Impaired Proactive Cognitive Control in Action Video Game Players

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BACKGROUND
• Experience with action video games has been shown to improve various facets of visual cognition (for a review see Achtman, Green & Bavelier, 2008)
• However, research on action video games’ impact on cognitive control has been mixed. For example:
  - AVGPs compared to NVGPs have impaired proactive cognitive control (Bailey et al., 2009)
  - AVGPs are equally susceptible to dual-task costs as NVGPs (Donohue et al., 2012)
  - AVGPs show smaller task-switching costs than NVGPs (Colzato et al., 2010)

AIMS
The current study sought to:
• Replicate the finding of impaired proactive cognitive control in AVGPs using the Stroop task
• Extend these findings by investigating whether individual differences in the degree of impairment to cognitive control can be predicted by hours of action video game play

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STROOP TASK
Proactive Cognitive Control:

- BLUE
- GREEN
- YELLOW
- RED

Congruent-Incongruent RT = Incongruent-Incongruent RT

Reactive Cognitive Control:

- RED

Incongruent RT = Congruent RT

RESULTS

PARTICIPANTS
29 Action Video Game Players (AVGPs)
• Average of 13.5 hrs/week of action gaming (SD=6.5)
29 Non Video Game Players (NVGPs)
• Average of .09 hrs/week of action gaming (SD=.23)

Figure 1. A significant group x condition interaction (p<.05), demonstrating decreased proactive cognitive control in AVGPs compared to NVGPs.

Figure 2. A significant negative correlation between gaming hours and proactive control (R = -.288, p < .05). The red marker represents mean proactive control for individuals reporting zero hrs/week, which approximates the y-intercept of the correlation.

Figure 3. No significant group differences for reactive cognitive control.

CONCLUSIONS
• The current study replicated a previous finding of impaired proactive cognitive control in AVGPs compared to NVGPs
• We found a significant negative correlation between action hrs/week and proactive control
• Although action video games may afford some visual cognitive enhancements, there may also be some costs incurred by extensive action gaming

REFERENCES