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EXTENDED ABSTRACT

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IMPACT OF PLAYING VIDEO GAME TOWARDS COGNITIVE CONTROL AND REACTION TIMES

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I. Introduction

This study examines the impact of extensive video game playing on cognitive control and visuomotor performance. By analyzing reaction times and accuracy, it sheds light on the differences between video game players (VGPs) and non-video game players (non-VGPs), thus addressing gaps in understanding Simon-task performance and its implications for visuomotor and cognitive abilities [1].

II. Methods

A causal-comparative design was employed to analyze cognitive control and visuomotor performance in male participants (n = 30, 18–25 years) with normal vision and right-handedness. Using tools within Psytoolkit (PsychologyJobs.com), tests such as the Simon-task and Aim Trainer were utilized to assess reaction times and accuracy. Participants were grouped into VGPs (n = 15, 3+ days/week gaming) and NVGPs (n = 15, minimal gaming), matched for demographics, and tested under controlled conditions. Data was analyzed using the Mann-Whitney U Test with statistical significance set at (p<0.05) to seek any possible differences between groups.

III. Results and Discussion

A. Reaction Time

VGPs exhibited significantly faster reaction times than NVGPs, with averages of 441ms (congruent) and 458ms (incongruent), compared to 503ms and 897ms for NVGPs. The pronounced reduction in the Simon effect among VGPs highlights their superior cognitive control, as evidenced by the smaller disparity between congruent and incongruent trials. A Mann-Whitney U test revealed a significant difference in the reaction times levels of VGP (Md = 16, n = 13) and NVGP (Md = 385, n = 13), U = 0.001, z = -4.334, p<0.001, r = 1.20. The finding indicates that video games do affect the time taken for the brain to make decisions [2].

TABLE I
RANKS AND TEST STATISTICS OF REACTION TIMES

	Group	*n*	Rank	Sum
RT	NGV	13	7	91
	NGVP	13	20	260
	Total	26		

TABLE III
RANKS AND TEST STATISTICS OF REACTION TIMES

	RT
Mann-Whitney U	91
z	-4.33
Asymp. Sig. (2-tailed)	*< 0.001
Exact Sig. [2*(1-tailed Sig.)]	*< 0.001

*p < 0.001

B. Accuracy

VGPs also displayed notably higher accuracy rates, exceeding 90%, compared to NVGPs, who achieved only 60–75%. This substantial difference was consistent across all task types, emphasizing the enhanced visuomotor precision of VGPs and their ability to adapt to demanding cognitive tasks more effectively than NVGPs. A Mann-Whitney U test revealed a significant difference in the accuracy levels of VGP (Md = 92, n = 13) and NVGP (Md = 70, n = 13), U = 0.001, z = -4.345, p < 0.001, r = 1.20. Always tinkering with the cognitive effort sharpened the mind, thus reducing the tendency to get inaccurate results[1,2].

IV. Conclusions

This study reveals that extensive video game playing enhances cognitive control and visuomotor performance. VGPs exhibit faster reaction times, reduced Simon effect, and superior accuracy compared to NVGPs. These findings suggest that action video gaming could improve cognitive adaptability and visuomotor precision, with potential applications in training and skill development.

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