James Harbour

Mrs. Dalton

Honors English 10/3

10 May 19

Fight or Flight

Six years ago, I took an IQ test. My psychologist confided in my parents about my results saying that my processing speed was abnormally bad, and that this inadequacy would affect me my entire life. It was around this time that I began playing Counter-Strike: Global Offensive, a competitive first-person shooter. At this time, my reaction time averaged an abysmal 372 milliseconds. Five years and five-thousand hours later, I was ranked in the 99.25th percentile of players and my reaction time averaged and continues to average around 220 milliseconds. While this improvement is anecdotal, it is not isolated, as esteemed cognitive researcher Daphne Bavelier states in her TED talk on the subject, “action video games have a number of ingredients that are actually really powerful for brain plasticity, learning, attention, vision, etc.” However, society today refuses to reap these benefits as most socially acceptable forms of entertainment promote passivity and indecision. First, let me explain the specifics of this problem.

To many people, action video games seem pointless and unnecessary; however this is due to much of the nation’s population finding satisfaction in the validity of biased statements about controversial issues, creating surges of empirically unfounded beliefs. Daphne Bavelier’s aforementioned TED talk explains this sentiment: ”’Oh, come on, can’t you do something more intelligent than shooting at zombies?’ I’d like to put this kind of knee-jerk reaction in...

context...There's not one week that goes without some major headlines about whether video games are good or bad for you, right?...I'd like to put this kind of Friday night bar discussion aside and get you to actually step into the lab."

To introduce the first area of improvement, consider the massive amount of effort required to switch from doing calculus homework to writing a literary essay. When people require less effort than usual to switch tasks, we say that they have greater cognitive flexibility. The link to violent video games comes from findings in an experiment lead by Lorenza Colzato and his colleagues at the Cognitive Psychology Unit and Leiden Institute for Brain and Cognition indicate that "video game experience is associated with cognitive flexibility...[video game players] showed smaller switching costs than [non video game players], suggesting that they have better cognitive control skills." This experiment's procedure also accounted for differences in age and IQ, and thus allows the generalization of his results. Thus, action videogames present a concrete strategy for training the elderly "to compensate for losses in their ability to adapt and restructure the cognitive system in response to changing situational demands – a skill that is essential for almost all 'functional' everyday behavior" (2-3). These results are not singular either, as there are hundreds of new experiments displaying the same results as Colzato. Shifting to the results about vision improvement, a joint experiment by C.S. Green, a researcher at the University of Rochester's Department of Brain and Cognitive Sciences, and the aforementioned Daphne Bavelier concluded that "action video game play enhances subjects' ability in two tasks thought to indicate number of objects [apprehendable] at a given time." After the initial experiment, follow up analysis was performed in the form of a control experiment for the effect of confounding by instantaneous improvement in tracking. The combination of these two experiments establishes causation for

playing action video games enhancing the number of objects that can be apprehended and ”suggests that this enhancement is mediated by changes in visual short-term memory skills” (1). These skills again counter the passivity of usual modern entertainment by indirectly benefiting brain function. The above results are constrained to specific tasks which we say indicate cognitive ability, but with the more complex methods of analysis developed in recent years we are able to draw more concrete conclusions. In a publication presented at the 7th International Conference on Intelligent Human Computer Interaction, Sushil Chandra and his colleagues at the biomedical engineering department of the Institute of Nuclear Medicine and Allied Science in India through an experiment involving analysis utilizing much more recent and statistical techniques coupled with an EEG found that action video game training improves general cognitive abilities like reaction time and stress management through more efficient stress reduction (115, 120). These results, occurring many years after the previous studies, truly establish general causation for action video games improving general brain function; a feat not feasible with older methods. These benefits also have medical implications, as Postdoc Sandro Franceschini and her colleagues in the Developmental and Cognitive Neuroscience Lab at the University of Padua through a controlled experiment find that ”only 12 hr of playing action video games – not involving any direct phonological or orthographic training – drastically [improves] the reading abilities of children with dyslexia” (462). This noteworthy result, published in *Current Biology*, is a testament to the far-reaching and drastic effects of action video games on the brain.

Let me take some time to rebut some of the common arguments against the use of action video games for cognitive improvement. The first of these arguments, used often by parents, is that screen time makes your eyes rot. Although the blue light emitted by screens does interfere

with our circadian rhythm if we receive doses closer to nighttime, the blatant statement of screen time hurting vision completely contradicts results from aforementioned C.S. Green's experiment and many others, in which action video games actually improve vision, thus contradicting the original claim. The second of these arguments is that action video games are unnecessary violent. Without perusing what constitutes unnecessary violence, the benefits described above, specifically that of improving general brain function, apply only to players of violent video games as Sushil Chandra's experiment included a control treatment of non-violent video games. The last and most concrete of these arguments is that video games are a waste of time. I will not directly address this argument; however, I would like to indirectly respond by presenting you with a thought exercise.

Consider all of the time you have spent on the vices of freetime: Netflix, Candy Crush, Youtube, etc. We are all guilty of escaping stress without moving any closer to our terminal goals. What if all of that time had been spent on an action video game? What if every day, when you relax, you were also simultaneously improving your brain's ability? Where would you be? More importantly, where would your brain be? Thank you.