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ASSESSING THE ABILITY OF VIDEO GAMES AS A FORM OF SERIOUS LEISURE TO HELP INDIVIDUALS COPE WITH THE SYMPTOMS OF AUTISM SPECTRUM DISORDER

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ABSTRACT

Video games are typically given a negative connotation, being associated with violence and addiction. However, they must be looked at for the possible positive effects they can have on those who engage with them. This paper focuses particularly on young adults with ASD and their experiences with video games. Time diaries and semi-structured interviews were used to gain open-ended responses that allowed researchers to see how video games have or have not been able to help these individuals cope with the symptoms of their ASD. Results showed there are multiple areas in which video games can have a constructive effect on those who engage in the activity. Some of the benefits include forming relationships, releasing stress, and learning social skills. Future research should focus on the design and production of video games with goals that incorporate social development while still providing the coping effects already displayed.

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Chapter 1

Introduction

Autism Spectrum Disorder (ASD) is characterized by social and communicative deficits as well as repetitive stereotyped behaviors and is currently estimated to be present in 1 of every 50 school-age children (Blumberg et al., 2013). Most reports of the presence of ASD in the population are focused on children. The incidence of ASD in adults has not been looked into as commonly but Brugha et al. found that the numbers are higher than anticipated. Using a number of surveys, they discovered a prevalence of approximately 1 in 100 (Brugha et al., 2011).

Individuals with ASD may have difficulty understanding and responding to other people's emotions, understanding social rules, and sustaining an appropriate conversation topic (Center for Disease Control and Prevention, 2014). Further, research has suggested that over 80% of individuals with ASD also experience subsequent difficulties with stress and/or anxiety (Bradley, Summers, Wood & Bryson, 2004). Researchers are continuously looking for ways to help individuals with ASD cope with the symptoms of their disorder and any other concomitant disorders they may have (e.g., Baron, Groden, Groden & Lipsitt, 2006; Bradley & Caldwell, 2013; Lytle & Todd, 2009). The purpose of this thesis was to investigate one possible mechanism for coping with stress, anxiety and other symptoms of ASD by young adults, engagement with video games.

Autism Spectrum Disorders

According to the American Psychiatric Association (APA), ASDs are "a range of complex developmental disorders that can cause problems with thinking, feeling, language, and the ability to relate to others." (2012). Since the publishing of the fifth

edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V; APA, 2013), the term ASD is now used as an umbrella term to include what were formally known as Autistic disorder, Asperger's syndrome, Childhood Disintegrative Disorder, and Pervasive Developmental Disorder - Not Otherwise Specified (PDD-NOS). Those who are diagnosed with ASD display communication and social deficits, which may cause them difficulties in areas such as reading nonverbal cues or initiating and maintaining friendships (APA, 2013). It is also common that those diagnosed with ASD are dependent on routines, show hyper- or hyposensitivity to sensory stimuli or maintain an intense interest in a specific topic area (APA, 2013).

The spectrum aspect of ASD refers to the fact that no two individuals experience the symptoms of ASD in exactly the same way or with the same level of intensity. Because the symptoms of ASD manifest in a number of ways and at various severity levels, the DSM-V has modified how the spectrum aspect of ASD is described at the time of diagnosis. The modifications in the DSM-V include the application of a level-based system to specify ASD severity. Those levels are as follows: Level 1 – Requiring Support, Level 2 – Requiring Substantial Support and Level 3 – Requiring Very Substantial Support (Carpenter, 2013). The criteria for these severity levels are based on the amount that social deficits and restrictive and repetitive behaviors interrupt functioning. An ASD diagnosis with Level 1 severity indicates an individual's social communication deficits cause noticeable impairments when there are no supports in place. Those classified within this level have difficulty initiating interactions and may come across as disinterested in conversation due to their socially inappropriate responses. Individuals with Level 1 severity also engage in rituals and repetitive behaviors (RRBs)

that interfere with functioning and resist attempts by others to interrupt them. A designation of Level 2 severity indicates that even with supports in place, a person's verbal and nonverbal social deficits are apparent. Also, their RRBs occur often enough to be noticed by the average observer and any interruption causes distress. An individual whose diagnosis is categorized as Level 3 is very unlikely to initiate social interactions, provides minimal social responses and has functioning that is severely impaired by communication skill deficits. It is very difficult to interrupt or redirect an individual under this classification from their fixated RRBs as it causes significant distress (Carpenter, 2013).

Other Disorders Associated with ASD

Although the literature may not reflect this, it is fairly common for individuals with ASD, regardless of severity of ASD symptomology, to also be affected by another disorder (Matson & Nebel-Schwalm, 2007). If fact Simonoff et al. (2008) studied 112 children with ASD and found that 70% of the children had at least one comorbid disorder and 41% had two or more. The most common disorders present were social anxiety disorder, ADHD and emotional and behavioral disorders. Further, individuals with ASD are more at risk for developing disorders such as anxiety and depression than the general population (Kim et al., 2000; Mazurek & Kanne, 2010). Bradley, Summers, Wood & Bryson (2004) found that approximately 84% of individuals with ASD experienced comorbid stress and anxiety disorders. Further, Lytle and Todd (2009) reported individuals with ASD typically experience intensified stress responses and take longer to recover from stressful situations and events.

Comorbid diagnoses add additional difficulties that compound the social and communicative deficits associated with a primary diagnosis of ASD. Anxiety and/or stress can enhance the difficulty individuals with ASD have when communicating and engaging in social interactions. These issues need to be considered when planning interventions. Treatment should not only address the symptoms associated directly with a disorder, but also the extended effects that may not fall under diagnostic criteria. Finding a method that reduces this stress or anxiety while also giving individuals with ASD a chance to work on those symptoms more directly associated with the disorder would be ideal.

Methods of Coping

Researchers have taken either one of two approaches to describe the process of coping. The trait approach considers coping to be a habitual phenomenon of problem-solving thoughts and actions. On the other hand, the process approach sees coping as a transactional occurrence that varies according to changing stressful situations (Penley et al., 2002). These two approaches seem to correlate with the ideas of coping resources and coping strategies.

> "Briefly, coping resources refer to dispositional coping styles such as personality dispositions (e.g., "hardiness," Kobasa, 1979), social support network, and one's perception that support would be available when needed (perceived social support). Coping strategies, on the other hand, refer to situation-specific behavioral and cognitive responses to deal with stressors— when actually facing stressors, people use certain strategies, direct or indirect, to cope with them (e.g., to seek a leisure opportunity to socialize with others in response to the stress of doing solitary work)." -Iwasaki & Schneider, 2003

When dealing with stress on a case-by-case basis, methods typically fall into one of two categories: problem-focused or emotion-focused. While the two are not

necessarily mutually exclusive, problem-focused approaches are more straightforward and actively pursued. An example would be direct problem solving with the intent of lessening the stressor and it's effects (Compas, 1987; Penley et al., 2002). This can be done by gathering information and planning a course of action (Penley et al., 2002). Emotion-focused approaches are indirect and include things like emotion regulation, focusing on the positives of a situation distancing oneself from the stressor or seeking emotional support from others (Iwasaki & Schneider, 2003; Penley et al., 2002).

The way in which someone chooses to cope typically varies based on situational and individual factors. Situational factors include how controllable the situation is and how likely it is to change while individual factors involve the person's resources, self-confidence and emotional disposition (Penley et al., 2002). For example, if a particular situation cannot be controlled or directly affected by an individual, he or she may decide to cope emotionally by detaching from the situation.

Leisure as a Method of Coping

Leisure activities have been identified as an effective method of coping with stress (McKean, 2000; Iwasaki, 2003). Regardless of the category they fall under, they all seem to offer individuals with a comfortable environment where they can be themselves (Iwasaki et al., 2006). It is also important to note that when referring to leisure, activities are not required to be primarily physical in nature. They can include spiritual, social and mental aspects while providing a way for individuals to cope with stress (Iwasaki et al., 2006). For example, Delgado-Bridges (2012) looked into the creation of a curriculum centered on yoga as a means for individuals with ASD to cope with stress while promoting physical fitness. Leisure has been shown to have motives

that have stress-reducing properties. These motives include relaxation, escapism, compensation and independence (Iwasaki & Schneider, 2003).

When identifying the effects of leisure coping, researchers have typically studied two classifications: leisure coping beliefs and leisure coping strategies. Leisure coping beliefs refer to an individual's belief that leisure activities help them cope with stress. Along those lines, leisure coping strategies are the actual coping behaviors available through involvement in leisure activities (Iwasaki, 2003). These concepts are usually compared to the idea of general coping, which is coping not directly associated with leisure. When looking at the effects of leisure coping on the stress experienced by college students, "leisure coping beliefs significantly contributed to greater coping effectiveness, higher satisfaction with coping outcomes, and the reduction of stress" (Iwasaki, 2001). These beliefs also predicted greater levels of psychological well-being and lower levels of mental illness when compared to general coping (Iwasaki, 2003; Iwasaki, 2010). Iwasaki (2010) also found that engaging in leisure allowed individuals to feel empowered in managing their stress. They are able to interpret their challenges and utilize internal resources to promote growth. Furthermore, these leisure activities allowed people to take a break from their stressors. They gathered their energy and regrouped in order to successfully address their issues (Iwasaki, 2010).

Video Games as a Form of Leisure

The Entertainment Software Association (ESA) collects and distributes information about the video gaming industry. In 2013, they reported that 58% of Americans play video games and consumers spent approximately $21 billion within the year (Entertainment Software Association, 2013). The average age of video game

players is 30 years old and on average gamers have been playing video games for 13 years. In regard to types of video games played, 32% of gamers play social games. Furthermore, 62% of players engage in play with others, whether it be online or in-person and of that group 77% do so at least one hour per week (Entertainment Software Association, 2013).

In general, discussion regarding video games tends to center around the negative effects that they have on our youth and most research on video games revolves around the effects of violent video games (Anderson, 2004; Anderson & Dill, 2000; Kirsch, 2003). Violence and aggression seem to be two words that are used almost synonymously with video games. Despite the fact that many associations with video games are negative, there are some researchers who study the positive ways in which video games can affect someone. For instance, Olson et al. (2008) received feedback directly from boys that were 12-14 years old and found that they engage in violent video games because they are attracted to the qualities of the main character such as strength and perseverance. They also were aware that the behaviors they act out in these games have serious consequences in the real world and are not to be imitated. Video games were seen more as a way to act out power fantasies, experience challenges, cope with anger and stress and engage socially with peers (Olson, 2010; Olson et al., 2008). It seems that most adolescents enjoy playing video games simply because they are enjoyable and provide an opportunity for challenge and competition. A number of games also give players the opportunity to express their creativity through making something new, whether it be the appearance of an avatar or the building of a new level (Olson, 2010).

Video games have been linked to other positive outcomes in adolescents. Durkin and Barber (2002) observed that when comparing 16 year old high school students, those who played computer games scored higher on a number of measures including activity involvement, family closeness, positive mental health and self-concept. Physical activity has also been positively correlated with the amount of time spent playing video games (Mhurchu, 2008). Video games also have a positive effect on vision as those who engage typically have higher visuospatial abilities (Ferguson, 2007; Green & Bavelier, 2006).

ASD and Video Games

Video games can be used as a form of entertainment or a way to release energy by primarily presenting a virtual reality that allows players to navigate an environment and interact with people and objects (Parsons & Mitchell, 2002). The rule-based nature of video games provides a structure that can be particularly appealing to individuals with ASD (Parsons & Mitchell, 2002; Wilkinson et al., 2008). In fact, children with ASD were found to spend more time engaging in video game play than their typically developing siblings (Mazurek & Wenstrup, 2012). Simply being a video game player can offer certain social opportunities for those with ASD, there are a number of different ways to meet other people who share their interest in gaming generally or in one game specifically. Whether it is by joining a video game club or finding a regular playing partner online, relationships can be built in whichever way the individual is most comfortable.

Research regarding the positive effects that video games can have on young adults with ASD is limited, however the information available provides insight on outcomes that are varied and warrant further exploration. For example, Mazurek and colleagues

(2010) found that although individuals with ASD may spend more time engaging in media, a majority are involved primarily with non-social media such as watching television and playing video games alone (Mazurek et al., 2012). It has also been reported that boys with ASD are more at risk for problematic video game use than their typically developing peers (Mazurek & Engelhardt, 2013). These two findings display a need for video games to be directed toward a format of utilization that can have a positive effect on those who play.

Other research has demonstrated positive effects of video games, though these studies have tended to include samples from a younger population. Regardless, these studies show that video games can be used to improve social skills while increasing motivation and generalization in children with ASD (Wilkinson, Ang & Goh, 2008). This finding has proven to be fairly robust in that it has held true when tested across cultures and age groups. Results across many groups indicated that engaging in prosocial gameplay resulted in more prosocial behavior (Gentile et al., 2009, Greitemeyer & Mugge, 2013).

Video games may also provide a means to educate those with ASD on social conventions. When compared to control groups, teens with ASD interacted within virtual environments similarly. However, they exhibited a certain lack of social protocol by doing things such as walking between other characters (Wilkinson, Ang & Goh, 2008). Virtual environments have also been proven to increase the judgement of adolescents with ASD when deciding how to behave is certain improve every day situations such as deciding where to sit in a café or on a bus (Mitchell, Parsons & Leonard, 2007).

This is evidence indicates that, if used correctly, video games can serve as an effective intervention tool to assist in enhancing the social and communication behaviors for individuals with ASD. As a result, this paper will address the following research question: How can video games be used to help young adults with ASD to cope with their ASD symptoms?

Chapter 2

Methods

Design

This study was designed to use qualitative research methodology to gather information about how engaging in video game play has helped young adults with ASD cope with their symptoms. The data set used for this research was acquired as part of a larger project.

After using surveys to recruit and select participants who met the inclusion criteria, time diaries and interviews were utilized to assess the amount of time spent playing video games and to learn about the effects they have had on the participants. The semi-structured nature of the interviews allowed researchers to maintain control of the topic while still receiving original and informative open-ended responses. Those who were asked to continue with the study after completing the screening questionnaires were those who were identified as engaging in video games as a form of serious leisure as measure by the Serious Leisure Inventory and Measure (SLIM). The concept of serious leisure was utilized in or to ensure that those who participated in this study engaged in video games a significant amount of time. This allowed the researchers to gather data from a sample that was more likely to use video games for a variety of purposes, including potentially as a method of coping, rather than strictly for entertainment purposes.

As defined by Stebbins, serious leisure is "the steady pursuit of an amateur, hobbyist, or career volunteer activity that captivates its participants with its complexity and many challenges" (2001). This idea has been applied to activities such as swimming

and motorsports to determine the frequency and intensity of engagement by individuals with interest in these activities. The SLIM uses factors such as perseverance, self-gratification and group attraction to determine how serious an individual is about engagement with an activity (Gould et al., 2008). To assess this concept with the leisure activity of playing video games the SLIM items were adapted for application to a media-based form of leisure. The concept of serious leisure has not typically been applied to media-based forms of leisure, though there is no reason that video games should not be able to be utilized as a form of serious leisure because they can offer the same rewards for the participant as ice-skating or bass fishing. These rewards are simply distributed through a different medium. Therefore, for the purpose of this research investigation, questions from the SLIM were modified to pertain to video games and used as a screening tool.

Recruitment

Recruitment was done via posting on various video games websites and forums. Those interested were asked to contact one of the Principal Investigators through email. Following initial contact, the PIs sent a demographic questionnaire (Appendix B) and serious leisure questionnaire (Appendix C) to the interested individual. Those who were shown to have been utilizing video games as a form of serious leisure were then able to continue on with the rest of the study. Through this process, a total of eleven individuals with ASD were chosen as participants.

Participants

In order to participate in the study, individuals were required to be between 18-30 years of age and engage in video games a form of serious leisure. Data was collected

from individuals with and without ASD, however for the purpose of this research question, only data from those with ASD was used. Through the recruitment process, data were obtained from eleven young adults with ASD. Participants' age ranged from 18 to 24 with an average of 21. Ten of the eleven participants were male and all were White. Nine of the eleven had a diagnosis of Asperger's Syndrome while the other two were diagnosed with Autistic Disorder. The amount of time spent playing per week ranged from 6 hours to 56 hours, providing a mean of approximately 29 hours per week. Table 1 below presents a composite of this information including the perceived severity of diagnosis as well as preference of gameplay.

Table 1. Demographics

Age	Sex	Race	Ethnicity	Diagnosis	Hours played per week	Preference of play
22	Male	White	Not Hispanic or Latino	Asperger's	20	With others online
24	Male	White	Not Hispanic or Latino	Asperger's	35	With others online
22	Male	White	Not Hispanic or Latino	Asperger's	40	With others online
24	Male		Not Hispanic or Latino	Asperger's	30	With others in person
22	Male	White	Not Hispanic	Asperger's	20	With others

			or Latino			in person
			Not Hispanic			
18	Male	White	or Latino	Asperger's	15	Alone
			Not Hispanic	Autistic		
22	Male	White	or Latino	Disorder	10	Alone
			Not Hispanic			With others
	Female	White	or Latino	Asperger's	6	in person
			Not Hispanic			With others
18	Male	White	or Latino	Asperger's	50	online
		White & American				
		Indian/Alaska	Not Hispanic			
18	Male	Native	or Latino	Asperger's	40	Alone
			Not Hispanic	Autistic		
24	Male	White	or Latino	Disorder	56	Alone

Materials

The demographic survey (Appendix B) and serious leisure statements (Appendix C) were created by members of the research team using Qualtrics™ survey software. Questions were centered on the participants' diagnosis and level of engagement with video games. The subsequent time diaries were completed by continuing participants using an Excel spreadsheet designed by the researchers. Following the completion of the time diaries, interviews were conducted via Skype™ and either audio or video recorded

with QuickTime Player™. Members of the research team then transcribed all interviews verbatim using Microsoft Word™ documents.

Procedures

Upon receiving approval from the Office of Research Protections at The Pennsylvania State University, recruitment messages were posted online to video gaming forums, Google and Yahoo! groups and other social media sites. The message stated that those interested in participating should email one of the Principal Investigators. Prior to providing any demographic information or completing any of the SLIM questions the participants were notified that they were providing their implied informed consent to participate by completing the survey. Those who met all inclusion criteria (based on demographic and SLIM data) were then sent a seven-day time diary to complete. Once returned to the researchers, a time was scheduled for the interview to take place. Interviews were conducted by either of the two PIs.

Before beginning the interview, the PI allowed the participant to ask any questions regarding any aspect of the study. Once all questions were answered, the PI started the interview by asking a series of questions about the participant's history playing video games (e.g. How long have you played video games?). Then questions also addressed the participant's video game habits and how they may or may not affect their daily lives. Interviews were conducted via Skype and each lasted approximately an hour.

Data Analysis

Interviews were transcribed verbatim using Microsoft Word. After initial transcription, the transcripts were checked by another researcher to establish reliability.

Identifying information was removed to protect the identity of the participants. To maintain confidentiality, all participants were assigned pseudonyms and locations were replaced with general geographic locations. Once the transcripts were complete, they were sent back to participants for review. This gave the participants an opportunity to add anything they may have forgotten or take out anything they would rather not have said.

Once all the final transcripts were returned, they were divided into thought units, or the smallest pieces of dialogue that represent a full thought. This prepared the data for open coding where researchers read through the transcripts and identified broad themes that emerged from the data set.

Chapter 3

Results

Emotional Effects of Video Games

When asked, "How does playing video games make you feel?" all responses were positive. Participants provided answers that included "…it does make me feel relaxed", "there's a calming effect" and "feel happy". Video games were referenced as a stress reliever and a means of escaping from daily hassles. One participant, who also has a diagnosis of depression/anxiety, was asked whether video games have helped with those diagnoses as well and he responded by saying, "Sometimes yes, it is a coping mechanism." Also pertaining to coping, another participant shared, "playing video games does make me happy, so… if I'm feeling sad… they have helped me pass through some stuff". One individual spoke specifically about using Wii Sports, particularly bowling, to reduce anxiety when he has a lot on his plate. When prompted about why the bowling has such a beneficial effect, the participant stated, "Because you get to, Wii bowling like the throwing of the ball you get energy out."

Forming Friendships

The top benefit associated with playing video games was the role they played in allowing participants to form friendships. Most reported either making friends through joining a video game group, utilizing games as a conversation topic or playing with people online and growing closer through continued play together. Two participants stated they had met some of their online friends in person and grew closer, one declaring

> "…if you made a friend online you can, like I've added some people's Skype names or Facebook names. I've added some people that I've met in real life and, so we ended up talking more because I met them."

But it seems that even without the face-to-face element, these relationships formed online are still significant. One participant expressed this sentiment when stating "Yea, lots of people I know on the internet are really good friends, like I would genuinely miss them if they were to be offline forever." Video games were also reported to be useful in maintaining already established friendships by one participant who said "… it's definitely good, since I can't hang out with my friends like in person all the time, we can get online, play and stuff."

In addition to presenting an environment in which individuals can make friends, video games may also be able to equip players with skills that will help them relate to others in various social situations. One participant mentioned that video games have allowed him to "read emotions a little better" and spoke about how the situations he is put into when playing have helped him in real life.

> "I get sucked into these stories and worlds, then I can see how the characters react to the situations and how they're feeling… and also I'm put in the place of a character, and that helps me see through their eyes, so it's helped me in the real world, to like kind of, be able to read people better, like connect more with them."

This is a sentiment that speaks to the generalizability of skills that are learned through playing video games to the real world.

Overcoming Obstacles

Another common theme was that of persistence and overcoming obstacles. Two participants spoke explicitly about feeling accomplished when beating a level or reaching a major milestone within a game. One individual also conveyed the enjoyment she receives from improving her gameplay. She revealed,

> "Sometimes I get frustrated if I'm not doing great, like I'm dying or something, and I'm not doing well. But for the most part, it makes me feel really good. Especially if I know I'm doing well and I'm really like advancing my skill level I usually feel like I've accomplished something."

One participant spoke specifically of his affinity for video games due to his being able to explore different worlds through them. He stated that video games give you the ability to "experience stuff you wouldn't normally experience." He went on to say,

> "…even if it is sports games, most people say, oh, sports games, why don't you go play the sport? Well you're never gonna be able to play it on that level. You're never going to, you know, you're not gonna be able to experience like, playing basketball and being able to dunk or stuff like that. Well some people might but it's not something most people can- are playing 11 on 11 football, full contact, not something that most people experience or driving these crazy racecars. Not that I would want to, cause it's kinda dangerous, but virtually it's great to enjoy."

Chapter 4

Discussion

The information gathered from this study provides a fairly solid basis to be used in developing video games to teach certain skills. By learning about the aspects of video games that players appreciate most, games can be created with appealing characteristics while incorporating scenarios and tasks that can enhance skills to be generalized to the real world.

This study also highlighted many of the benefits gained through engaging in video games as a form of serious leisure. Participants reported gaining relaxation, compensation and escapism which are three of the four leisure motives that have been shown to have stress reducing properties (Iwasaki and Schneider, 2003). Those who spoke of reaching out to video games to deal with other stressors demonstrated their use of this activity to facilitate emotion-focused coping. By consciously occupying themselves with an activity that has a positive effect on their mood and allows them to relax, they are distancing themselves from whatever stressors the experience daily.

One thing that has been a general concern regarding video games is the possibility of players taking what they do in the games and attempting to engage in those behaviors in real life. However, when discussing the experience of things out of the norm, one participant exhibited his awareness that things you do while playing video games do not translate to things to be done in real life. And most of the participants thought of video games as a means to escape from the real world for a while. That separation seems to be one of things that draws people to playing video games.

When looking at the benefits that video games can provide in the area of forming and maintaining social relationships, this study showed that for individuals with ASD there are various ways to use videogames. Starting at forming relationships, the idea of using video games as a conversation topic seemed to be one that has broken down communication barriers for our participants. It allows individuals to bond with someone over a common interest that is easier to discuss whether it be one-on-one or within a group devoted to discussing video games. Following initial interaction, the nature of video games today allows these individuals to continue their friendship by playing with each other either online or in person, whichever is most comfortable. The fact that face-to-face contact is not necessary to maintain these relationships via video games can be particularly attractive to certain individuals with ASD.

The versatility of video games also allows the opportunity to meet others and form friendships strictly online. For those who may experience anxiety in social situations, this may be an ideal way to meet others. Then, if they so choose, they can decide to meet their online playing partners in person to add another dimension to the relationship. However, this is a choice that can be made by the individual based on their preferences and level of comfort.

Regarding the development of social skills, individuals with ASD may be able to learn both from the friendships they make and the situations they are placed in within the games. One participant was able to take the opportunities to read and respond to emotions given within the games and apply what was learned to real life settings. This shows that the skills utilized in gameplay can be extended into real life and help those with ASD to maneuver social situations.

A number of participants also mentioned the appeal of the challenging nature of video games and the process they go through to achieve a goal. This exhibits the self-determination disposition that has been considered a buffer against stress (Iwasaki & Schneider, 2003). The sense of accomplishment after working hard to overcome an obstacle can provide a rewarding and joyful result. This can lead to player satisfaction with the outcome of their coping which also leads to improved mental and psychological health (Iwasaki, 2001).

Directions for Future Research

Long term, the goals for research should be aimed at incorporating video games into therapy and intervention for young adults with ASD. Hopefully, this would lead to generalization to other age groups and possibly other disorders.

The next steps in this field of research can go in two directions. Individuals with ASD should be given the opportunity to utilize video games as an option to cope with any symptoms they may experience. They may choose to used of as a strategy to release energy, calm down or escape from the many daily issues they may face.

Another direction includes the development of video games with the purpose of allowing players to experience various every day situations and respond accordingly. This will give individuals the chance to see how their responses are perceive by others, thus shaping their behaviors and allowing those skills to carry over into the real world. If utilized correctly, the full potential of video games can be used to improve multiple aspects of the lives of adolescents and young adults with ASD.

Limitations

It should be taken into consideration that the sample included in this study was fairly homogenous. Ten of the eleven participants were male and all were of white racial background with only one reporting a Hispanic or Latino ethnicity. Also, in terms of diagnosis, nine of the eleven participants had Asperger's Syndrome while the other were diagnosed with Autistic Disorder. In the future, a more diverse sample should be utilized in order to ensure the generalizability of results.

It must also be kept in mind that those who were involved in this study all had mild or moderate forms of ASD that allowed them to be able to complete a survey, time diary and interview. For those with more severe ASD symptoms, further research should be done to observe how video games can be used to assist with their symptoms. It is possible that certain accommodations may need to be implemented to ensure the effectiveness of the games.

Appendix A

Recruitment Message

Interested in video games?

Consider helping researchers at Penn State University with a study investigating the use of video games as a form of serious leisure. We're looking for participants with ASD that are between the ages of 18 and 30.

If you choose to complete this survey, you will answer a series of questions requiring approximately 15 minutes of your time. Participation in this research study is voluntary. There is no anticipated risk to you in participating in this research.

If you complete the survey, you will need to provide contact information. This information will be used to contact you for a follow-up interview based on your responses. Not everyone who completes this survey will be contacted for further participation. Those who are selected for further participation will receive a $100 GameStop gift card.

All identifying information provided will be kept strictly confidential and will be known only by the investigators, Dr. Erinn Finke and Dr. Benjamin Hickerson. If you have questions or concerns please contact either Erinn at 814-867-4340/enh109@psu.edu or Ben at 814-867-2900/bdh14@psu.edu.

Please click the following link to begin the survey: http://tinyurl.com/PSUseriousVG

Appendix B

Demographic Questionnaire

1. *What is your age?* _____ Years

2. *What is your sex?* _____ Male _____ Female

3. *What is the highest level of education you have completed? (check one)*

_____ Elementary School _____ 4-year College (Bachelor's degree)

_____ High School _____ Graduate Studies (Master's degree)

_____ 2-year College (Associate's Degree) _____ Post-Graduate Studies (Doctorate)

4. *What is your ethnicity:*

_____ Hispanic or Latino _____ Not Hispanic or Latino

5. *What is your racial background:*

_____ American Indian/Alaska Native _____ Asian

_____ Native Hawaiian or Other Pacific Islander

_____ Black or African American _____ White

6. *What is your specific ASD diagnosis?*

_____ Autistic Disorder
_____ Asperger's Syndrome
_____ Pervasive Developmental Disorder – Not Otherwise Specified
_____ Rett's Disorder
_____ Childhood Disintegrative Disorder

8. *How would you classify your ASD characteristics?* _____ Mild _____ Moderate

_____ Severe

9. *How old were you when your ASD was diagnosed?*

_____

Video Gaming Behaviors

10. *Which gaming consoles do you currently own? (check all that apply)*

_____ XBOX 360 _____ Playstation 3 _____ PC/Laptop _____ Nintendo Wii

_____ Nintendo DS/3DS/DSi _____ Sony PSP _____ Smartphone/IPhone

_____Tablet/IPad

_____ Other (please list) _____

11. *Please list the top five games, with the corresponding console from the list above, you play most frequently:*

GAME	CONSOLE
1. _____	1.
_____	
2. _____	2.
_____	
3. _____	3.
_____	
4. _____	4.
_____	
5. _____	5.
_____	

12. *During a typical week, how many total hours do you spend playing video games?*

_____ Hours Per Week

13. *How many days per week do you play video games?* _____ Days Per Week

14. *Do you play multi-player online (i.e., internet-based with others) video games?*

_____ Yes _____ No

15. *Over the past year, how much would you estimate that you've spent on video gaming? Remember to include all expenses including consoles, games, controllers, online services, strategy guides, etc. (check one)*

_____ $0 - $100 _____ $101 - $200 _____ $201 - $300

_____ $301 - $400 _____ $401 or more

Appendix C

Serious Leisure Statements

Please indicate your feelings about video gaming by responding to the statements below on the nine-point scale.

If I encounter obstacles in video gaming, I persist until I overcome them.

If I encounter a difficult task in video gaming, I will persevere until it is complete.

By persevering, I have overcome adversity in video gaming.

I overcome difficulties in video gaming by being persistent.

I put forth substantial effort to improve my skills in video gaming.

I try hard to become more competent in video gaming.

I am willing to exert considerable effort to be more proficient at video gaming.

I have improved at video gaming since I began participating.

Since I began video gaming, I have improved.

I feel that I have made progress in video gaming.

I have progressed in video gaming since beginning.

I know of specific instances related to video gaming that have shaped my involvement in it.

For me, there are certain video gaming related events that have influenced my video gaming involvement.

There are defining moments within video gaming that have significantly shaped my involvement in it.

There have been certain high or low points for me in video gaming that have defined how involved I am in video gaming.

I have been enriched by video gaming.

Video gaming has added richness to my life.

Being involved in video gaming has add richness to my life.

My video gaming experiences have added richness to my life.

I make full use of my talent when video gaming.

I reach my potential in video gaming.

Video gaming has enabled me to realize my potentials.

I am realizing my fullest potential in video gaming.

Video gaming allows me to express my knowledge and expertise.

Video gaming is a way to display my skills and abilities.

I demonstrate my skills and abilities when video gaming.

My knowledge of video gaming is evident when participating.

Video gaming for me is an expression of myself.

My individuality is expressed in video gaming.

Who I am is expressed through participation in video gaming.

Video gaming allows me to express who I am.

My view on myself has improved as a result of video gaming.

My image of self has improved since I began video gaming.

Video gaming has enhanced my self image.

Video gaming has improved how I think about myself.

Video gaming provides me with a profound sense of satisfaction.

My video gaming experiences are deeply gratifying.

I find deep satisfaction in video gaming.

Video gaming is intensely gratifying to me.

I find enjoyment in video gaming.

Video gaming is enjoyable to me.

Video gaming is fun to me.

I enjoy video gaming

I feel renewed after video game time.

I feel revitalized after video game time.

I feel invigorated after participating in video gaming.

Video gaming is invigorating to me.

Financially, I have benefited from my video gaming involvement.

I have received financial payment as a result of my video gaming efforts.

I have been paid money as a result of my skills and abilities in video gaming.

I have received monetary compensation for my video gaming expertise.

I associate with other people that are video gaming participants.

I enjoyed interacting with other video gaming enthusiasts.

I value interacting with others that are also involved in video gaming.

I prefer associating with others that are devoted to video gaming.

A sense of group accomplishment is important to me in video gaming.

My video gaming group's accomplishments are very important to me.

Having helped my video gaming group accomplish something makes me feel important.

I feel important when I am a part of my video gaming group's accomplishments.

The development of my video gaming group is important to me.

I contribute to the unification of my video gaming group.

I find value in ensuring the cohesiveness of my video gaming group.

It is important that I perform duties which unify my video gaming group.

I share many of the sentiments of my fellow video gaming devotees.

Other video gaming enthusiasts and I share many of the same ideals.

I share many of my video gaming group's ideals.

I share in the sentiments that are common among video gaming enthusiasts.

Others that know me understand that video gaming is a part of who I am.

I am often recognized as one devoted to video gaming.

Others identify me as one dedicated to video gaming.

Others recognize that I identify with video gaming.

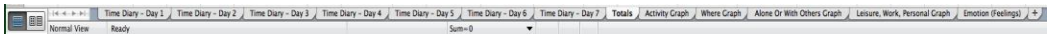
Appendix D

Time Diary Procedures

Thank you for helping us with this research project.

The next step in participation is to track your activities over the course of the next seven days. On the time diary Excel file attached to this e-mail you will find (at the bottom) several tabs. There will be one tab for each of the seven days and a few others:

- Time Diary – Day 1
- Time Diary – Day 2
- Time Diary – Day 3
- Time Diary – Day 4
- Time Diary – Day 5
- Time Diary – Day 6
- Time Diary – Day 7
- Totals
- Activity Graph
- Where Graph
- Alone Or With Others Graph
- Leisure, Work, Personal Graph
- Emotion (Feelings)

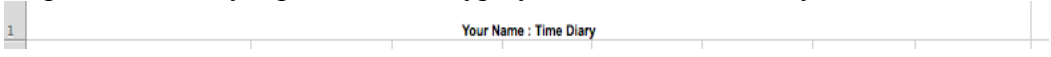


The only tabs you need to worry about are the ones that say “Time Diary” and the one that says “Totals”. The others are for research and data collection purposes. You don’t need to worry or do anything with those at all.

Note. When you first open the Excel file, choose to **Enable Macros** so data can be entered and calculated.

On Day #1: Open the Excel worksheet and click on the tab “Time Diary – Day 1”.

- Step 1: At the very top of the form type your name where it says “Your Name”.



- Step 2: Fill in the date on the line below where it says “Date:”.

2	Date:

- Step 3: “Time Started” - No matter when you wake up and start the time diary on the first day, the Time Started on the first line will be midnight.

3	Time Started	Time Ended	What did you do?	Where?	Who with?	Doing anything else at the same time?	How are you feeling?	Time Spent (Hours)	Leisure, Work, Personal
4	12:00 AM								

  - If you were sleeping from midnight until 8:00am, then put 8:00 AM in the “Time Ended” column. Use this exact format (8:00 AM) so the time spent can be calculated via macros automatically.
  - 8:00 AM will automatically become the start time for the next activity.
- Step 4: Click on the “What did you do?” column. When you do this you will have the opportunity to choose from some selected options by clicking on the double arrow drop down menu to the right of the box.

Time Started	Time Ended	What did you do?
12:00 AM	8:00AM	
8:00AM		

Drinking
Sleeping
Playing Game
Eating
Watching TV
Facebook
Activity 7
Activity 8
Activity 9
Activity 10
Activity 11
Activity 12

  - If what you were doing isn’t an option in the menu, go to the “Totals” tab and type the activity in one of the lines that contains “Activity ___”. Then the activity will appear in the drop down menu as an option for you in the future. For example, shopping is not on the drop down list, so you would type “shopping” in the cell that currently says “Activity 8”.

Leisure, Work, Personal Maintenance

Leisure	0	hours
Work	0	hours
Personal Maintenance	8	hours
	0	hours

Activities			Places			People			Feelings		
Drinking	0	hours	Home	8	hours	Alone	8	hours	Happy	0	hours
Sleeping	8	hours	Work	0	hours	Who 2	0	hours	Mad	0	hours
Playing Game	0	hours	School	0	hours	Who 3	0	hours	Sad	0	hours
Eating	0	hours	Car	0	hours	Who 4	0	hours	Lonely	0	hours
Watching TV	0	hours	Grocery Store	0	hours	Who 5	0	hours	Tired	8	hours
Facebook	0	hours	Bar	0	hours	Who 6	0	hours	Awake	0	hours
Nothing	0	hours	Place 7	0	hours	Who 7	0	hours	Feel 7	0	hours
Activity 8	0	hours	Place 8	0	hours	Who 8	0	hours	Feel 8	0	hours
Activity 9	0	hours	Place 9	0	hours	Who 9	0	hours	Feel 9	0	hours
Activity 10	0	hours	Place 10	0	hours		0	hours		0	hours
Activity 11	0	hours	Place 11	0	hours						
Activity 12	0	hours	Place 12	0	hours						
Activity 13	0	hours	Place 13	0	hours						
Activity 14	0	hours	Place 14	0	hours						
Activity 15	0	hours	Place 15	0	hours						
Activity 16	0	hours	Place 16	0	hours						
Activity 17	0	hours	Place 17	0	hours						
Activity 18	0	hours	Place 18	0	hours						
Activity 19	0	hours	Place 19	0	hours						
Activity 20	0	hours	Place 20	0	hours						
Activity 21	0	hours	Place 21	0	hours						
Activity 22	0	hours	Place 22	0	hours						
Activity 23	0	hours	Place 23	0	hours						
Activity 24	0	hours	Place 24	0	hours						
	0	hours		0	hours						

- Step 5: Continue to fill out the other columns for the activity: “Who with?”; “Doing anything else at the same time?”; “How are you feeling?”; “Leisure, Work, Personal”. You may consider that an activity such as using the Internet is work in one instance, but instead leisure, or personal maintenance in other entries. Again, there will be a drop down menus for these options or you can type your own novel answer in the graphs on the “Totals” page).

- Step 6: “Time Spent” will be calculated by counting the number of hours and minutes spent on the activity.

Time Started	Time Ended	What did you do?	Where?	Who with?	Doing anything else at the same time?	How are you feeling?	Time Spent (Hours)	Leisure, Work, Personal
12:00 AM	8:00AM	Sleeping	Home	Alone	Nothing	Tired	8.00	Personal Maintenance
8:00AM								

Repeat steps 3-6 for all 24-hours of Day 1.

Repeat all steps (1-6) for Days 2, 3, 4, 5, 6 and 7.

Please let Dr. Finke (enh109@psu.edu) or Dr. Hickerson (bdh14@psu.edu) know if you have any questions or are unsure of how to begin with this time diary. We would be happy to answer any questions or set up a time to Skype to walk through an example with you.

Again, thank you so much for helping with this project. We really appreciate it. If we don’t hear from you first, we will be in touch in a few days to see how it is going.

Skype interviews will be scheduled following the submission of the time diary sheet.

Appendix E

Interview Questions

Interview Questions – Serious Leisure Video Game Project

1. How long have you played video games?
    a. How old were you when you started playing video games?

2. How often do you play video games?
    a. What proportion of the time do you play with friends?
    b. How long do you play, on average, at a time?

3. Are there times in your life when you play more or less? Why?
    a. Have there been life events associated with these engagement shifts? Describe them.
    b. Has anything ever kept you from playing video games?

4. What video games do you play?
    a. How do you decide which game to play?
    b. How do you decide to try a new game or new type of game?
    c. How many different games? How many different types?

5. Are you a member of a group based specifically on engagement with video games?
    a. Video game club (physical environment)
    b. Video game guild or clan (virtual environment)

6. Why do you play video games?
    a. What triggers the desire to engage with video games?
        i. To meet/achieve a goal
        ii. Stress
        iii. Boredom
        iv. Need for stimulation/challenge
        v. To escape or take a break

7. Do you think playing video games affects your social life?
    a. Do you ever play with other people?
        i. Familiar people (acquaintances, friends)
        ii. Unfamiliar people (strangers)

8. Do you feel closer to people (friends) who play the same video game(s) you prefer to play?

9. What video game mannerisms (behaviors) carry over into your real life?
    a. Manner of speaking
    b. Manner of dressing
    c. What outward signs do you display that you like to engage with video games?

10. How do you express your emotions when engaging with video games?
    a. Do you consider yourself and emotional video game player?

11. How does playing video games make you feel?

12. What is your favorite video game moment or memory? Why?

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EDUCATION

Pennsylvania State University – University Park May 2014
B.S. in Communication Sciences and Disorders
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PROFESSIONAL EXPERIENCE

Teaching Assistant – Clinical Phonetics Fall 2013
Pennsylvania State University

Intern September 2009 – June 2010
New Bridge Center, River Edge, NJ 07661

- Worked in a classroom for students with autism as a Teaching Assistant
- Shadowed and worked with the Speech-Language Pathologist on site
- Read and learned about Individualized Education Programs (IEPs)

RESEARCH EXPERIENCE

Research Assistant Spring 2013 – Present
Pennsylvania State University

McNair Summer Research Program Summer 2013
Pennsylvania State University

Summer Research Opportunities Program Summer 2012
University of Illinois – Urbana-Champaign

POSTERS AND PRESENTATIONS

Murillo, A. (2013, July). *Access to Quality Caregiver Resources: Assessing the Role of Race and Economic Status in the Personal Experience of Parents Raising Children with Autism Spectrum Disorders* Paper presented that the McNair Summer Research Symposium. University Park, Pennsylvania

Murillo, A. (2012, July). *Parental Perspectives: How African American Parents Perceive Autism.* Paper presented at the SROP Summer Research Conference. Urbana-Champaign, Illinois

Murillo, A. (2012, July). *Parental Perspectives: How African American Parents Perceive Autism.* Poster presented at the SROP Summer Research Conference. Urbana-Champaign, Illinois

CONFERENCES

Campus Ambassadors Conference November 2-3, 2012
Virginia Tech, Blacksburg, VA 24061

26th Annual Graduate Opportunities Conference February 17-19, 2012
National Conference on Higher Education, Philadelphia, PA 19103

Robert D. Lynch Leadership Conference November 4-6, 2011
Pennsylvania Black Conference on Higher Education, Altoona, PA 16601

AFFILIATIONS

National Society of Collegiate Scholars, Member Fall 2011 – Present
Student Minority Advisory and Recruitment Team (SMART) Fall 2010 – Present
- Executive Board member Fall 2011 – Spring 2013

National Student Speech Language and Hearing Association, Member Fall 2011 – Present
Health and Human Development Honor Society Spring 2012 – Present

VOLUNTEER EXPERIENCES

Teaching Assistant Spring 2014
Skills of Central Pennsylvania, Inc.
- Conducted classroom activities with adults with special needs
- Utilized activities aimed at improving skills such as reading comprehension, phonemic awareness and expressive vocabulary

Tutor Fall 2012 – Fall 2013
MidState Literacy Council
- Helped an English Language Learner develop communication skills

Student Mentor Fall 2012 – Spring 2013
LifeLink PSU
- Served as classroom support for a student with a disability
- Assisted as instructional aide for assignments and projects

HONORS AND AWARDS

Waypaver Award Recipient	Spring 2013
Sigma Alpha Pi Honor Society	Spring 2012 – Present
McNair Scholar	Fall 2012 – Present
Schreyer Honors Scholar	Fall 2012 – Present
Tewksbury Scholarship Recipient	Fall 2011 – Spring 2013
Bunton-Waller Fellow	Fall 2010 – Present
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Commons Desk Attendant Fall 2012 – Fall 2013

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