

INTERNATIONAL GRADUATE COLLOQUIUM

i-SPEAK **2026**

**SPORTS AND PHYSICAL EXERCISE
ASSEMBLY OF KNOWLEDGE SHARING**

SERIES 1. 2026

COLLOQUIUM PROCEEDINGS

EXTENDED ABSTRACT



Malaysia, 10 February 2026



eISBN 978-629-7989-01-3



Differences in Attention Abilities Between Action Video Game Players and Non-Players

Nurain Farhanah Saiful Azli¹, Raja Nurul Jannat Raja Hussain¹, Muhamad Noor Mohamed¹,
Muhamad Safiq Saiful Annur¹, Maisarah Shari², & Noor Azila Azreen Md Radzi^{1*}

¹Faculty of Sports Science and Recreation, Universiti Teknologi Mara, Seremban Campus, Negeri Sembilan, MALAYSIA

²Faculty of Sports Science and Recreation, Universiti Teknologi MARA Shah Alam, Malaysia

*Corresponding author: azila_azreen7172@uitm.edu.my

Keywords: Action Video Games, Sustained Attention, Executive Function, Trail Making Test, Cognitive Performance

I. INTRODUCTION

Action video games (AVGs), such as first-person shooter (FPS) and multiplayer online battle arena (MOBA) games, are fast-paced and cognitively demanding. They require players to process multiple visual stimuli, make rapid decisions, and switch tasks efficiently. Previous studies [1][2] suggest that AVG players may outperform non-players in visual attention, selective attention, and information processing speed. However, existing findings on the cognitive effects of action video games remain inconsistent, and empirical studies directly comparing attention performance between action video game players and non-players remain limited [2][3]. Therefore, this study aimed to compare sustained attention and executive function between male AVG players and non-players among university students using the Trail Making Test (TMT).

II. METHODS

A total of 42 male university students aged 18 to 25 years from Universiti Teknologi MARA (UiTM) Seremban 3 were recruited for this study. The sample consisted of gamers ($n = 21$) and non-gamers ($n = 21$), selected through purposive sampling based on predefined inclusion and exclusion criteria. Participants were required to be healthy and free from neurological disorders. Gamers were required to play FPS or MOBA games, such as Mobile Legends or PUBG, for at least one hour per week, while non-gamers had no regular exposure to action video games. Sustained attention and executive function were assessed using the Trail Making Test Part A (TMT-A) and Part B (TMT-B), respectively. Completion time in seconds was recorded, with lower scores representing better performance. All participants volunteered, provided informed consent, and were allowed to withdraw from the study at any time. Data were analysed using an independent t-test in SPSS, with significance set at $p < 0.05$.

III. RESULTS AND DISCUSSION

The results indicated that action video game players performed significantly better than non-players on both attention tasks. Gamers took significantly less time to complete both TMT-A and TMT-B compared with non-gamers ($p < 0.05$),

indicating better sustained attention and executive function. As shown in Fig. 1, gamers demonstrated better performance in tasks measuring sustained attention (TMT-A) and executive function (TMT-B).

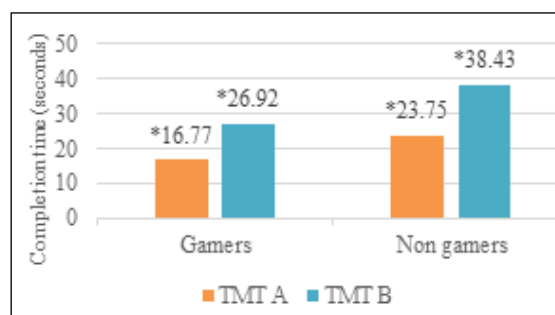


Fig. 1. Mean completion time (seconds) for TMT-A and TMT-B between gamers and non-gamers (* $p < 0.05$).

Gamers had a mean completion time of 16.77 s ($SD = 1.84$) on TMT-A compared with 26.92 s ($SD = 1.66$) for non-gamers. On TMT-B, gamers completed the task in 23.75 s ($SD = 2.14$), whereas non-gamers took 38.43 s ($SD = 2.27$), indicating enhanced sustained attention and executive function among action video game players.

The better performance of gamers in TMT-A and TMT-B can be explained by the fast-paced and cognitively challenging nature of action video games. These games require players to remain focused on multiple visual stimuli and switch tasks efficiently, which directly trains sustained attention and executive function. Previous research has reported that habitual gamers may show enhanced attentional resources and improved task-switching abilities compared with non-gamers [1][2][4]. The difference may be attributed to non-gamers having less exposure to fast-moving visual stimuli and cognitively demanding environments requiring sustained attention and executive function, which are commonly trained through action video game play [1][4].

IV. CONCLUSIONS

The results showed that male action video game players performed significantly better than non-action video game players in sustained attention and executive function. The findings suggest that action

Malaysia, 10 February 2026

video gaming may provide cognitive benefits for players. Future studies should include participants from different age groups, genders, and game genres to improve generalisability.

ACKNOWLEDGMENT

The author would like to express sincere gratitude to Allah for giving the opportunity to complete this research. Special thanks are extended to the supervisor, Noor Azila Azreen Md Radzi, for her guidance and support throughout the study. The author also thanks family, friends, and participants for their encouragement and cooperation. Appreciation is also extended to Universiti Teknologi

MARA (UiTM) for providing a conducive learning environment.

REFERENCES

- [1] Green, C. S., & Bavelier, D. (2003). Action video game modifies visual selective attention. *Nature*, 423(6939), 534–537.
- [2] Boot, W. R., Kramer, A. F., Simons, D. J., Fabiani, M., & Gratton, G. (2008). The effects of video game playing on attention, memory, and executive control. *Acta Psychologica*, 129(3), 387–398.
- [3] Jiwal, J., & Indian, J. (2019). Original Article Impact of Playing Action and Puzzle Video-games on Attention and Executive Function: A Comparative Study. *J Physiol Pharmacol*, 63(2).
- [4] Dye, M. W. G., Green, C. S., & Bavelier, D. (2009). The development of attention skills in action video game players. *Neuropsychologia*, 47(8-9), 1780–1789.