

Internet, Social Media, and Gaming Addictions

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ABSTRACT

This research study explores potential addictive behaviors in human computer interaction. As the power in gaming technology exponentially increases, it's obvious that the focus is on advancement over impact. Media and gaming addiction is a very real concern that is widely brushed aside - it was even recently recognized as neurological disorder by medical professionals. More studies need to be conducted in the future to expand our understanding. In this paper, I will discuss an overview of the experiment, related work, the experiment design, results & discussion, and study limitations.

Keywords: Addiction, gaming, media, behavior

INTRODUCTION

Gaming has grown into a multi-billion-dollar industry in the past few decades, and the improvements in technology have opened opportunities in gaming to incredible realms of possibilities. As computer scientists, we tend to put all our focus on the advancements, why wouldn't we? But, in doing so, the impact is often overlooked. I wanted to shed some light on a harmful side of human computer interaction that is seldom talked about in the world of technological advancements. Unfortunately, the groups of people that gaming addiction is most impactful toward are young adults and children. I believe there is potential for this problem to be solved without losing advancements, we just need more information.

The purpose of this experiment in testing gaming addiction is to explore the connection between the time spent playing a simple game and the amount of time the participant spends on video games and social media per week (answered in a post-experiment survey). The idea behind the game is that it will be mindless and simple to play, and easy to restart if you lose, so the participants can continue to play for as long as they want. I believe the best candidate for this game is Snake, as it needs requires to no skill and it can be addicting to try and beat your own high score.



RELATED WORK

Internet, social media, and gaming addictions are researched as they affect and impact many types of people in different ways. People tend to interact with the internet differently depending on their age group, gender, behavioral habits, or even neurochemical factors [1]. Regular social media service (SNS) and video games use has increased substantially over the last few years [1,2,6,10]. In recent years, this significant increased use (estimated between 1.7 and 10% of the general population) has led the World Health Organization (WHO) to include gaming disorders in the list of mental health conditions in 2018 [10]. According to WHO, internet gaming disorder is characterized by a "severely reduced control over gaming, results in an increased gaming time and leading to negative consequences in many aspects of the individual life: personal, family, social, occupational, and other relevant areas of functioning" [10]. Additionally, Internet Gaming Addiction (IGA) has been listed as an emerging disorder worthy of further investigation in the latest version of the Diagnostic and Statistical Manual of Mental Disorders V (DSM-V) [9]. Research shows that online game playing elicits a neurological response connected to pleasant feelings, which results in addictive behavior [2]. Important statements to note in the DSM-V: "loss of enthusiasm for past leisure activities" and "continuing the use in spite facing problems" [2].

While most people that participate in gaming may consider it a pleasurable pastime activity, the research suggests that online gaming in excess, in extreme cases, may lead to

symptoms commonly experienced by substance addicts such as mood modifications, craving, tolerance, and withdrawal [4, 8]. After a nationwide study conducted and analyzed in Germany about online gaming addiction in children and adolescents, it appears that the symptoms of the gaming addiction in the children/adolescents are comparable with the official symptoms for substance dependence [5]. The only distinguishing feature is the lack of the ingestion of a psychoactive substance [4,5].

Recent research examines the relationship between leisure boredom and technology addiction specifically among teens and young adults. A widespread belief is the main reason for addictive behavior is lack of self-control [2]. Addicts thought they played online games during free time or to relax, but in reality, it was because they were lonely. In particular, loneliness and self-control were significant predictors of social media or video game addiction [2]. More specifically, game addiction was related to gratifications, self-esteem, leisure boredom and loneliness and self-control is negatively correlated to online video game addiction [2].

More about self-esteem, additional studies examine the relations of social media addictions to mental health and self-esteem [3]. It is proven that a prolonged use of SNS, specifically Facebook, is associated with mental health problems such as stress, anxiety, and depression [3]. In a study conducted with college students, this also had a very negative effect on their academic performance. The link between social media use and depression, especially in young adults, is not a new idea. Many studies have been conducted and there is a clear connection between increased social media use and an increase depression. In a specific study from 2010, results indicated that, after 9 months of exposure to the Internet, moderate and severe problematic users were about 2.5 times more likely to develop depressive symptoms and were labeled clinically significant in comparison to the normal users [9].

Excessive online video gaming and social media use is also suspected to induce sleep difficulties [7,9]. There are studies that show SNS addicts have more difficulty sleeping compared to non-SNS addicts, as they stay on games and social media even when it is better for them to get sleep instead [7]. Additionally, studies involving massively multiplayer online role-playing games (MMORPGs), such as World of Warcraft and other game types have been conducted comparing players who habitually play the during the day and night and researched their sleep quality [9]. Results showed that these MMORPGs might be associated with sleep problems, poorer quality of sleep, and shorter sleep duration [9].

EXPERIMENT DESIGN

For the testing of my project, I created a simple and easy-to-play game that will endeavor to test addiction behaviors in human computer interaction. This game (Snake) will make it so that it will be easy to lose track of time while playing if the participant is one to normally lose track of

time on games and social media. The participants will be allowed to play the game for as long as they choose and stop the game whenever they choose. The idea behind a lack of time minimum/limit is to bring out each participants' normal gaming habits. The independent variable in this experiment will be the stopwatch. Manipulation of the independent variable will not be any manipulation of the stopwatch itself, but manipulation of its visibility to the experiment participants. Half of the participants will have access to a visible stopwatch and be able to see how long they have been playing the game from start to finish. The other half of the participants will not be able to see how long they played the game at any time.

This experiment has a between-subjects study design. Of the 20 total participants, 10 were in Group A with the visible timer and 10 were in Group B without the visible timer.

When each participant has finished playing, they were presented with a post-experiment survey to answer questions about their normal gaming and social media habits. These questions included: age, hours per week playing video games, hours per week using social media, and an accurate Screen Time Daily Average report from their phone settings. The survey form also recorded data from the timer (visible or invisible) as well as the number of times the participant restarted the game, but these values were hidden from them, just to avoid any opportunity they could be altered.

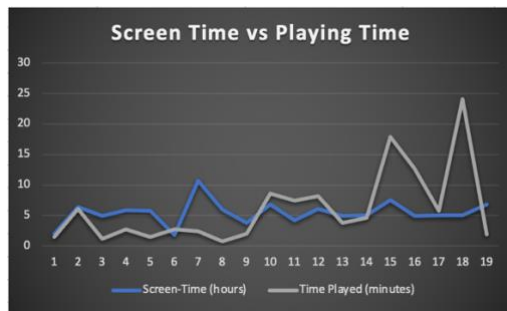
In analysis, the participants' game playing times will be compared with their survey responses to determine if lifestyle gaming and social media habits were reflected in the game experiment. Additionally, the results of the independent timer variable will be compared to determine if the ability to see their gameplaying time affected if participants stopped earlier.

RESULTS

As mentioned above, there were 20 total participants in the study. 10 participants in Group A, who were able to see their time as they played and 10 participants in Group B, who were not able to see their time as they played. The average playing time of Group A was 2.375 minutes. The average playing time of Group B was 9.507 minutes. After performing a two-sample T-test on the data to test the null hypothesis, the t-value is -3.18946. The p-value is 0.05079. The result is significant at $p < 0.05$.

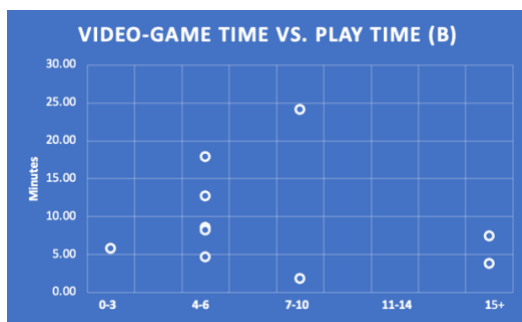
In addition to comparing the results of the time regarding the independent variable, I also made some comparisons with the participants survey responses. In the survey, I requested each participants' official Screen-Time Daily

Average as recorded on their phone. I was curious to see if this had any impact on playing time.



There was one participant who did not report their screen time, and there appears to be a few screen-time outliers. Regardless, screen-time appears to have not affected the playing time of the participants. More about this later.

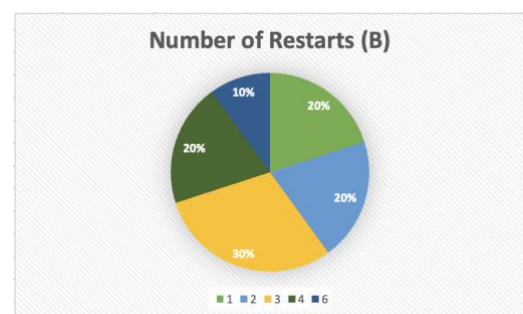
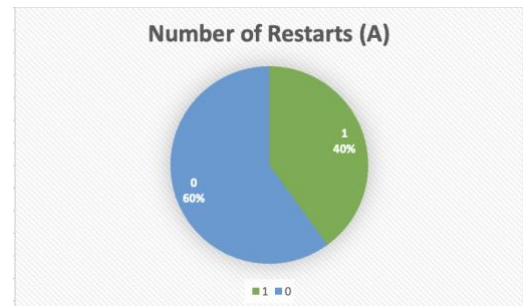
Another question for the participants in the post-experiment survey was: roughly how many hours per week do you spend playing video games? These results were split into Group A and Group B and plotted against playing time for comparison.



In Group A, the participant with the highest reported video game playing habits spent the most time in the experiment, which follows along with what would be expected. However, in Group B, two participants reported that they spend 15+ hours per week playing games but they spent some of the least time playing the experiment in comparison with the rest of the participants with that group (however, when comparing with all participants, it was an average score). Since the average in Group B was so high, it appears that the 15+ participants played for such a short

period of time, but if they were in Group A, they would be near the top of the time scores. Again, I will discuss my thoughts about this later.

One last piece of data that I collected, and found very interesting in its results, was the number of times each player restarted the game. It seems trivial, but it says a lot about how invested someone is in the game by how many times they restart to make their score better than the last time. Here is the data from the number of times each player restarted from Group A and Group B:



For some reason, every single participant in Group A only restarted the game once or did not restart at all. This matches up with the very low playing time average, but it is an odd statistic. In Group B, there were many different restart numbers, but also a larger range of playing times.

EXPERIMENT LIMITATIONS

I noticed a few limitations with the nature of the experiment and how the data was gathered. Due to COVID-19, I was very limited with the people I could reach out to and the classmates/friends I could find willing to participate in my study. Although the nature of my experiment is completely online, it would have been much easier to find participants in a face-to-face environment.

There is also something important to note in terms of the participants that may have potentially skewed results. When I was first receiving submissions from classmate participants, most of the playing times were quite low. I asked a few friends outside of class to participate and those playing times were significantly higher in comparison. I'm curious if incentivizing participation with credit may have resulted in class participants quickly doing others'

experiments for points rather than taking the time to do the best they can. I would be interested to do my experiment again with more participants to see if I can still reject the null hypothesis.

DISCUSSION & CONCLUSION

In my study to explore addictive habits in media and gaming lifestyles, I found that there was a significant effect on showing a player their elapsed time on their playing time. I find this to be important because a big part of video game addiction is losing track of time in the game. As mentioned early, there is clearly still a lot more to be researched about video game and media addiction.

I want to discuss a bit more about my results. In one of the comparisons in my results, I showed a plot that contained Screen Time vs. Playing Time. The reason I think this was inconclusive is because Screen Time could be any type of application on the phone – it may not be a game. If the participant spent all their reported screen time on social media or even watching a TV show, this would not be represented in the experiment. Future experiments and studies would be able to pick out these variables and determine what is most applicable to what is causing such a heightened screen time.

Due to the small scope of the participants, the results may have been skewed as well. If I were to perform this test again, I would widen the scope. For my experiment, the age range was 19-28. While the main concern of media addiction does fall between 18-30, I would be curious to test those bounds. Additionally, almost all of my participants were computer science students here at CSU. Due to COVID-19, I did not really have access to other groups or departments and could only contact the people that were closest to me. For the same reason as age, I would be curious to know if results would vary based upon location, hobbies, or even college major.

In conclusion, I decided to study quite a small scope of a large, and growing, problem. It is something I'm passionate about. I'm concerned about what may happen to some of the younger generation if other people do not see video game and media addiction as a problem as well. As I

mentioned before, where there are advancements there are impacts. In the case of addiction, it can creep up on you and you don't realize until it's too late.

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