Reaction Times Differences in Video Game and Non Video Game Players

CENTRAL WASHINGTON UNIVERSITY

Richardson, Benjamin; Ellis, Derek; Greenwald, Ralf (Faculty Advisor), Celori, Anthony; Cherry, Jessica; Meador, Camille
Department of Psychology, Central Washington University, Ellensburg, Washington

Introduction

Modern video games require a large amount of attention and working memory resources to successfully maneuver through virtual environments. Previous research has demonstrated video game players outperform non-video game players on measures of basic attention and performance (Boot et al., 2008). A gamer is defined as an individual who played 4+ hours of video games a week (Green & Bavelier, 2007). Additional analysis evaluated group differences between male and female participants. Results indicate significant group differences between individuals meeting criteria for video game player status and non-gamers, but no group differences between male and female.

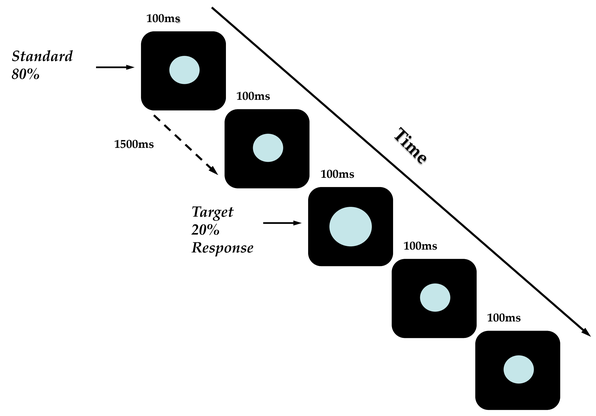
Research Hypothesis

The aim of this study was to examine the differences in types of reaction time to a visual oddball stimulus between gamers and non gamers as well as males and females. Data was recorded as preliminary research for a further investigation of video game related differences using ERP data. We hypothesized that gamers would record statistically significantly lower reaction times compared to non-gamers. We additionally planned on analyzing data examining differences that may be associated with gender but had no directional hypothesis regarding these differences.

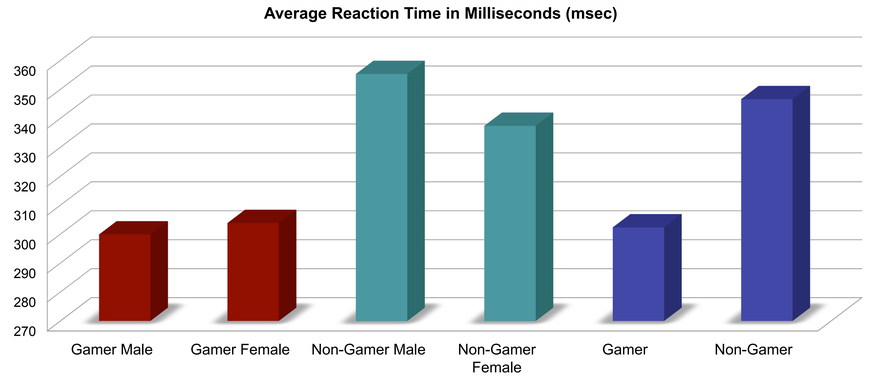
Methods

- Participants: Eighty seven neurologically healthy (aged 18 - 40 years) individuals (45 females, 42 male).
- Stimuli: visual odd-ball detection task (see Figure 1):
- Measures: Reaction time to visual stimulus (oddball condition) recorded from a mouse click reaction to non-frequently occurring stimulus.
- Other factors examined: videogame experience and participant gender.
- Concerns noted with videogame like measures tended to be involved with overly complex series of images which would potentially overtax visual working memory (McPherson & Burns, 2008) which can be easily adjusted by simplifying the visual stimuli to prevent a floor effect.

Figure 1: Visual Odd-ball Task



Mean Reaction Time Scores



Means and Standard Deviations

Table 1

Means and Standard Deviations for Participant Reaction Time

	M	*SD*
Gamer	301.836*	10.207
Non-Gamer	346.326*	5.595
Gamer Male	299.856	16.062
Gamer Female	303.816	12.600
Non-Gamer Male	355.280	7.791
Non-Gamer Female	337.372	8.031

* Indicates statistical significant differences at $p < .05$.

Conclusions

Differences Between Groups

- Differences in reaction times were statistically significant for the main effect of Gamer Status at [*F (1,83)* = 14.609, $p < .001$, *partial eta - .15*]
- Interaction between gamer status and participant gender was non significant [*F (1,83)* = .882, $p = .350$ *partial eta* = .011].
- Main effect of participant gender was also non-significant [*F (1,83)* = .359, $p = .551$, *partial eta* = .004].

Data demonstrates regardless of the participant's gender reaction times on a visual oddball task are statistically shorter for individuals that play 4+ hours of video games per week as previously defined by Green and Bavelier (2007). Lack of differences between male and female gamers indicate both gender groups performed equally quickly. The statistical difference observed between gamer and non-gamer groups confirms the original hypothesis that individuals qualifying as gamers would record significantly lower reaction times than non-gamers and provide further support hypothesizing visual processing is enhanced in gamers.

References

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