Assessing the Physiological Cost and Intrinsic Motivation of Multiplayer versus Single Player Active Videogames in Young Healthy Males

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Introduction

- Almost one third of 2 to 15 year olds are overweight in the UK [1].
- Within the UK, video games are played for over 12 hours per week [2].
- Active videogames (AVGs) may have the potential to be used to increase physical activity levels of individuals, used in combination with other sources of activity [3].

Aims

1) To assess the physiological cost of AVGs in a multiplayer mode, in comparison to single player.
2) To assess intrinsic motivation of participants during each game mode.

Method

Single Player N=19 (age, 23 ± 3 years; stature, 178 ± 6 cm; body mass, 79 ± 15 kg)

Multiplayer N=18 (age, 24 ± 5 years; stature, 180 ± 7 cm; body mass, 81 ± 13 kg)

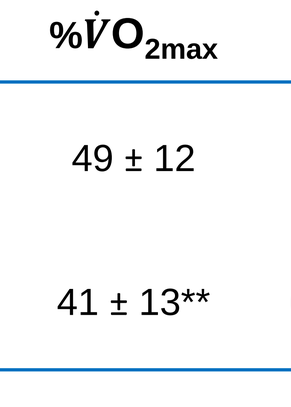
→ $\dot{V}O_{2max}$ test

→ One exergaming session (Single player only)

→ Two exergaming sessions (Single and Multiplayer)

→ Heart rate (HR) and oxygen uptake ($\dot{V}O_{2}$) recorded continuously. RPE taken every 3 minutes. Energy Expenditure (METs) calculated. Flow State Scale (FSS) administered after each game mode.

AVGs



Reflex Ridge

Boxing

River Rush

Results

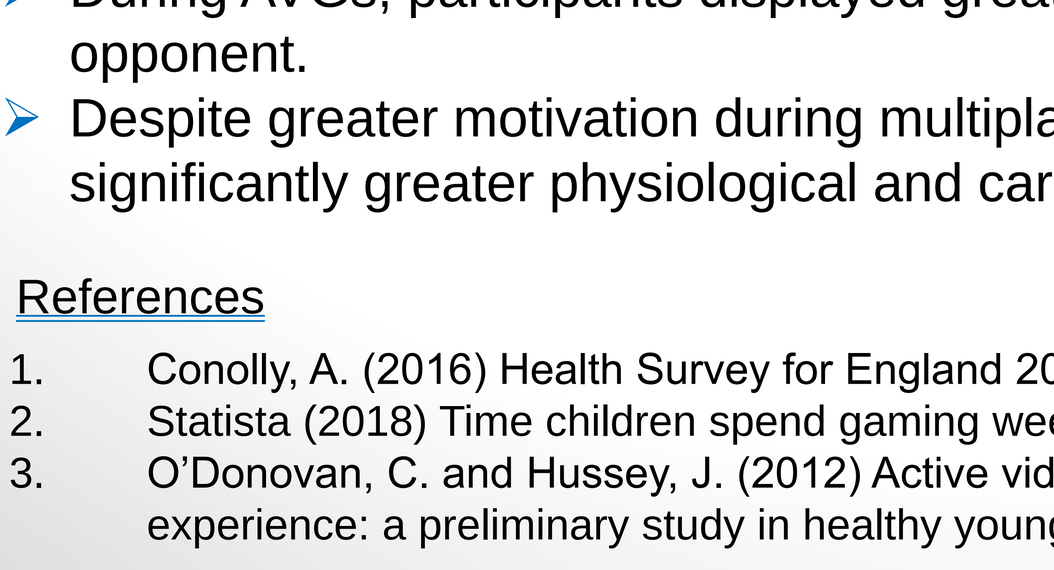


Figure 1. Flow scoring during AVGs between single player gaming (N=19) and multiplayer gaming (N=18).
* $p \leq 0.05$, ** $p \leq 0.01$

Table 1. Average physiological and subjective data for AVGs between single (N=19) and multiplayer (N=18) gaming

	RPE	%HR_{max}	%$\dot{V}O_{2max}$	METs
Single Player	12 ± 1	68 ± 9	49 ± 12	7 ± 2
Multiplayer	11 ± 2**	62 ± 8**	41 ± 13**	6 ± 1**

* $p \leq 0.05$, ** $p \leq 0.01$

Conclusion

- During AVGs, participants displayed greater motivation whilst playing with a human opponent.
- Despite greater motivation during multiplayer gaming, single player gaming showed significantly greater physiological and cardiorespiratory responses.

References

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2. Statista (2018) Time children spend gaming weekly in the United Kingdom (UK) 2013-2017, by age.
3. O'Donovan, C. and Hussey, J. (2012) Active video games as a form of exercise and the effect of gaming experience: a preliminary study in healthy young adults. *Physiotherapy,* **98**(3), 205-210.

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