

The Sum Assessment System
(Technical Paper)

On Video Games and Social Behavior
(STS Paper)

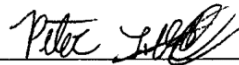
A Thesis Prospectus Submitted to the
Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia
In Partial Fulfillment of the Requirements of the Degree
Bachelor of Science, School of Engineering

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Fall, 2019


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On my honor as a University Student, I have neither given nor received
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Introduction:

What do Captain America, Mickey Mouse, Spongebob Squarepants, and Thomas Jefferson all have in common? The answer is simple – they have all been in video games. But what is a video game exactly? A video game is any form of interactive digital entertainment, whether it be on a home console system, a computer, or a phone (Owen, 2016). According to psychology professor Douglas Gentile, “over 90% of children and teenagers in the United States now play video games” (Gentile et al., 2017). This statistic does not factor for the same people utilizing multiple systems, so the sheer popularity of video games cannot be understated. Video game sales in 2012 doubled by 2017, reaching a global value of 104.57 billion dollars, according to Statista researcher Christina Gough (Gough, 2018). Combining these two statistics together, it is clear that video games are being consumed by people of all age groups. With such a great consumption, however, comes a great risk. Video games are affecting the social behaviors of those who play the games. Social behaviors are how animals of the same species interact with one another, which typically include actions such as communication, cooperation, and aggression (“Social Behavior”, 2019). This question of video games’ impact on social behavior will be examined.

Video games may not just be impacting social behavior, though, but also the way that people think. For the technical research, my capstone team and I are designing an assessment system for The Sum, a nonprofit located in Charlottesville. The Sum has designed an assessment system which identifies patterns of thinking in those who take it. After the assessment is complete, a consultation is scheduled to analyze the results. There are many factors that can affect one’s way of thinking, and the effects of video game usage on social behavior are another parameter that could be directly affecting the results of the assessment.

Technical Topic (Capstone):

The Sum, led by Elliott Cisneros, is a Charlottesville, Virginia nonprofit partnered with the Heather Heyer Foundation which promotes personal growth, skill development, and diversity. The goal of The Sum is to stand in solidarity with all people, no matter their background. The Sum offers a Power of Difference Assessment (PDA). The PDA gathers participants' demographics and asks a series of demographic-based questions. After taking the PDA, a report with results is generated and emailed to the participant. The results are categorized across demographics, areas of strength, and areas of growth. The results help reveal people's demographic biases. Those that take the PDA can meet with a consultant from The Sum to learn about their biases and how to communicate better across demographics. There are paid, free, and organizational versions of the PDA with the only difference being the length of the consultation received ("The Sum", n.d.).

The Sum already has an online PDA system in place. The current system allows users to take the PDA and schedule a consultation. However, the system is error-prone. The system improperly categorizes results and it requires someone at The Sum to manually generate reports and email them to users. As part of report generation, categorizations are manually checked and corrected. This makes report generation time consuming and prone to human error. Although manually generating a report only takes a few minutes, the time from PDA completion to reports being emailed to users varies based upon availability at The Sum and can take up to 24 hours. This methodology is not scalable and cannot support the upcoming UVA Department of

Psychology study of 1,000 PDA takers. In addition to this, the current system does not detect a difference between assessment versions. It is also insecure and allows for URL manipulation.

The goal of this capstone project is to make a new PDA system. The new system should include all the features of the current system. The new system should correctly categorize results, generate reports, email reports to users, and detect which version of the PDA is being taken. For organizational and paid versions of the PDA, the new system should handle organizational access and payments correctly. The new system should also have security checks in place to prevent revisiting previously answered questions and URL manipulation.

In order to make the new system, requirements had to be gathered from The Sum. Requirements determine what features should be part of the new system and which features should be prioritized. Feature prioritization impacts the development timeline. Requirements help track development progress. Separating the work into requirements allows the team to determine who works on which features. Most importantly, requirements establish clarity between the capstone project team and The Sum for what is to be built.

Minimum requirements are to make a system where users can sign up with a valid email address, undergo email verification, select which version of the assessment to take, fill out user demographics, answer each question of the PDA, only view one question at a time, only answer questions in order, and have access to the separate consultant scheduling system. Users cannot change responses to previously answered questions. For the minimum requirements, assessment versions do not have to differ and The Sum should have administrator access to the system so they can view results, generate reports, and email reports to users.

Desired requirements include having the system correctly categorize results, generate reports, and email the reports to users and The Sum. Desired requirements also include implementing the paid and organizational versions of the PDA, moving the system to the cloud for scalability, and enhancing the systems administrator experience for The Sum.

Optional requirements include integrating the consultant scheduling system with the PDA system, supporting mobile devices, supporting changing the PDA questions, letting The Sum give consultants permissions to view specific user's results within the system, and allows organizations to view the results for their members who have taken the PDA.

Video Games and Society:

Do we define video games, or do video games define us? I attest that this interaction is not one sided, but rather that it goes both ways. This is the basis of co-production, an STS theory articulated by Sheila Jasonoff, an STS professor currently teaching at Harvard. Co-production can be summarized as a theory that states that both technology and society impact each other, and that both must exist co-dependently to exist at all (Jasonoff, 2004). Co-production is typically seen with one of four themes. These four themes are “the emergence and stabilization of new technoscientific objects and framings, ... the resolution of scientific and technical controversies,” the process of making science and technology “intelligible and portable,” and, lastly, science’s shift in “cultural practices in response to the contexts in which science is done” (Jasonoff, 2004). Critics generally accept co-production. Dutch scientist R. Wehrens states that co-production “offers a useful approach to studying collaborative formats between research and policy makers or professionals” (Wehrens, 2014). Another benefit of co-production that Wehrens brings up is that “it allows more explicit attention for the processes through which boundaries

between domains are constructed and redefined according to different purposes” (Wehrens, 2014). The positives of co-production are essentially that instead of separating technology and society and looking at them differently, co-production looks at the two together. There are opposing STS theories, however. The social construction of technology, developed by Dutch professor Wiebe Bijker and Cornell professor Trevor Pinch, states that society is what influences technology (Klein, 2002). This is akin to stating that society defines video games, and video games have no impact whatsoever. Another theory, technological determinism, which states that technology is what influences society, is used by Adekunle Ajasin University’s Oyewole to argue that video games are created specifically for making ideological statements about gender and feminism (Oyewole, 2015).

With video games, co-production is relevant because of the influence that society has over games, and that games have over society. The contents of games influenced society enough to create the Entertainment Software Rating Board, or ESRB, which is an organization created to assign age recommendations to games and other media (“Our History”, 2019). This in turn influenced the game industry, as, according to the FTC, “87% of kids under the age of 17 are turned away when trying to buy an M-rated game at retail” (“Our History”, 2019). Because of this, video game companies may consider adjusting their content to have a rating that is not M, as non M-rated games typically sell better. This cycle continues, where video games are released and influence society based on the contents of the game, and society’s reception of the game influences the video game industry to keep producing that game genre, or to slow production of that game genre. For example, *Player Unknown Battlegrounds*, a battle royale video game in which players attempt to eliminate each other by picking up weapons and other materials on a shrinking playing field, had great success in 2017 and 2018 (Avard, 2019). This caused many

other video games to release battle royale modes, such as *Black Ops 4 Blackout*, *Apex Legends*, *Fortnite*, and more (Avard, 2019). This trend of competition is not just limited to the current day with just one genre, though, as virtually every video game genre is met with competition. For instance, in the 1970s and 1980s many arcade shooter games came onto the scene, like *Galaga*, *Space Invaders*, *Asteroids*, and more (Stahl, 2005). This video game and society cycle is not a recent development, but has been ongoing for decades.

This research of how video games affect social behavior is important because video games affect a huge portion of society. There are concerns of video games instilling destructive behaviors among players, which is certainly a problem if every video game had this negative effect (Maldonado, 2018). On the contrary, video games also have the capability to instill prosocial behavior in players (Gentile, 2009). Video games have the power to influence social behavior both positively and negatively, and it is important to understand which types of games genres and content leads to which outcome. As more and more people are introduced to and play video games, it is important to understand the potential social effects and specific video game may have.

Research Questions and Methods:

The STS research question addressed is the effect of video games on the social behavior of humans. To pursue this research question, one method I will use is documentary research. Existing research includes studies done by Gentile, University of Innsbruck professor T. Greitemeyer, and Maitland et al. (Gentile et al., 2009; Greitemeyer et al., 2012; Greitemeyer et al., 2014; Maitland et al., 2018). The work done by these groups of people is related to video games' effects on prosocial and destructive behavior, which can be used as an overview of

effects that video games in general can have on social behavior. Another method I will employ is case studies. By looking at specific games and using surveys answered by the players of that game, I will be able to determine the effects of that game on the players' social behaviors. One case study will be the social effects of *Fortnite Battle Royale* among children under the age of 12, which was examined by Gil et al. (Gil et al., 2019). Another case study is the social effects of *World of Warcraft*, examined by Colorado State University's J. Snodgrass, an anthropology professor (Snodgrass et al., 2011). Between the documentary research and case studies, some of which have surveys embedded in them, I will be able to examine the differing effects of certain video games on human social behaviors, and quantify which aspects of a game contribute to it having a more violent or prosocial effect. With this, I plan on showing that video games are able to have prosocial effects, not just violent effects, and also suggest methods for reducing the violent effects of some games.

Conclusion:

In conclusion, the technical deliverable is The Sum Assessment System. This system is a website for people to take the Power of Difference Assessment, schedule a consultation, and talk with a consultant to interpret the results of the assessment. By the end of the fall 2019 semester, the assessment is anticipated to be up and running, with further development and features being added throughout the spring 2020 semester. The STS deliverable is an analysis of how video games affect social behavior in humans by examining the contents of video games of different genres. The prospectus is anticipated to be completed at the end of the fall 2019 semester, and the rest of the thesis will be completed by the end of the spring 2020 semester. With both deliverables completed, the effects of video games on both social behavior and thinking patterns

can be examined. I anticipate that the results will indicate that violent video games tend to lead to more narrow-minded thinking, and the prosocial games will lead to being more open minded.

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