

## “To be quite honest, if it wasn’t for video games I wouldn’t have a social life at all”: Motivations of young adults with autism spectrum disorder for playing video games as leisure

By: Erinn H. Finke, [Benjamin D. Hickerson](#), and Jennifer M. D. Kremkow

Finke, E., Hickerson, B., & Kremkow, J. (2018). “To be quite honest, if it wasn’t for video games I wouldn’t have a social life at all”: Motivations of young adults with autism spectrum disorder for playing video games as leisure. *American Journal of Speech-Language Pathology*, 27(2), 672-689. doi:10.1044/2017\_AJSLP-17-0073

Made available courtesy of the American Speech-Language-Hearing Association:  
[http://dx.doi.org/10.1044/2017\\_AJSLP-17-0073](http://dx.doi.org/10.1044/2017_AJSLP-17-0073)

\*\*\*© 2018 American Speech-Language-Hearing Association. Reprinted with permission. No further reproduction is authorized without written permission from the American Speech-Language-Hearing Association. This version of the document is not the version of record. Figures and/or pictures may be missing from this format of the document. \*\*\*

### Abstract:

Leisure activities are underutilized as a context for intervention in the field of speech-language pathology despite the fact that leisure can be an important context for skill development. The current study investigated the perceptions of individuals with autism spectrum disorder (ASD) who play videogames as their primary leisure activity regarding the role of videogames in their lives and their motivations for playing videogames. Qualitative interview methodology was used to investigate the experiences of 10 18-24-year-olds with ASD. Information was collected about the role of videogames in the lives of adolescents and young adults with ASD and the perceived benefits of playing videogames. Results indicated the participants perceived playing videogames to have a positive impact on their lives and their development. The motivations for playing videogames described are similar to those reported by typically developing populations. Videogaming is a popular leisure pursuit for adolescents and young adults with and without ASD. Speech-language pathologists should consider how videogame play may be a useful context for teaching new communication, social, and language.

**Keywords:** autism spectrum disorder (ASD) | video games | communication | social skills

### Article:

Humans communicate with each other across time and space and within a specific context (Bronfenbrenner, 1979, 1988). The context of interactions directs how communication occurs, the content of the message, and the recipient of the message. It is through these direct interactions with other people that new learning and development transpire (Bronfenbrenner & Morris, 1998; Hoff, 2006). Arguably an optimal context for communication, development, and learning would be one selected specifically on the basis of the motivation and interest of the

learner (Deci & Ryan, 2000; Gee, 2009). Though motivation and interest can occur anytime, they are likely to occur within the context of leisure (Chen, Li, & Chen, 2013).

## **Leisure in Adolescence and Young Adulthood**

Engagement in leisure activities is important for development during adolescence and young adulthood just as much as in other stages of life. It has been suggested leisure activities that involve challenge, effort, and/or concentration may provide developmental benefit for adolescents and young adults (Barber, Stone, Hunt & Eccles, 2005) because of the personal investment these types of activities require. Tuggle et al. (2016) stated:

Adolescents need both stability and change during this developmental period of growth and transformation when they are trying to maintain meaningful connections with their past, establish stable goals for the future, and develop interpersonal relationships in the present. (p. 376)

The transition to adolescence and young adulthood requires major adjustments in daily life and necessitates the development of new skills and the ability to cope with new experiences (Lenz, 2001). Leisure activities provide opportunities for adolescents and young adults to exert voluntary control during this time of transition in ways other contexts in their lives may not (Tuggle, Kerpelman, & Pittman, 2016). Leisure behavior is central to two primary developmental tasks during adolescence and young adulthood, that is, forming a personal identity and exploring and developing a variety of relationships (Raymore, Barber & Eccles, 2001). For this reason, a large portion of adolescents' unstructured time is spent engaging in shared leisure activities with close peers (Mathur & Berndt, 2006).

### **Videogames as Leisure in Typical Development**

One popular leisure activity the adolescent and young adult demographic frequently shares with friends is playing videogames (Ferrar, Olds, & Walters, 2012; Tuggle et al., 2016). Videogames are a pervasive form of leisure in American society. It has recently been reported at least 65% of U.S. households own a gaming console or other device, and 63% of U.S. households include a member who plays videogames regularly, that is, three or more hours per week. Further, there is substantial evidence videogames are a social leisure activity, as 48% of the most frequent videogamers play social videogames and 54% of the most frequent videogamers play videogames with other people, including friends and family members. Twentyseven percent of the people in the United States who play videogames regularly are under the age of 18 years (Entertainment Software Association, 2016).

Until recently, most of the studies of videogaming as a leisure activity have focused on potential negative effects as a result of exposure to inappropriate game content (Markey & Markey, 2010; Olson et al., 2007). However, some researchers have begun to investigate the potential benefits and educational uses of videogames. This line of inquiry has its roots in studies focused on determining why adolescents and young adults are motivated to play videogames. Olson (2010) identified several motivations for videogame play for adolescents with typical development. The results of her large study indicated adolescents experience social motivations for videogame play

(i.e., hanging out with peers, increasing social status through competition and winning, teaching others how to play the games they enjoy, making friends, having opportunities to develop leadership skills), emotional motivations for playing videogames (i.e., using videogame play to regulate feelings and relax, using videogames as an immersive experience), and intellectual and expressive motivations for playing videogames (i.e., challenge and mastery, having the opportunity to express themselves creatively, experimenting with different identities, learning new skills). These motivations may or may not hold for populations of adolescents and young adults who are not developing typically—even when interest in videogames as a leisure activity is similar.

## **Adolescents With Autism Spectrum Disorder**

Videogame play is not only a popular social and leisure activity for adolescents and young adults who are developing typically, but videogaming is also a motivating activity for individuals with autism spectrum disorder (ASD), which is supported by their parents (Finke, Hickerson, & McLaughlin, 2015). This may be important for speechlanguage pathologists to consider, as motivation is an important component of intervention activities for individuals with ASD (Koegel, 2000). Active engagement leads to decreased aversive behaviors, improved generalization, and increased use of verbal expression (Koegel, 2000), all of which are known areas of challenge for those with an ASD diagnosis (American Psychiatric Association, 2013). Further, adolescents with ASD have indicated they spend the majority of their time with their friends playing videogames and other board games (Bauminger & Kasari, 2000; Bauminger & Shulman, 2003; Kuo, Orsmond, Coster, & Cohn, 2013) and have greater overall companionship with the friends with whom they spend time playing videogames (Kuo et al., 2013). As social difficulties are central to the ASD diagnosis (American Psychiatric Association, 2013), activities that are preferred by individuals with ASD for improving or increasing social interactions and social relationships warrant further attention and consideration in terms of their clinical utility and their role as a context for development more broadly.

## **Autism and Videogames**

Previous research, though minimal, has determined part of the appeal of videogames for individuals with ASD is the challenge associated with the videogame play itself. Children with ASD face many challenges in their everyday lives and in school contexts; therefore, is it possible that the challenges presented in videogames may be more manageable, enjoyable, or rewarding than other tasks they are presented with throughout the day (Durkin, Boyle, Hunter, & Conti-Ransden, 2013). Some individuals, particularly individuals with ASD, can become superior, expert videogame players, which could result in higher levels of social interaction and self-esteem (Durkin et al., 2013). There is modest evidence that videogame play does, in fact, serve a social function for individuals with ASD and could be a gateway to interaction and communication with peers with typical development (Carrington, Templeton, & Papinczak, 2003; Winter-Messiers, 2007).

Limited information is available in the published literature regarding the factors that contribute to the interest people with ASD have in videogames and why playing videogames is such a motivating leisure activity for them. It has been suggested videogames could be a motivating and

interesting leisure pursuits for individuals with ASD because they play to strengths in visual attention and processing possessed by some people with ASD (Pellicano, Maybery, Durkin, & Maley, 2006; Shah & Frith, 1993). It has also been suggested videogames may help people with ASD circumvent difficulties with imaginative play (Jarrold, Boucher, & Smith, 1993) and executive functioning (Rosenthal et al., 2013) by offering well-defined, structured environments with clearly defined expectations and frequent reinforcement.

Mazurek, Engelhardt, and Clark (2015) took initial steps in trying to understand the motivations for videogame play among individuals with ASD. These researchers asked adults with ASD four questions about their preferences and motivations for playing videogames (i.e., [a] Why do you play videogames? [b] What is your all-time favorite videogame? [c] What did you like about your alltime favorite videogame? and [d] What do you dislike about videogames?). Results from this study indicated adults with ASD play videogames for a variety of reasons, including stress relief, immersion, social interaction, achievement, creativity, and mental stimulation (among others).

The current study extends the results reported by Mazurek et al. (2015) by exploring not only the motivations of individuals with ASD for playing videogames in their leisure time (e.g., why they do or do not like playing videogames) but also the role of videogames in the lives of adolescents and young adults with ASD more broadly-their perceptions of the effects of playing videogames on their social life, school, and/or work choices and how they present themselves in terms of their identity. Though evidence would suggest that videogame play could present some challenges for adolescents and young adults with ASD (Durkin, 2010), it appears that, on the basis of the evidence to date, individuals with ASD engage with videogames in their leisure time nevertheless (Finke, Hickerson, & McLaughlin, 2015; Mazurek & Engelhardt, 2013). A better understanding of the experiences and motivations of people with ASD who play videogames as their primary form of leisure could help educators and service providers understand this activity as a context for development and the types of learning people with ASD report takes place when they play videogames. Though more research is needed to determine the play patterns (Finke, Wilkinson & Hickerson, 2017) and the perceptions of people with ASD regarding the role of videogames in their lives, the evidence from the literature to date suggests that the appeal of videogames must outweigh the challenges (Durkin, 2010), which in and of itself is clinically meaningful.

## Current Study

In light of the paucity of information in the current published literature regarding the perceptions of individuals with ASD on the role of videogames in their lives and the benefits they perceive from playing them, the current study answered the following research questions: (a) what are the perceptions and experiences of individuals with ASD related to playing videogames as a leisure activity; (b) what is the role of videogames in the lives of adolescents and young adults with ASD in terms of developing their identity and social relationships; and (c) do individuals with ASD perceive benefits from playing videogames?

## Method

## **Design**

The purpose of this investigation was to better understand the experiences of individuals with ASD who play videogames as their primary form of leisure. Achievement of the research objectives required gathering information about personal experiences. For this reason, a qualitative research methodology was chosen (Meline, 2006). Although many types of qualitative research exist (Bernard, 2012), the particular technique determined to be most appropriate for this study was interviewing participants using a semistructured interview format. Semistructured interviews provided some organization and consistency between interviews while allowing participants to describe and expand on their experiences (Morse & Field, 1995). Follow-up questions were asked to probe for additional information and clarify statements made by participants.

## **Participant Recruitment**

Purposive sampling was used to recruit participants with knowledge and experience related to the research questions (Creswell, 1998). In order to be included in the study, an individual needed to meet the following criteria: (a) be a person with ASD who plays videogames regularly (average of at least 1 hr per day or at least 7 hr per week), (b) be between the ages of 18-24 years, (c) be fluent in English, and (d) consent to participate in this project.

Recruitment began at a university campus through fliers attached to bulletin boards in campus buildings, contacting campus clubs involved with videogaming, and contacting the Office for Disability Services. The campus clubs and Office for Disability Services were asked to e-mail information about the study to constituents who may meet the inclusion criteria. Secondary recruitment efforts included posting information about the research project on various videogame websites and forums. Information about the research project was also posted in relevant groups on social media sites (e.g., groups for young adults with ASD) with permission from an administrator. Interested potential participants were provided the contact information for the primary investigators (first and second authors) and asked to contact them for more information. Following initial contact, the primary investigators sent the potential participant a demographic questionnaire. Those who met all of the inclusion criteria were able to continue with the rest of the study. Through this process, a total of 10 individuals with ASD were recruited to participate in the qualitative interviews.

## **Participants**

Data for the larger study were collected from individuals with and without ASD; however, only data from those with ASD will be presented herein. The included participants ranged in age from 18 to 24 years with an average age of 21 years. Nine of the 10 participants were male, denoting a disproportionately large male representation compared with the overall demographics of individuals with ASD broadly. All but one of the participants were White, and all but one of the participants were not Hispanic or Latino. Nine of the 10 reported a diagnosis of Asperger's syndrome, whereas the other one had received a diagnosis of autistic disorder, prior to both of these diagnostic categories being removed with the publication of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (American Psychiatric Association, 2013).

Participants' ASD diagnoses were self-reported, along with the type of medical professional who originally made their diagnosis (i.e., psychiatrist, developmental pediatrician, general pediatrician) and the age at which their ASD diagnosis was obtained. The quantity of time spent playing videogames per week ranged from 7 hr to 53 hr, with an average of approximately 26.8 hr per week and 3.8 hr per day. Table 1 presents a composite of this information, including the self-reported severity of diagnosis and preference for gameplay.

## **Materials**

The data presented in this report are part of a larger investigation on young adults' perceptions of positive or negative impacts of videogames on social relationships and interactions. Data from the larger study include a weeklong time diary, the Serious Leisure Inventory and Measure (SLIM) questionnaire (Gould, Moore, McGuire, & Stebbins, 2008), and qualitative interviews. The data from the interviews are the primary data set for the current project, but a summary of SLIM ratings for each serious leisure quality on a 9-point scale (completely agree, mostly agree, moderately agree, slightly agree, neither agree nor disagree, slightly disagree, moderately disagree, mostly disagree, completely disagree) can be found in Table 2. Higher SLIM ratings (5 or higher) indicate more serious interest, involvement, and personal identification with the leisure activity. Interested readers are directed to Gould et al. (2008) for information about the design and function of the SLIM questionnaire.

Interview questions were used to guide the discussion of the research topic and were generated based on a review of relevant literature on social relationships (Kuo et al., 2013; Stebbins, 1982), videogaming (Mazurek & Engelhardt, 2013; Mazurek & Wenstrup, 2013), and serious leisure (Gould et al., 2008). See the Appendix for the Interview Guide. The interviews with the participants were conducted via Skype (Microsoft, version 7.59.37) and either audio- or videorecorded using the QuickTime Player application (Apple, version 10.4). Members of the research team transcribed all interviews verbatim using Microsoft Word documents (version 16.9.1).

## **Procedure**

Upon receiving approval from the office of research protections at the university, recruitment commenced. When an interested participant, who met all of the inclusion criteria, was identified, he or she provided informed consent to participate in the study, and a time was scheduled for the interview to take place.

Before beginning the interview, the participant was provided the opportunity to ask questions regarding any aspect of the study. Once all questions were answered, the interview began by asking a series of questions about the participant's history playing videogames (e.g., How long have you played videogames?). Follow-up questions addressed the participant's videogame play behaviors and how playing videogames as their primary form of leisure was incorporated into their daily lives. All interviews lasted approximately an hour.

**Table 1.** Participant demographics.

<b>Name</b>	<b>Sex</b>	<b>Age</b>	<b>Degree currently pursuing</b>	<b>Ethnicity</b>	<b>Racial background</b>	<b>Autism spectrum disorder diagnosis (ASD Dx)</b>	<b>Age at diagnosis (Dx)</b>	<b>Severity (self-rated)</b>	<b>Hours/week of videogames</b>	<b>Days/week of videogames</b>	<b>Prefer to play</b>
Martin	M	18	High school	Not Hispanic or Latino	White	Asperger's syndrome	8	Mild	15	7	Alone
Shaun	M	24	Associate degree	Hispanic or Latino		Asperger's syndrome	21	Moderate	30	7	With others in person
Christian	M	22	Bachelor's degree	Not Hispanic or Latino	White	Asperger's syndrome	11	Mild	20	7	With others online
Rachel	F	24	Master's degree	Not Hispanic or Latino	White	Asperger's syndrome	20	Moderate	7	4	With others in person
Josh	M	22	None-completed high school	Not Hispanic or Latino	White	Asperger's syndrome	12	Mild	20	6	With others in person
Nolan	M	18	Bachelor's degree	Not Hispanic or Latino	American Indian/Alaskan Native	Asperger's syndrome	3	Mild	40	7	With others online
Jeremy	M	18	High school	Not Hispanic or Latino	White	Asperger's syndrome	5	Mild	50	7	With others online
Kaleb	M	24	Bachelor's degree	Not Hispanic or Latino	White	Autistic disorder	2	Moderate	53	7	Alone
Noah	M	24	High school equivalent	Not Hispanic or Latino	White	Asperger's syndrome	10	Moderate	35	7	With others online
Andrew	M	22	Associate degree	Not Hispanic or Latino	White	Asperger's syndrome	9	Moderate	40	7	With others online

**Table 2.** Summary of SLIM data—means.

Question category	Martin	Shaun	Christian	Rachel	Josh	Nolan	Jeremy	Kaleb	Noah	Andrew
Perseverance	8.25	8.00	4.50	7.25	6.75	9.00	9.00	8.50	9.00	8.25
Effort	7.50	6.50	5.25	6.25	8.25	9.00	9.00	8.50	9.00	8.50
Career progress	7.50	9.00	9.00	8.00	9.00	9.00	9.00	8.75	9.00	9.00
Career contingencies	9.00	7.00	9.00	7.25	9.00	9.00	9.00	6.50	9.00	5.00
Personal enrichment	6.25	8.00	7.00	7.00	9.00	9.00	9.00	8.25	9.00	6.00
Self-actualization	4.00	5.25	5.00	6.50	9.00	9.00	8.75	8.00	9.00	7.00
Self-expression abilities	6.75	7.25	5.50	6.50	7.50	8.50	9.00	8.75	9.00	8.25
Self-expression individuality	4.75	6.50	7.75	7.00	8.00	8.00	8.25	8.50	9.00	6.00
Self-image	4.75	7.00	6.00	6.00	9.00	8.75	9.00	7.75	5.00	8.00
Self-gratification—satisfaction	3.25	8.00	9.00	6.00	9.00	9.00	9.00	9.00	7.25	8.00
Self-gratification—enjoyment	9.00	9.00	9.00	8.25	9.00	9.00	9.00	9.00	8.00	9.00
Recreation	8.00	7.25	7.00	7.00	9.00	8.00	9.00	8.50	8.00	3.00
Financial return	1.00	1.00	1.00	2.00	1.00	1.00	1.75	3.00	1.00	1.00
Group attraction	6.25	7.75	4.50	7.00	9.00	3.75	9.00	8.50	9.00	8.00
Group accomplishments	6.25	6.00	8.00	8.00	9.00	5.00	8.75	8.25	8.75	8.00
Group maintenance	6.00	6.00	7.00	5.75	9.00	5.00	9.00	8.75	9.00	7.25
Unique ethos	4.50	5.50	2.00	6.00	9.00	5.75	9.00	7.75	9.00	8.00
Identity	6.75	8.00	9.00	5.00	8.25	6.00	9.00	8.75	8.50	8.00
Overall SLIM scores	6.0972	6.8333	6.4166	6.5000	8.2112	7.3194	8.5277	8.0555	8.0833	7.1250

*Note.* SLIM = Serious Leisure Inventory and Measure.

## Data Analysis

Interviews were transcribed verbatim with all identifying information removed. Actual participant names were replaced with the pseudonyms that appear in this article. Pseudonyms are in no way related to the actual names of the participants to retain their confidentiality. Data analysis followed procedures adapted from grounded theory methodology (Charmaz, 2006; Charmaz & Henwood, 2008) and other published qualitative interview methodologies (Davis & Finke, 2015; Finke, Drager, & Ash, 2010; Finke, Drager, & Serpentine, 2015). A grounded theory data analysis methodology was chosen for these data because one of the main goals of grounded theory is to explain participant experiences related to a phenomenon (Morse & Field, 1995). In this case, researchers sought to describe the experiences of young adults with ASD using videogaming as a leisure activity. First, the interviews were broken down into "thought units" or units a sentence or two in length describing one central idea (McNaughton, Light, & Groszyk, 2001; Vaughn, Schumm, & Sinagub, 1996). Second, the author and a research assistant read all of the interviews and outlined broad themes independently (Charmaz, 2006; Charmaz & Henwood, 2008). They then met to discuss the themes and created operational definitions for each theme. Third, two additional research assistants trained in the operational definitions coded all of the data into the broad themes. Fourth, the data were sorted by theme to check for internal consistency of coding and to determine subthemes (McNaughton et al., 2001). Fifth, the two research assistants independently read and outlined subthemes for each theme. They met to discuss their subthemes with each other and the first author and created operational definitions for each subtheme. Finally, the two research assistants used the operational definitions of the subthemes to further code the data in each theme.

## Reliability



To help ensure accuracy and consistency of the coding, point-by-point interrater reliability was calculated for an average of 31% of the data for each theme and 23% (range = 21%-27%) of the data for each subtheme. The investigators used the following formula to calculate reliability:  $\text{agreements}/(\text{agreements} + \text{disagreements})$ . The interrater reliability for the broad themes was 83%, and the average interrater reliability for the subthemes was 90% (range = 86%-94%). Reliability percentages above 80% are considered to be reliable and not likely to happen by chance (Law & MacDermid, 2008). Additionally, Cohen's kappa was calculated for each theme and subtheme. Cohen's kappa is a more robust measure of agreement, scores ranging from 0 to 1 with numbers closer to 1 indicating more agreement (Carletta, 1996). For the themes, the Cohen's kappa was .75 and was .90 (range = .86-.94) for the subthemes. Cohen's kappa values between .75 and .90 are considered substantial according to Landis and Koch (1977).

**Table 3.** Summary of coding and examples from participants.

<b>Themes</b>	<b>Subthemes</b>	<b>Examples of issues discussed by participants</b>
Friendship	Play	Playing with new people; not well known Playing with established friends
	Talk	Something to talk about with new friends Conversations with friends about a shared interest Talking with friends while playing a videogame together
	Social impact	Descriptions of people who are good gaming partners Meeting new people and having the opportunity to gain new friends Positive impact of playing videogames on their social lives
Emotion	Calm	Feeling relaxed Using videogames to unwind Videogames as stress relief Videogames are calming
	Frustration	Not doing well in the game or not accomplishing something desired Not winning Playing a game you do not really like
	Happy	Having fun Getting a new game Beating a level; accomplishing a goal Opportunities for social interactions
Functioning and Skill	Cognitive skills	Improved focus/attention/perseverance Improved problem-solving Improved processing
	Physical skills	Improvements in game mechanics Building motor automaticity Improved reflexes
	Academic/career skills	Impact of videogames on school and vice versa Videogames as topics for school projects Effect of videogames on choice of career
Escape and being creative	Having new experiences	Trying things outside the everyday Seeing different worlds
	Escaping the “real world”	Avoiding the pressures of “real life” Always get a second chance Takes mind off troubles

## Results

This section presents the results from interviews with young adults with ASD regarding their perceptions of the role of videogames in their lives. This study specifically focused on the

participants' experiences playing videogames as a leisure activity and their perception of the benefits derived from this leisure pursuit. The participants discussed playing videogames for leisure in terms of the impact this activity had on (a) their friendships and social networks, (b) their emotions, (c) their functioning and skills, and (d) escaping and being creative. See Table 3 for a summary of the coding and examples of subthemes from participants. Overall, the participants viewed their time spent playing videogames as a positive aspect of their lives.

## **Friendship**

All of the participants discussed friends and friendships they felt were associated with playing videogames for leisure. Comments coded as "friendship" were those thought units about a positive or negative experience regarding communication with others, friends, or their social life directly resulting from playing videogames. Examples include, but were not limited to, making/meeting new friends, discussing games with others either online or in person, hanging out with others who play videogames, teaching other people to play videogames, and the impact of videogames on their social life. Subthemes for this code included "play," "talk," and "social impact."

## **Play**

Comments about playing videogames with people or friends were coded as "play." The participants talked about playing videogames with established friends and also with people they did not know at all, or very well.

*Acquaintances.* Andrew talked about playing with people he does not know well. He said, "I play with people that I meet online, so I guess I'm usually a solo player, but I play multiplayer. I just compete, but I'm not part of any clans." He went on to add, "I don't have any serious friends online. I try to play with as many people as I can and see how they play." Josh also talked about playing videogames online with people he does not know well. He commented:

That's a group where people play on that specific server every day whenever they want. And then random people join the game too, so there are regular players and random players. So, sometimes you play with the same people and there are also random people mixed in.

Martin commented he would also play videogames with people he does not really know. He said, "With Awesome Knots it's only online, so, I usually play a couple matched games a day, so I'll play with random people." Martin also reported having an experience with a videogame club at school where he would play with people he knows well and also with people he knows less well. He described the experience in this way:

The school has a game club. The whole school centers on kids with Asperger's, there's like 22 students, so about half the students or more really enjoy videogames. So, we have playing parties at school or at one of the kid's houses.

Martin also recounted a memory of a time when playing videogames with a random stranger became a really fun day. He said, "I remember one time I had a layover in an airport, and there was another kid with a [Nintendo] DS. We played Mario Kart together. It was great fun."

***Friends.*** Other participants discussed preferring to play videogames with familiar partners and friends. For example, Rachel stated, "I like to play videogames by myself and I like to play games that I can play with my husband, but never more than two players at a time. It's always just one or two." Jeremy echoed the idea of liking to play with people he knows well. He said, "I like to play with friends. They come over to my house. I play with my friends and with my siblings." Kaleb also talked about the enjoyment he feels at playing videogames with friends:

Basically as long as I can remember, although I never really had my own gaming system until just before high school, I would always go to a friend's house to play videogames. This is just something I got hooked on when I was really young.

Noah also discussed playing videogames with his friends. He described his experience as being one of solidarity and confirming the similarity between himself and his friends:

And we just kind of hang out and bring our game systems and some games and whatever, and we play videogames-it's either two or three times per year. That's always kind of a fun experience, to hangout with someone else that is just as crazy as I am.

Shaun corroborated this idea that playing videogames can be the glue that holds friends together. He described his experience:

And so we're all in school and stuff, so during the week we play online and then during the weekend is when we get together. I usually drive back up there cause they are both living in [name of town]. So, I go up on weekends and hang out with them.

Talk

Comments about talking with other people about videogames, including talking with friends and others online, in person, and using videogames as a topic of conversation, were coded "talk."

***Initiating interactions.*** Several of the participants discussed using videogames as a way to initiate or continue an interaction with another person. For example, Andrew shared, "if there's nothing to talk about, I'll usually bring up videogames. I'll tell them what kind of games I like." Christian mentioned feeling more cautious about bringing up the topic of videogames when he said, "I'm really careful that I try not to overwhelm people with the subject of conversation." Martin also commented he is willing but cautious about talking about videogames in social settings. He stated, "I am usually not the first person to bring 'em up. Usually if games are prevalent, usually they will bring it up first."

Josh also talked about using the topic of videogames as a way to build social connections. He said, "I try to keep it so people can understand, if I'm talking to someone who's never heard about videogames. I say terminology that would be related to things the person should know from real

life." Noah likened talking about videogames to talking about other popular interests, "it's like a lot of people get into sports-well, you can always talk about sports. I think you can also always talk about videogames 'cause there is a good chance that the person you're talking to is really going to like videogames." Shaun also discussed videogames as a way to initiate a social interaction. He specifically talked about videogames being the "hook" for starting a new friendship. He stated:

If I meet someone new and they like videogames, well, we can talk about that, and maybe play together. I think that has helped me a little bit. If one of their interests is videogames then that can help me connect with them, because connecting with people is really difficult for me.

Alternatively, Rachel mentioned the opposite perspective; many people may not understand or like videogames. She mentioned she talks about videogames to dispel myths and convince others of their value. She said, "Sometimes I meet people that are like, 'what do you see in that [videogames]' and I'm like, 'what don't you see in that?', you know?"

***Talking with friends.*** The participants also discussed talking about videogames with their friends. Shaun talked about this when he stated:

We get in the group private chat, we talk amongst ourselves, and then we just go online as a group. . . . It's definitely good since I can't hang out with my friends in person all the time. We can get online and play and stuff.

Josh also discussed talking with his friends about videogames online. He said, "we [my friends and I] talk over the game. ... A lot of times people and their friends either talk on a mic or they talk in the chat, if they don't happen to have a mic." Josh further discussed talking with friends about videogames in person. He said, "I like to talk about the Team Fortress 2, and how the game works. I've got one of my friends from school on Team Fortress 2." Jeremy also commented on talking with friends about his interest in videogames. He stated, "[it's] something more to talk about. [We talk about] Super Smash Brothers, or the console that's coming out. Like some facts, we talk about that."

## Social Impact

Any comment related to gaining or making friends because of videogames or while playing videogames was coded "social impact." Comments ranged from descriptions of the types of people the participants like to play videogames with to the viability of videogame play as a context for developing social relationships and to the impact playing videogames has had on their social lives.

***Characteristics.*** Andrew specifically discussed the type of person he likes to play videogames with. He said, "Someone who like, if they share common interests and they're like-I guess they're on my level of difficulty, they're able to help me play the objective." He added he would also care "that they're nice, have a good sense of humor." Christian also spoke about the characteristics of people he would like to play videogames with. He stated:

How they interact during the game is a factor. Somebody who is very funny, obviously. Somebody who is really good at the game might get a friend request. Now I like somebody who's funny, somebody who obviously knows a lot about the game and is happy to explain it. Somebody who is imaginative and explains why they think the game works, and that kind of thing. So, it's not entirely about the game player ability. It's often about how fun is the person to be around.

Josh also discussed the type of people he likes to play videogames with on a regular basis. He stated, "I say, 'well, these people are fun to play with' or 'this person is good at this game.'" Martin also made comments about this topic, "I prefer to play with lively players, not somebody- because when I play I'm pretty silent, so I prefer somebody who is lively."

**Gaining friends.** When asked about whether he plays videogames with people he does not know, Christian commented, "Yeah, we call them 'randoms.' They just drop in. You meet them and you hope they're good and sometimes you become good friends." Kaleb commented about his feelings that certain games help him make friends. He said, "I suppose with certain games, like Super Smash Brothers, it does help me to make a few friends. It's multiplayer games, I guess. There's a possibility of making good friends that way." He added to this idea when he said:

I imagine because you're interested in this particular game and that person is interested in that game, it just, I don't know, it seems like common ground to be friends on. Something like that.

Noah also commented on the social potential of playing videogames. He stated, "So many people get into it [playing videogames] just to hang out with people. It's kind of a social thing." Nolan also commented on the social nature of playing videogames. He said, "It's a shared interest, right? That's probably as deep as that answer goes. It's just, I mean, you take all the normal social skills and you introduce a shared interest." Shaun expressed a similar idea to Nolan; he said, "It's pretty hard for me to make friends, you know, to connect with people. But, if they have that common interest, I'm more likely to open up and talk to them."

**Social lives.** Many of the participants in this study expressed ideas related to the impact of playing videogames on their social lives. The experiences of the participants indicated their perception that videogames have affected their social experiences positively. Christian summed this up best when he said, "Well, I suppose you could say that, to be quite honest, if it wasn't for videogames I wouldn't have a social life at all." Josh expressed the idea that the friends he has made through videogames are extremely valuable to him. He said, "Lots of people I know on the internet are really good friends. I would genuinely miss them if they were to be offline forever." Nolan expressed a similar idea this way, "I don't have any friends in the physical environment. ... My social needs are very small and they are fulfilled through videogaming. ... I met my best friend on World of Warcraft about six years ago." Later in the conversation, Nolan added, "If I didn't have videogames, I probably wouldn't have any friends. So, really, I think it's just been completely positive only."

## **Emotion**

All of the participants discussed emotions associated with and/or experienced while playing videogames for leisure. Comments coded as "emotion" were those thought units about a positive or negative emotion felt as a direct result of playing/interacting with videogames. The primary emotions discussed included feeling calm, frustrated, and/or happy.

## Calm

Comments related to a calming or neutral emotion felt as a result of playing videogames were coded as "calm." Examples included, but were not limited to, expressions about feeling calm, relaxed, using videogames as a way to unwind, and videogames as a source of stress relief. For example, Andrew explained, "It [playing videogames] can make me feel like, if I'm bored, or if I'm not having a good day I guess, I go there and they [videogames] help me feel better." Another participant, Christian, stated playing videogames is "extremely relaxing, while still being interactive." Josh corroborated the idea that playing videogames can be relaxing when he said, "I keep finding the games relaxing if I'm upset about something or other." Jeremy also mentioned a perceived calming effect associated with playing videogames. He said he likes to play videogames because "I guess because there's a calming effect, and that's a hard one [for me]." When asked for more information about the specific aspects of videogames that calm him, Jeremy responded, "When I got the Wii, when the Wii came out, it was about motion, and it was really calming to use the Wii with all the motion controls." In this same way, Christian commented, "Sometimes it [playing videogames] is a coping mechanism." To add to this idea, Martin stated, "When I was switching schools or when school got hard, I'd play [videogames] a bit more, like kind of as a stress relief thing." Shaun also commented about using videogames as a method of getting through difficult situations. He said, "Playing videogames does make me happy, so if I'm feeling sad they have helped me pass through some stuff."

## Frustration

Comments about being frustrated or experiencing other negative emotions while playing videogames were coded as "frustration." This included feelings, such as frustration, anger, and sadness. Some examples include Andrew's comment: "I guess I admit to-I can get a little frustrated every now and then if I don't do well, but mostly I'm calm." Christian talked about experiencing frustration when playing videogames too. He stated he feels frustrated "when I can't accomplish something" and added "that's [frustration] something I'm not very good at handling either." Kaleb added he feels "frustration every now and then when I'm stuck in; stuck on some part that I just, no matter what I do, I just can't seem to get through." Martin added to this idea when he commented, "When I am winning, I feel great. When I am losing, I kind of just flat line." Noah echoed this same cause of negative emotion when he said:

If there's a part that's really difficult... or if there's a part I don't really like, there can be frustration, or aggravation, irritation, fixation, infuriation, that kind of stuff, but it's usually pretty minimal in videogames.

Rachel also added to this idea when she said:

I get frustrated if I'm completely dying or something, and I'm not doing well ... just if I'm not winning. If I haven't mastered how to aim or something like that, I'll be trying and trying-I think my motto is 'practice makes perfect,' so if I keep practicing it I know I can eventually get it.

She did add, though, the following:

One time I got so angry I literally just turned the console off and then I really regretted it because I actually didn't finish, which is not like me. I had to run back and say 'oh my gosh, I don't think I saved [the game].' I was so frustrated I threw the console on the couch and walked away to take a deep breath.

Shaun added a new perspective to some of the negative emotions that can be experienced when playing videogames. He discussed the sadness he feels when a favorite character dies in a game. He explained, "I start connecting with characters, and if one of them dies, if I feel really connected to them, I'll be really sad they're gone. I think Mass Effect is one of the best examples."

Happy

Comments about being happy or experiencing positive emotions while playing videogames were coded as "happy." All of the participants spoke during their interviews about positive emotions experienced while playing videogames. Andrew commented he feels happy and proud of himself "every time I get a new Call of Duty and I prestige. I feel like I achieved something. It's so fun!" Kaleb corroborated feeling positive emotions when accomplishing a challenge within the game when he said, "It's good when I beat a really hard boss, I feel ecstatic." Martin added feeling positive emotions when he gets to play videogames with his friends; he stated, "One time I was playing with one of my friends who drove like six hours to get down for the weekend to hang out with me, so that felt really cool."

Noah took a different approach to explaining the positive emotions experienced during videogame play. He discussed feeling a sense of achievement when he commented:

It [doing well in a videogame] makes me feel like I've achieved something, something greater than I could do in reality. It's empowering, it makes you feel good! It makes you feel like there is something you are good at, it's a cool feeling.

Nolan echoed this sense of accomplishment when playing videogames when he stated, "The best thing is when you spend months progressing with a guild on one boss and you kill it. Months of work nightly, five nights a week, thirty people, same boss, you finally get it." Rachel also expressed positive emotion when recounting an accomplishment during videogame play, she said:

My best memory was when I played on expert level, in Smule. My fingers were flying down the screen so fast and I got three stars on it and I was so proud of myself! I had the highest score out of anyone. I'm talking like worldwide, people go live with this.

Finally, Shaun and Rachel discussed experiencing positive emotions from the nongameplay activities associated with playing videogames as a leisure activity. Rachel commented, "It makes me feel good when I meet someone that shares my appreciation for videogames. It just makes you feel that much better that they understand how special it is." Shaun's comment was about activities related to videogames. He said:

I'm usually looking at videogame news when I browse the Internet. Just seeing what is coming out soon, and anticipating the games when they come out. It's pretty exciting. I like going to conventions. I mean, I haven't been to a lot of conventions, but I've been to some and it's pretty fun.

## **Functioning and Skill**

Another topic discussed by all of the participants during the interviews was the effect of playing videogames on their functioning, skills, or broader life decisions. Generally, the comments coded under this theme were subcoded as "cognitive skills," "physical skills," and "academic/career skills."

### **Cognitive Skills**

Comments coded under this subtheme were those related to the participants' perception that playing videogames affected their mental or thinking skills. Christian provided an example of this when he said, "You do learn things. You do have experiences that you wouldn't gain outside of that, that you can only get through games, and I think you could only gain through videogames." Josh added a slightly different perspective-that playing videogames is more intellectually stimulating than watching TV. He said, "I like playing videogames because sometimes, I just-with TV I just can't really concentrate on it for very long; and with videogames, you have to pay attention, or you're just not playing." Rachel echoed this idea in her interview when she stated, "My ability to pay attention more, I think, has actually increased because of playing videogames because it really requires quite a bit of attention."

Kaleb mentioned the idea that he felt that playing videogames encouraged problem-solving and critical thinking. He said, "Mostly, what's the word? Ponderous. You know, when you stop for a few seconds? Stop to think for awhile and just wonder-what if I try this, or that." Another idea mentioned by a few participants was the idea that videogames allow for a type of learning that tolerates failure. For example, Martin commented, "I guess I enjoy the challenge, and enjoy trying to learn from my defeat." Nolan also said:

I learned to be persistent. ... you just have to keep trying and trying different things and then finally something will work. And then, of course, you move on, and they give you some other challenge ... but as long as you're persistent, you will get it.

### **Physical Skills**



Most of the comments related to this subtheme were related to how the participants' game mechanics had changed and improved over time. For example, Jeremy said:

I've gotten better coordinated, I think. Knowing where the buttons are. An example would be the Nintendo controller. When I started out with the-when the GameCube controller came out- I didn't know where X and Y were and I did not know they were reversed.... Now I know where they are by heart.

Kaleb added to this idea of building motor automaticity with the game controls. He said, "Once you get the hang of a game, it really just becomes something you hardly think about-you just do. ... after a whole lot of practice." Rachel reinforced these ideas when she said:

I think my hand eye coordination wasn't that good when I was younger, but I put a lot of practice in, to use different controllers, the ability to remember all the different-what each button means, what each one, like, represents. I got much better at that.

Shaun added he felt his motor reflexes had improved through playing videogames. He said, "My reaction time, reflexes, have improved. I'm sure I could beat myself if I was playing myself back then [when he was younger]."

#### Academic/Career Skills

The participants talked about the influence of videogames on academic skills in two main ways, through their approach to school and traditional academics and also in their approach to their careers and choosing a career.

***School and traditional academics.*** Christian talked about how his interest in history lessons in school affected the videogames he chose to play in his free time. He said, "I mentioned that I used to play historical strategy games, and it was probably ... a result of that or concurrent with that, I tend to very much enjoy history classes." Noah discussed the impact of videogames on his education when he said:

I learned to spell from playing games. My spelling was horrendous. I was like five years behind in my spelling and writing skills ... and I've always said I learned from online interaction ... the only way I learned how to spell was through repetitive action of typing the words to people or whatever.

Finally, Shaun added the idea that playing videogames provided a topic for writing papers and giving oral presentations for various classes. He said, "I've even written a paper on videogames, a college paper. I wrote on videogame terms and slang. Just different terms that gamers use. I got an A+ on that." He added:

I did a speech on Asperger's, but my final speech was on videogames and how they were good. And since I already did the speech on Asperger's, I kind of put that in my videogames speech, I used this videogames speech to say how a game like this, the

technology, could be used to help people with autism learn about facial expressions and emotions.

**Career decisions.** Many of the participants discussed how their interest in playing videogames affected their choice of career path or planned career path. Christian stated, "I'd like to work at one of those magazines, like Game Informer, and be a critic." When asked what he wanted to do after college, Josh said:

Probably something related to videogame design or computer coding. ... I've found the most appealing jobs you could possibly have, related to videogames, could be like pre-alpha-beta test for motors. Like looking at a game and playing it while it's all buggy and new, then telling them what's wrong, what needs to be fixed, and that sort of thing.

Jeremy stated playing videogames increased his interest in animation. He said, "I want to go into animation, or writing, something like stories because I have a really good imagination." Martin also talked about his future career during his interview. He stated:

Ideally, I want to provide Linux support. Like tech support for Linux or just be like general tech support. I think videogaming has really gotten me interested in technology. Before, I never had an interest in technology, and then I got into PC gaming and that spurred on my technical abilities.

Nolan said he wanted to be an engineer for his profession. He commented, "I mean a lot of the stuff that I see in videogames, a lot of spaceships and a lot of the airplanes, I really want to build that stuff." Rachel's first major in college was also affected by her interest in playing videogames. She said:

In fact, my very first major in college was graphic design and videogame making on the computer. That's what my original major was, and I decided to switch from it, but I had such an interest in it that I decided to pursue it as a career on how to design videogame on the computer.

## **Escape and Being Creative**

The final topic discussed by the participants in the study was the idea of "escape and being creative" in new worlds and with new abilities: using videogames as a method for "getting away" from life. Some examples included discussions about having new experiences and losing touch with the real world.

### **Having New Experiences**

Some of the participants talked about playing videogames as a way to have new experiences and to try things that were not part of their everyday lives. Martin addressed this idea when he said:

It's a chance to explore different things, and experience stuff you wouldn't normally experience. Even if it is a sports game, most people say, 'oh sports games, why don't you just go play the sport?' Well, you're never gonna be able to play it on that level. You're never going to be able to dunk or stuff like that. Well, some people might, but it's not something most people can do. Or play full contact football, or driving these crazy race cars. Not that I want to, 'cause it's kinda dangerous, but virtually, it's great to enjoy.

Nolan mentioned having the ability to see new places when he said, "I can go to places that don't exist." Shaun also mentioned seeing new places through videogames. He commented, "I just love going into these different worlds, and being able to be someone different."

### Escaping the "Real World"

The participants also mentioned playing videogames as a way to get away, to avoid the pressures of "real life," and to reset. Nolan specifically mentioned this:

It's just something that I can do and it's kinda therapeutic because the good guy always wins. ... it's a good way to kind of escape, and that's why I think a lot of people get into it [playing videogames]. ... when I'm getting freaked out, when things are going wrong or when there's just too much stuff happening, it's kind of an escape door.

He added to that idea by saying, "You always get that second chance, you can always keep trying, and there is no punishment for making a mistake, which I don't see enough of outside of videogames." Rachel also mentioned this idea of getting away from the real world when she stated, "It definitely helps take my mind off whatever is going on. I like to sit down on the couch and just play for a little while."

## Discussion

Adolescents and young adults with ASD who play videogames as their primary form of leisure were interviewed about their perceptions, experiences, and motivations for playing videogames. Results from the interviews suggested the participants perceived playing videogames for leisure as a good use of time and to have positive impacts on their lives in several ways. The motivations for playing videogames described by the participants in the current study echo many of the motivations described in the published research literature for individuals without disabilities (Olson, 2010).

### Social Motivations for Videogame Play

Olson (2010) categorized the motivations of typically developing adolescents for playing videogames into three main categories: social, emotional, and intellectual and expressive. The data from the participants with ASD in the current project identified many similar motivations for playing videogames. They certainly expressed the benefits they perceived playing videogames had on their social lives and ability to make friends-"if it wasn't for videogames I wouldn't have a social life" and "I met my best friend on World of Warcraft." The participants in the current study discussed how videogames gave them a topic to talk about with other people, a

common interest, and a forum for interacting with new and established friends that otherwise would not exist.

People with ASD, as a result of their disorder, have difficulty interacting with other people (American Psychiatric Association, 2013) and, as a by-product, establishing friends (Petrina, Carter, & Stephenson, 2014). One of the participants even commented on this difficulty himself, "It's pretty hard for me to make friends, you know, to connect with people.," so the fact that this activity appeared to have such a unanimously positive effect on this aspect of development ("I think it's just been completely positive only"-Nolan) should be compelling to researchers and clinicians alike. The potential of this activity, or any activity with as large a draw for people with and without ASD, to provide a context and opportunity for friendship formation should be considered and explored. In adolescence and young adulthood, leisure activities are supposed to be the context for the development of significant social relationships (Raymore et al., 2001). The results from the current project also corroborate those reported by (Mazurek et al. (2015), who found that adults with ASD liked the social aspects of playing videogames and that videogames could be played with friends. It is encouraging that this may be one way adolescents and young adults with ASD are more similar to their typically developing peers than they are different.

There were some ways, however, the current participants differed from adolescents with typical development in their motivations for playing videogames (Olson, 2010), which could also have an impact on the clinical use of videogames as a context for building social relationships. The participants in the current project did not talk as much about liking to compete when playing videogames. They did mention feeling happy when they would beat a level or a challenging boss ("when I beat a really hard boss, I feel ecstatic"-Kaleb), but competition with others was not an emerging theme. Very few participants in the current study mentioned being motivated to share their knowledge of videogames with other people by teaching them how to play. Josh did mention getting a friend to play the videogames he likes (i.e., Team Fortress 2) but did not really discuss teaching him to play the game.

### **Emotional Motivations for Videogame Play**

Previous research on the motivations for playing videogames has suggested this leisure activity is perceived to be helpful in regulating feelings by helping typically developing players to relax, forget about their problems, work out their anger, and promote positive moods (Olson, 2010). There is some evidence in the data provided by participants with ASD that playing videogames may serve the same function for this population (Mazurek et al., 2015). Many of the participants in the current study discussed the calming effect playing videogames has on them, specifically mentioning that playing videogames helps them to "feel better." The participants in the current study also discussed playing videogames as a way to escape or get away from life. One participant, Nolan, specifically described playing videogames as "therapeutic." Some of the participants also talked about the videogames helping them to take their mind off stressful events--"it definitely helps take my mind off whatever is going on." Again, it is interesting that people on the autism spectrum are motivated to play videogames for similar reasons as those without ASD.

One difference from the findings from Olson (2010) in the current study, and also in the study on adults with ASD (Mazurek et al., 2015), is a discussion of the concept of flow. The participants in the current project did not discuss feeling absorbed in game play or the concept of being motivated by the pleasantly frustrating challenge of a problem that slightly exceeds their skill level (Sherry, 2004). It may be that the participants with ASD simply did not discuss their experiences in this way, or it could be that individuals with ASD experience flow states during videogame play differently or less frequently than gamers without ASD. This should be investigated further in future studies.

### **Intellectual and Expressive Motivations: Videogames as a Context for Development**

Playing videogames appeared to provide the opportunity for the participants in the current study to develop a broad range of skills and abilities. The participants discussed improvements in the motor skills, specifically related to improved ability to navigate and control the videogames and videogame controllers. They also discussed improvements in hand-eye coordination, reaction time, and reflexes. The impact of playing videogames on visual search, hand-eye coordination, reaction time, and other areas of development has been established for typically developing populations (Dye, Green, & Bavelier, 2009; Green & Bavelier, 2003, 2006) but has not been studied empirically in populations with ASD or other developmental disabilities. Further, the typically developing participants in Olson (2010) also reported being motivated by the inherent challenge of videogames and the requirement for continual development of specialized knowledge and skills. These motivations were also reported for adults with ASD who reported liking aspects of playing videogames associated with achievement and challenge, as well as the mental stimulation provided by videogame play (Mazurek et al., 2015).

The participants in the current investigation also discussed the impact of their leisure time activity on their choice of career or educational path. Many of the participants in the current study discussed how their enjoyment of playing videogames affected their choice about careers and academic coursework to pursue. The participants discussed being interested in technological careers, animation or art careers, and even engineering as a result of their interest in playing videogames. The concept of encouraging a person with ASD to translate a leisure or "passion" activity into a career is not new. Temple Grandin has been advocating this idea for years (Grandin & Duffy, 2008), and though Dr. Grandin may not personally advocate for playing videogames, the current study provides initial evidence that this may be a direction for clinicians and researchers to explore further as a method for improving outcomes and capitalizing on abilities in a range of areas for individuals with ASD.

This type of motivation for videogame play has not been reported in the research literature for typically developing populations (Olson, 2010), but may exist. Many people are drawn to careers that build on the skills and knowledge developed during preferred activities. This is the whole notion behind the concept of serious leisure (Gould et al., 2008; Stebbins, 1982), and the literature on the developmental function of leisure activities during adolescence and young adulthood, which is to aid in forming a personal identity and exploring and developing a variety of relationships (Raymore et al., 2001).

The participants in the current investigation also discussed being motivated by the opportunities videogames afford to have experiences that are different from their everyday lives, to go to new places, and to experience the world as different people. This is largely similar to the motivations of adolescents without ASD who have also reported enjoying the experience of different identities and discovery and learning about different cultures, worlds, and people through videogame play (Olson, 2010). An aspect of intellectual and expressive motivations for videogame play for individuals with typical development that were not reflected in the data generated in the current study was the idea of expressing creativity through game "modding" and other forms of game customization (Olson, 2010). Again, this may be too open-ended for individuals with ASD who tend to prefer well-defined structure within their play environments (Jarrold et al., 1993) or simply may not have been mentioned in the context of the interviews for this research investigation.

### **Clinical Implications**

Videogame play is a context for communication and interaction that is prevalent in American society (Electronic Software Association, 2016). A clinical consideration grounded in the data from the current project is the concept of taking what a person is "good at," or interested in, and using that as the center of instruction or communication-based intervention (Hughes, 2017, p. 308). Research in the field of education has begun to link skills learned during videogame play to improved academic and social outcomes (Steinkuehler & Squire, 2013), but these outcomes have not been studied in populations with disabilities, such as ASD.

Speech-language pathologists and other educators should consider how intervention efforts can capitalize on the collateral learning and development that occurs when a person engages in a preferred leisure activity. Motivation is important to learning (Deci & Ryan, 2000) and is a central factor in commitment to engage in new learning activities. Most people choose to develop and focus on tasks and skills at which they excel or are otherwise intrinsically motivated to pursue (Hughes, 2017). Many people with and without disabilities are attracted to and motivated by playing videogames, including individuals on the autism spectrum (Durkin, 2010; Mazurek et al., 2015). Despite this interest in videogames and the demonstrated educational potential of videogames (Squire, 2005; Steinkuehler & Squire, 2013), there is very limited research, to date, related to the positive learning outcomes associated with engagement with videogames for individuals with ASD. This is a missed clinical and academic opportunity and may be a critical factor in improving academic, employment, and social outcomes for people with ASD who play videogames.

Finally, the perceived impact of playing videogames on the friendships and social networks described by the participants with ASD in the current study should not be minimized or overlooked. The difficulties individuals with ASD experience in making and maintaining friendships are well documented, and it is known that people with ASD have the fewest number of friendships of all disability groups (Petrina et al., 2014). Improving outcomes in this area of functioning should be of paramount importance to clinicians and educators as having quality friendships is critical to well-being and can be a significant protector against loneliness and depression (Asher, Parker, & Walker, 1996; Vitaro, Boivin, & Bukowski, 2009). High-quality friendships also serve a protective function from peer victimization and bullying that is not

present in lower quality friendships (Bollmer, Milich, Harris, & Maras, 2005; Waldrip, Malcolm, & Jensen-Campbell, 2008), so potential methods for improving outcomes in this area should be considered carefully and seriously in a clinical capacity.

## **Limitations**

There are some limitations to the current study that may limit the generalization of the findings. First, the results were generated from a limited number of participants (i.e., 10) and may not be representative of the rest of the population of adolescents and young adults with ASD who play videogames as their primary leisure activity. Further, the vast majority of the participants were of White racial background with only one reporting a Hispanic or Latino ethnicity. Also, nine of the 10 participants had Asperger's syndrome, whereas the other was diagnosed with autistic disorder. This may mean that the results are more representative of the experience of individuals whose ASD symptoms are less severe. The level of language used throughout the interviews and the ability to think abstractly during the interview process are further indications that the participants represent the higher functioning portion of the ASD population. Second, the sample included an overrepresentation of males compared with the proportion of males and females in the broader ASD population. Third, the majority of the participants played videogames for a greater-than-average number of hours per week; therefore, results may reflect only the perspectives on those with ASD who play videogames more than occasionally. Finally, readers should consider the presence of self-selection bias in the participant sample. The participants determined for themselves their appropriateness for participation in the current project, and therefore, generalizability of the results may be affected.

## **Future Directions**

Future research should examine the impact of playing videogames on visual search, hand-eye coordination, reaction time, and other areas of development in populations with ASD or other developmental disabilities. Future research should also examine the impact of playing videogames on stress and anxiety in individuals with ASD. It has been reported engagement in leisure activities may reduce stress and anxiety, but it is not known if this is true for videogames explicitly. Related to this, future research should examine the use of videogame play as a method of coping for individuals with ASD. Various types of coping could be explored (e.g., coping with school and job stress, coping with noise or other sensory stimulation, coping with ASD symptoms generally, and coping with general life stress) and would further the knowledge base in the field on the benefits of playing videogames as a leisure activity for people with ASD. Third, future research should examine the utility of videogaming as a context for building new friendships and maintaining established friendships and social connections for people with ASD. Finally, future research should investigate the impact of leisure activities, and playing videogames specifically, on the employment and job choices of individuals with ASD.

## **Summary**

In conclusion, the current study used qualitative research methodology to examine the perceptions, experiences, and motivations of adolescents and young adults with ASD who play videogames as their primary form of leisure. Results indicated the participants perceive multiple

forms of benefit as a result of playing videogames. The data generated by the participants can be used to consider the utility of videogames in coping with or escaping stress, obtaining social support, and making new friends. Speech-language pathologists should consider how videogame play may be a useful context for building on and teaching new communication, social, and language skills to individuals with ASD and other communication-based disabilities, as well as for establishing and maintaining friendships.

## References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Association.

Asher, S. R., Parker, J. G., & Walker, D. L. (1996). Distinguishing friendship from acceptance: Implications for intervention and assessment. In W. M. Bukowski, A. F. Newcomb, & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence* (pp. 366-405). New York: Cambridge University Press.

Barber, B. L., Stone, M. R., Hunt, J. E., & Eccles, J. S. (2005). Benefits of activity participation: The roles of identity affirmation and peer group norm sharing. In J. L. Mahoney, R. W. Larson, & J. S. Eccles (Eds.), *Organized activities as contexts of development: Extracurricular activities, after-school and community programs* (pp. 185-210). Mahwah, NJ: Lawrence Erlbaum Associates.

Bauminger, N., & Kasari, C. (2000). Loneliness and friendship in high-functioning children with autism. *Child Development*, 71(2), 447-456.

Bauminger, N., & Shulman, C. (2003). The development and maintenance of friendship in high-functioning children with autism: Maternal perceptions. *Autism*, 7(1), 81-97.

Bernard, H. R. (2012). *Social research methods: Qualitative and quantitative approaches*. Thousand Oaks, CA: SAGE Publications, Ltd.

Bollmer, J. M., Milich, R., Harris, M. J., & Maras, M. A. (2005). A friend in need: The role of friendship quality as a protective factor in peer victimization and bullying. *Journal of Interpersonal Violence*, 20, 701-712.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.

Bronfenbrenner, U. (1988). Interacting systems in human development. *Research paradigms: Present and future*. In N. Bolger, A. Caspi, G. Downey, & M. Moorehouse (Eds.), *Persons in context: Developmental processes* (pp. 25-49). New York: Cambridge University Press.

Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In W. Damon (Series Ed.) & R. M. Lerner (Vol. Ed.), *Handbook of child psychology, Vol. 1: Theoretical models of human development* (5th ed., pp. 993-1028). New York: Wiley.



Carletta, J. (1996). Squibs and discussions: Assessing agreement on classification tasks: The kappa statistic. *Computational Linguistics*, 22(2), 249-254.

Carrington, S., Templeton, E., & Papinczak, T. (2003). Adolescents with Asperger syndrome and perceptions of friendship. *Focus on Autism and Other Developmental Disabilities*, 18, 211-218.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Thousand Oaks, CA: SAGE Publications, Ltd.

Charmaz, K., & Henwood, K. (2008). Grounded theory. In C. Willig & W. Stainton-Rogers (Eds.), *The SAGE handbook of qualitative research in psychology* (pp. 240-262). Thousand Oaks, CA: SAGE Publications, Ltd.

Chen, Y. C., Li, R. H., & Chen, S. H. (2013). Relationships between adolescents' leisure motivation, leisure involvement, and leisure satisfaction: A structural equation model. *Social Indicators Research*, 110, 1187-1199.

Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: SAGE Publications, Ltd.

Davis, J. M., & Finke, E. H. (2015). The experience of military families with children with autism spectrum disorders during relocation and separation. *Journal of Autism and Developmental Disorders*, 45(7), 2019-2034.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11, 227-268.

Durkin, K. (2010). Video games and young people with developmental disorders. *Review of General Psychology*, 14(2), 122-140.

Durkin, K., Boyle, J., Hunter, S., & Conti-Ransden, G. (2013). Video games for children and adolescents with special educational needs. *Zeitschrift für Psychologie*, 221, 79-89.

Dye, M. W. G., Green, C. S., & Bavelier, D. (2009). The development of attention skills in action video game players. *Neuropsychologia*, 47, 1780-1789.

Electronic Software Association. (2016). Essential facts about the computer and video game industry. Retrieved from <http://essentialfacts.theesa.com/Essential-Facts-2016.pdf>

Ferrar, K. E., Olds, T. S., & Walters, J. L. (2012). All the stereotypes confirmed: Differences in how Australian boys and girls use their time. *Health Education & Behavior*, 39, 589-595.

Finke, E., Drager, K., & Serpentine, E. C. (2015). "It's not humanly possible to do everything": Perspectives on intervention decision-making processes of parents of children with autism spectrum disorders. *SIG 1 Perspectives on Language Learning and Education*, 22(1), 13-21.

Finke, E. H., Drager, K. D., & Ash, S. (2010). Pediatricians' perspectives on identification and diagnosis of autism spectrum disorders. *Journal of Early Childhood Research*, 8(3), 254-268.

Finke, E. H., Hickerson, B., & McLaughlin, E. (2015). Parental intention to support video game play by children with autism spectrum disorder: An application of the theory of planned behavior. *Language, Speech, and Hearing Services in Schools*, 46, 154-165.

Finke, E. H., Wilkinson, K. M., & Hickerson, B. D. (2017). Social referencing gaze behavior during a video game task: Eye tracking evidence from children with and without ASD. *Journal of Autism and Developmental Disorders*, 47(2), 415-423.

Gee, J. P. (2009). Video games, learning, and "content." In C. T. Miller (Ed.), *Games: Purpose and potential in education* (pp. 43-53). New York: Springer Publishing.

Grandin, T., & Duffy, K. (2008). *Developing talents: Careers for individuals with Asperger's syndrome and high-functioning autism*. Shawnee Mission, KS: Autism Asperger Publishing Co.

Green, C. S., & Bavelier, D. (2003). Action video game modifies visual selective attention. *Nature*, 423, 534-538.

Green, C. S., & Bavelier, D. (2006). Effect of action video games on the spatial distribution of visuospatial attention. *Journal of Experimental Psychology: Human Perception and Performance*, 32, 1465-1478.

Gould, J., Moore, D., McGuire, F., & Stebbins, R. (2008). Development of the Serious Leisure Inventory and Measure. *Journal of Leisure Research*, 40, 47-68.

Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review*, 26, 55-88.

Hughes, C. E. (2017). Focusing on strengths: Twice-exceptional students. In W. W. Murawski & K. L. Scott (Eds.), *What really works with exceptional learners* (pp. 302-319). Thousand Oaks, CA: Corwin.

Jarrold, C., Boucher, J., & Smith, P. (1993). Symbolic play in autism: A review. *Journal of Autism and Developmental Disorders*, 23(2), 281-307.

Koegel, L. K. (2000). Interventions to facilitate communication in autism. *Journal of Autism and Developmental Disorders*, 30(5), 383-391.

Kuo, M. H., Orsmond, G. I., Coster, W. J., & Cohn, E. S. (2013). Media use among adolescents with autism spectrum disorder. *Autism: The International Journal of Research and Practice*, 18(8), 914-923.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33, 159-174.

Law, M., & MacDermid, J. (2008). *Evidence-based rehabilitation: A guide to practice* (2nd ed.). Thorofar, NJ: SLACK Incorporated.

Lenz, B. (2001). The transition from adolescence to young adulthood: A theoretical perspective. *The Journal of School Nursing*, 17(6), 300-306.

Markey, P. M., & Markey, C. N. (2010). Vulnerability to violent video games: A review and integration of personality research. *Review of General Psychology*, 14(2), 82-91.

Mathur, R., & Berndt, T. J. (2006). Relations of friends' activities to friendship quality. *Journal of Early Adolescence*, 26, 365-388.

Mazurek, M. O., & Engelhardt, C. R. (2013). Video game use in boys with autism spectrum disorder, ADHD, or typical development. *Pediatrics*, 132, 260-266.

Mazurek, M. O., Engelhardt, C. R., & Clark, K. E. (2015). Video games from the perspective of adults with autism spectrum disorder. *Computers in Human Behavior*, 51, 122-130.

Mazurek, M. O., & Wenstrup, C. (2013). Television, video game and social media use among children with ASD and typically developing siblings. *Journal of Autism and Developmental Disorders*, 43(6), 1258-1271.

McNaughton, D., Light, J., & Groszyk, L. (2001). 'Don't give up': Employment experiences of individuals with amyotrophic lateral sclerosis who use augmentative and alternative communication. *Augmentative and Alternative Communication*, 17, 179-189.

Meline, T. (2006). *Research in communication sciences and disorders: Methods, applications, evaluation*. Upper Saddle River, NJ: Prentice Hall.

Morse, J. M., & Field, P. A. (1995). *Qualitative research methods for health professionals* (2nd ed.). Thousand Oaks, CA: SAGE.

Olson, C. K. (2010). Children's motivations for video game play in the context of normal development. *Review of General Psychology*, 14(2), 180-187.

Olson, C. K., Kutner, L. A., Warner, D. E., Almerigi, J. B., Baer, L., Nicholi, A. M., & Beresin, E. V. (2007). Factors correlated with violent video game use by adolescent boys and girls. *Journal of Adolescent Health*, 41(1), 77-83.

Pellicano, E., Maybery, M., Durkin, K., & Maley, A. (2006). Multiple cognitive capabilities/deficits in children with an autism spectrum disorder: "Weak" central coherence and its relationship to theory of mind and executive control. *Development and Psychopathology*, 18(1), 77-98.

Petrina, N., Carter, M., & Stephenson, J. (2014). The nature of friendship in children with autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders*, 8(2), 111-126.

Raymore, L. A., Barber, B. L., & Eccles, J. S. (2001). Leaving home, attending college, partnership and parenthood: The role of life transition events in leisure pattern stability from adolescence to young adulthood. *Journal of Youth and Adolescence*, 30, 197-223.

Rosenthal, M., Wallace, G. L., Lawson, R., Wills, M. C., Dixon, E., Yerys, B. E., & Kenworthy, L. (2013). Impairments in real-world executive function increase from childhood to adolescence in autism spectrum disorders. *Neuropsychology*, 27(1), 13-18.

Shah, A., & Frith, U. (1993). Why do autistic individuals show superior performance on the block design task? *Journal of Child Psychology and Psychiatry*, 34(8), 1351-1364.

Sherry, J. L. (2004). Flow and media enjoyment. *Communication Theory*, 14(4), 328-347.

Squire, K. (2005). Changing the game: What happens when videogames enter the classroom? *Innovate: Journal of Online Education*, 1, 1-20.

Stebbins, R. A. (1982). Serious leisure a conceptual statement. *Sociological Perspectives*, 25(2), 251-272.

Steinkuehler, C., & Squire, K. (2013). Video games and learning. In K. Sawyer (Ed.), *Cambridge handbook of the learning sciences* (2nd ed, pp. 387-396). New York: Cambridge University Press.

Tuggle, F. J., Kerpelman, J., & Pittman, J. (2016). Young adolescents' shared leisure activities with close friends and dating partners: Associations with supportive communication and relationship satisfaction. *Journal of Leisure Research*, 48, 374-394.

Vaughn, S. R., Schumm, J. S., & Sinagub, J. M. (1996). *Focus group interviews in education & psychology*. Thousand Oaks, CA: SAGE Publications, Ltd.

Vitaro, F., Boivin, M., & Bukowski, W. M. (2009). The role of friendship in child and adolescents psycho-social development. In K. H. Rubin, W. M. Bukowshi, & B. Larsen (Eds.), *Handbook of peer interactions, relationships and groups* (pp. 301-321). New York: Guildford Press.

Waldrip, A. M., Malcolm, K. T., & Jensen-Campbell, L. A. (2008). With a little help from your friends: The importance of highquality friendships on early adolescent adjustment. *Social Development*, 17, 832-852.

Winter-Messiers, M. A. (2007). From tarantulas to toilet brushes: Understanding the special interest areas of children and youth with Asperger syndrome. *Remedial and Special Education*, 28(3), 140-152.