different types of RT- simple, recognition, choice, serial etc.[2] . In the present study the researcher conducted simple visual and auditory reaction time experiments where there is only one stimulus and one response .

In the current era a social craze of playing video games and listening to music online have been increasing [3],[4]. It has also been found that playing modern video games require a large amount of attention and faster RT to operate and act successfully through the virtual environments [5]. In recent time Real-Time Strategy games (RTS) which are a genre of computer and video games have been largely popularized . These video games are fundamentally about making decisions and exercising skills which can have an impact on the reaction time of individuals [6] .

Games can be seen as forms of interactive narratives, procedural stories or even as remediated cinema [7] . The various aspects of gaming involves complex mental functioning like dynamic combination and distribution of data , the registers, the necessary manipulation of temporal, causal, spatial and functional relations and properties also the gamers simultaneously needs to keep in mind the rules and the goals of the video game they are playing [8] . Many researches have been conducted to compare RT between gamers and non gamers. Some of the previous studies also show that video gaming players have better attention, information processing and performance as compared to non video game players [3]. Also researchers state that the use of simulations and digital games in learning and assessment is expected to increase over the next several years[9] . Video game players perform better than non-video game players on measures of basic attention and performance [10] . Playing onlie video games can thus have an effect on an individual's visual reaction time .As visual reaction time can be attributed as the time taken to respond to the sudden appearance or change of a visual stimulus which often involves pressing buttons, taking a quick descision and responding to a visual stimuli .

Even humans have been inquisitive to study various intellectual benefits of listening to music . These is also an increasing trend in listening to music by individuals while exercising, doing household works, at workplaces also some individuals indulge in listening to music even while communicating with others [11].

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In today's era it can also be observed that individuals are often involved in multi-tasking, switching between household chores and professional engagements while listen to the sound of music . In recent times individuals have started listening to music more often and there have been a drastic increase in the number of subscribers of audio streaming services and also the time individuals spend listening to music online have grown drastically across platforms as per Blaise Fernandes, president and chief executive officer of Indian Music Industry, the apex body of music companies and record labels. Listing to music in a long term basis can have an impact on an individual's auditory reaction time [12] . As auditory reaction time is often referred to as the time required to respond to auditory stimuli and listening to music have been found to have an influence on auditory reaction time of individuals. Also different preferences of music of different individuals have also been found to have an impact on individual's reaction time [13]. It has also been found that music listeners, though short term, have better performance on a variety of cognitive tests as compared to non-listeners [14] . Also listening to music on the radio has an impact on Reaction Time [15] , [16]. It has been found that listening to arousing techno music shortens RT [17]. Also studies have been conducted to study the effect of different volumes of music on reaction times [18], [19] .

As it has been studied that in simple terms reaction time is referred to the time interval between the application of a stimuli and the appearance of appropriate voluntary response by an individual and it can be used to assess the individual's efficacy to respond to any stimulus in daily life, choice of music and its influence on the central nervous system and hence reaction time has been linked to many neurophysiological reactions [20].

Yoga comes from the root word "yoke" which means to "unite" to bind to "link" to connect or to "merge". As yoke joins two bulls together, the yoga unites body and mind together. Thus the merging of the individual soul with the universal consciousness and the experience of merging with the universal consciousness is yoga. It is possible through sense control and continued practice and detachment to achieve this experience [21]. There are many formal definitions of yoga where yoga can be seen as a technique of austerity , as a method of meditation , or as a technique of concentration and uniting the body and mind and disciplining the body by physical exercises to discipline the common-sense . Also there are different definitions of yoga and its meaning for different practitioners according to their understanding and experience , and also some practitioners associate yoga with different religions, practitioners often try to define yoga according to their own understanding [22].

Yoga being the science of physical and mental control [21]. The purpose of the study was to examine the effect of yogic deep relaxation technique on the Visual and Auditory Reaction Times of Gamers and Non Gamers as well as music listeners and non listeners. As meditation and yoga have been researched in improving operating frequencies of human mind and body [23] .

II. METHOD

After obtaining informed consent from the participants, the intervention was conducted to study the Auditory and Visual Reaction Times in participants before and after a yogic relaxation technique . 115 participants aged between 20 to 50 years were selected for the study residing at Brajrajnagar, Odisha . Healthy subjects, without any hearing or visual disorder, participants not having any neurological illness, any acute illness, having normal hearing ability, non-smokers were included in the study . Participants having any hearing impairment, any organic disease of ear and nose, chronic illness, participants taking any kind of drugs, participants involved in any athletic training program were kept as an exclusion criteria.

Deep Relaxation Technique (DRT) which is a form of Yogic Relaxation Technique developed at Swami Vivekananda Yoga Anusandhana Samstha, Bengaluru was given for 10 minutes as an intervention. The visual reaction time of gamers and auditory reaction time of music listeners was recorded in pre-intervention and post intervention period . In visual reaction time group participants playing video games more than 60 minutes per day were segregated as gamers and participants playing video games less than 60 minutes per day were segregated as non-gamers. In auditory reaction time group participants listening to music more than 60 minutes per day were segregated as listeners and participants listening to music less than 60 minutes per day were segregated as non-listeners. In visual reaction time group 50 participants were identified as gamers and 58 participants as non-gamers . In auditory reaction time group 52 participants were identified as music listeners and 54 as non-listeners .

For assessment Simple ART and Simple VRT tests were conducted using Inquisit software. The data generated in visual and auditory summary files of Inquisit software (iqdat file extension) was transformed to Microsoft Excel (xlsx file extension) document. The transformed data contained the Pre and Post values for the variables mean, median, minimum latency, maximum latency, and standard deviation for Auditory and Visual reaction times of the participants. Excel document was converted to CSV format and used in JASP software for performing statistical analysis. The mean value of all 40 attempts of each participant of ART and VRT were considered for further analysis. ART and VRT data were collected in Pre DRT condition and immediately in Post DRT condition of 115 participants.

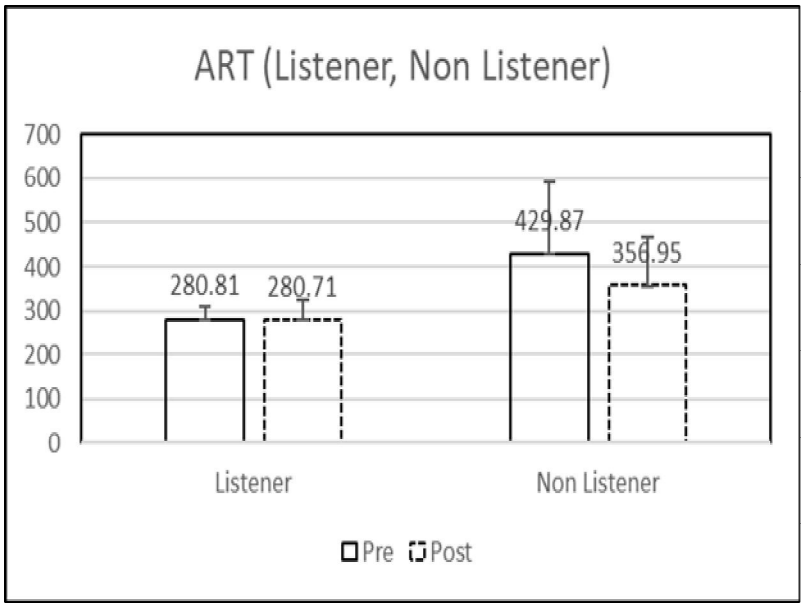
III.RESULTS AND DISCUSSION

A paired sample t-test was conducted to compare Auditory Reaction Time in 52 listeners and 54 non-listeners in Pre-DRT and in Post-DRT condition.

TABLE 1

ART (Listener, Non-Listener)												
	N	Pre			Post			Δ%		t	p	Cohen's d
		Mean	S.D	S.E	Mean	S.D	S.E	Mean	S.D			
Listener	52	280.81	30.68	4.26	280.71	42.97	5.96	0.04	-40.04	0.02	0.984	0.003
Non-Listener	54	429.87	162.67	22.14	356.95	110.38	15.02	16.96	32.15	3.341	0.002	0.455

GRAPH 1



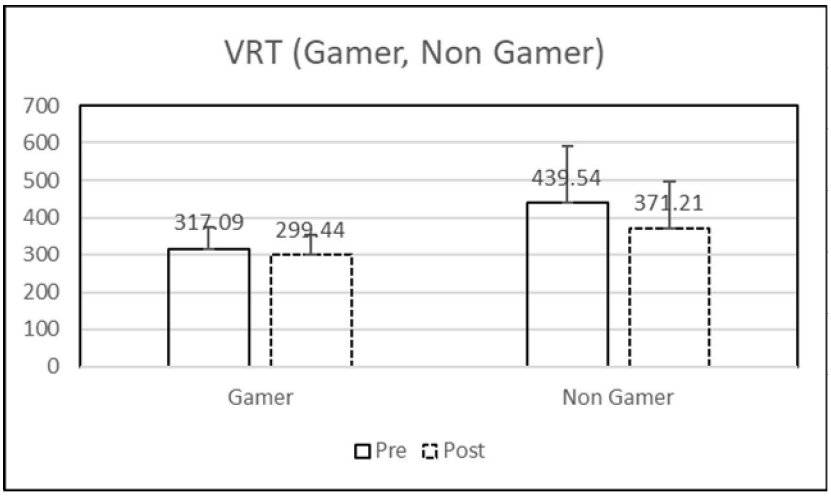
Results presented in Table 1 and graph 1 shows that in music listeners there was no significant difference in the score for Pre-DRT (M=280.81, SD=30.68) and Post-DRT (M=280.71, SD=42.97) condition; p=0.984, t=0.02, d=0.003. In non-listeners there was a significant difference in the score for PreDRT (M=429.87, SD=162.67) and Post-DRT (M=356.95, SD=110.38); p=0.002, t=3.341, d=0.455. These results suggest that there is no significant improvement in the ART of people who listen to music more time per day, immediately after the practice of DRT. Whereas there is a significant improvement in the ART of people who spend less time in listening to music, immediately after the practice of deep relaxation technique .

To compare VRT in 50 gamers and 58 non-gamers in Pre-DRT and in Post-DRT condition again a paired sample t-test was conducted.

TABLE 2

VRT (Gamer, Non-Gamer)												
	N	Pre			Post			Δ%		t	p	Cohen's d
		Mean	S.D	S.E	Mean	S.D	S.E	Mean	S.D			
Gamer	50	317.09	58.17	8.23	299.44	55.87	7.90	-31.47	3.96	1.842	0.072	0.261
Non-Gamer	58	439.54	152.62	20.04	371.21	126.87	16.66	15.55	16.87	4.025	$1.701e^{-4}$	0.528

GRAPH 2



Results presented in Table 2 and graph 2 indicates that in gamers there was no significant difference in the score for Pre-DRT (M=317.09, SD=58.17) and Post-DRT (M=299.44, SD=55.87) condition; p=0.072, t=1.842, d=0.261. In non-gamers there was a significant difference in the score for PreDRT (M=439.54, SD=152.62) and Post-DRT (M=371.21, SD=126.87); p=1.701e-4, t=4.025, d=0.528. These results suggest that there is no significant improvement in the VRT of people who play video games more time per day, immediately after the practice of DRT. Whereas there is a significant improvement in the VRT of people who spend less time in playing video games, immediately after the practice of DRT.

IV. CONCLUSIONS

In the present study it was observed that those individuals who listened to music more than 60 minutes per day had no significant improvement in auditory reaction time after doing the yogic relaxation technique . Whereas, those who didn't used to listen more music per day had significant improvement in auditory reaction time. In case of visual reaction time it was observed that individuals who play video games more than 60 minutes per day didn't show any significant improvement immediately after the practice of deep relaxation technique . Whereas, those who don't play video games very often showed significant improvement in VRT (p=1.701e-4) immediately after the intervention.

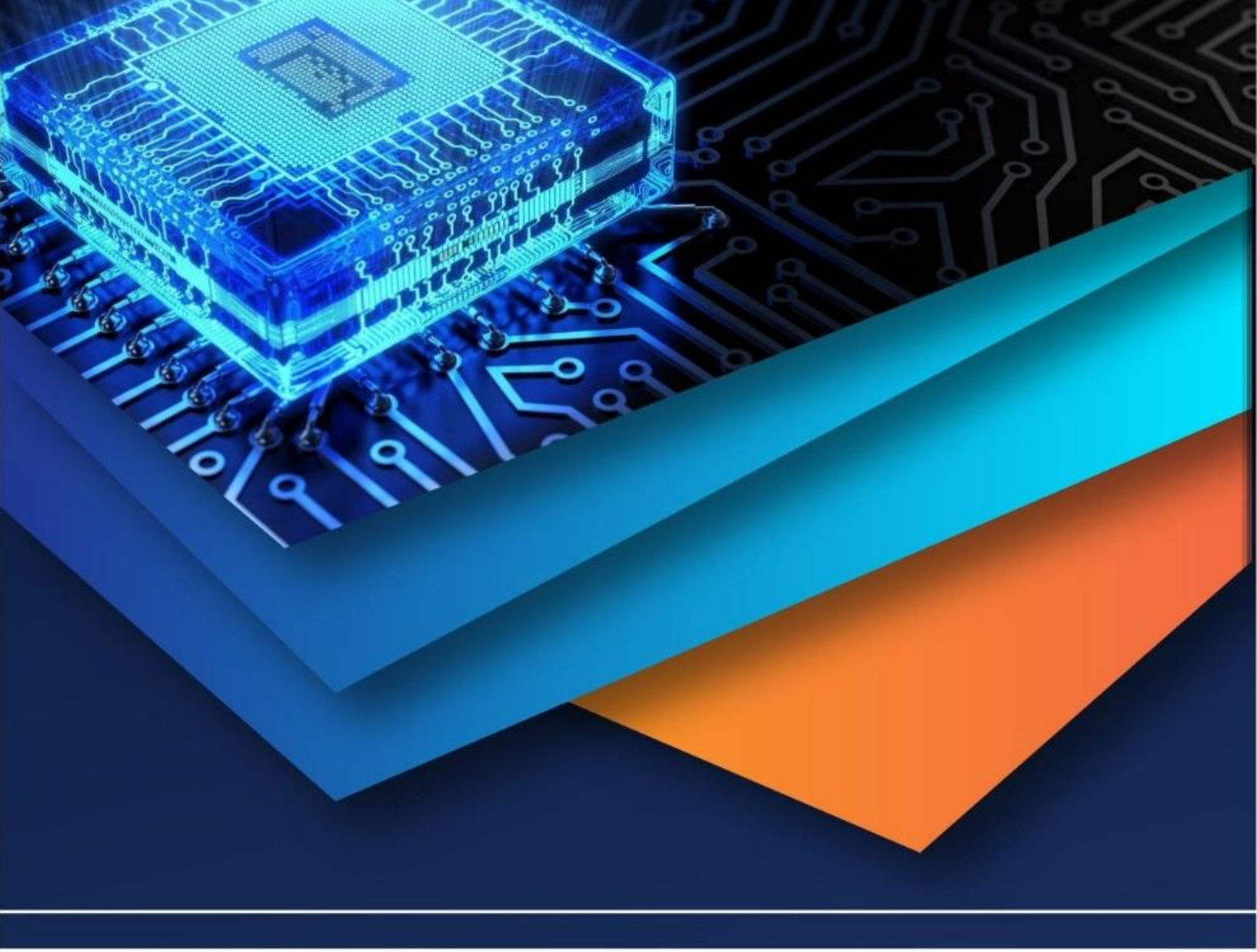
The short duration of intervention is one of the limitations of the study. In future more studies can be conducted by increasing the duration of intervention and taking more sample size . This can be extended to the field of sports, race driving where having a fast or short Reaction Time is required.

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