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CONVERSATIONAL ANALYSIS OF NEUROTYPICALLY DEVELOPING ADULTS
DURING COOPERATIVE AND COMPETITIVE VIDEO GAME PLAY

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ABSTRACT

The purpose of this study is to determine the communicative intent and structure during cooperative and competitive video game play of neurotypical peers. A characteristic of individuals with autism spectrum disorder (ASD) is social impairment (American Psychiatric Association, 2013). The purpose of this study is to use conversation analysis to understand how typically developing friend dyads communicate and interact while playing videogames. Data from this project can be used to develop strategies to help those with ASD more successfully participate in mutually motivating activities with their peers, such as playing video games. The study observed six dyads, three competitive and three cooperative groups. The results of the study showed communicative intent and communicative structure varied among the cooperative and competitive video game play groups. Speech language pathologists can use the results of the patterns identified create strategies to help those with ASD take part in conversations during video game play.

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Chapter 1

Introduction

In the United States, it is estimated that “more than 3.5 million Americans live with an autism spectrum disorder (ASD)” (Buescher et al., 2014). Some characteristics associated with ASD include social impairments, communication delays and repetitive behaviors (American Psychiatric Association, 2013). Those living with ASD often have trouble communicating to form relationships with peers. There currently is no known cause or cure for ASD, however, there are many techniques and strategies that speech language pathologists (SLP) use to help treat ASD. The goal of the current research project is to provide more evidence to create better strategies for providing intervention to help people with ASD converse with their peers and develop significant social relationships.

Friendships and relationships are an important part of human development. Friendship quality is particularly important for cognitive and behavioral development. High quality friendships also help increase such as self-esteem and prosocial behaviors (Berndt, 2002). In addition, it is important to examine how friendship quality can influence friendship longevity.

Literature Review

Friendships in Typical Development

During each stage of development, friendship and communication changes in typically

developing friendships. While friendships are different for each person, Rawlins (2008) states, “friendships are highly patterned culturally and contextually” (para. 3). Through this pattern, we can look at similarities that occur within each stage of life regarding the formation of friendships. In the early to middle elementary school years, friendships develop between children who are the same demographic traits and involved in common activities (Smollar & Youniss, 1982). During the later elementary school years, children form friendships based on similar experiences and goals. During adolescence, friendships become more personal and intimate. Friendships at this stage of development help individuals form a sense of identity and provide support to one another. In adulthood, friendships develop based upon career paths, intimate relationships, and extracurricular activities (Rawlins, 2008).

Communication plays a large role in friendship and social development. Through communication, people are able to disclose personal information about themselves. This information is useful in helping to form relationships. Communication is used to share ideas and perspectives in order to socialize with others. Research has shown that the content of conversation amongst friends changes as the friendship level changes and depends on the age of the people in the friendship. Some content discussed amongst friends includes emotional support and personal issues. Depending on the quality of the relationship between two people, talk relates more to their experiences or careers. Additionally, communication amongst friends may depend on their shared experiences. Communication is important because it not only helps build friendships, but relationships in general and helps people relate with one another (Hartrup & Stevens, 1997).

According to Rawlins (2008), five characteristics should be taken into account when forming new friendships. Friendships should be voluntary. Although, providing social

opportunities can help, individuals will ultimately choose who their friendship partners are. Additionally, individuals form friendships through acknowledging similar interests and qualities. Another characteristic of a friendship is non-intimate affection for one another. The last two characteristics include equality within the friendship and reciprocity of the relationship. These characteristics play an important role in the formation and continuation of friendships (Rawlins, 2008). Clearly, there has been extensive investigations of the formation and maintenance of typically developing friendships, however, there is far less known about the friendships of people with ASD.

Autism Spectrum Disorder Friendships and Friendship Outcomes

According to Tipton and colleagues social impairment, a primary characteristic associated with an ASD diagnosis, influences friendship quality. Studies show that those with an ASD experienced lower levels of warmth and closeness in their friendship relationships. The research also illustrates that those with intellectual disability had lower levels of reciprocity in a friendship compared to those who were typically developing. One reason for the lack of reciprocity in friendships of individuals with intellectual and developmental disabilities may be a lack of similarities in interests or hobbies (Tipton, Christensen, & Blacher, 2013). When helping the individual with ASD make friends it is important to make sure the two individuals have characteristics in common so that the individuals are able to relate to one another.

In a review of previous studies, Petrina, Carter, and Stephenson (2014) synthesized the published research with respect to friendship characteristics, definitions of friendship, friendship quality, reciprocity of friendship, and friendship satisfaction for individuals on the autism

spectrum. Overall, it was reported children with ASD have fewer friends than neurotypically developing peers. However, many studies showed that 80% of people with ASD have at least one friend. In addition, people with ASD tended to have friendships that were shorter than those without ASD. Reports indicated that those with ASD often had more friends with disabilities compared to those without ASD. When comparing the understanding and definition of friendship neurotypically developing children and adolescents had a better understanding of the friendship definition compared to those with ASD, including many different aspects of friendship. Interestingly, most studies found that those with and without ASD reported similar information when it came to friendship quality. Lastly, those with ASD often reported lower levels of reciprocity of friendship compared to typically developing peers, which can be expected as that is one of the main friendship characteristics people with ASD struggle with the most (Petrina et. al, 2014). These findings about friendship characteristics within people with ASD ultimately contrast the research information found in typically developing children and adolescents.

In order to promote friendships for individuals with ASD, it has been suggested that two people must be of equal status, engage in a motivating activity together, and interact with each other regularly (Finke, 2016). People with ASD want to form relationships; however, they have difficulty understanding relationships, which influence the friendship quality and reciprocity. This may explain why children with ASD report to have a lower number of friends compared to other children with disabilities (Rowley et al., 2012; Solish, Perry, & Minnes, 2010). Due to individuals with ASD having a difficult time understanding relationships, the friendship quality and maintenance is poor. These friendships do not usually last outside in the individual's natural environment, which is the goal of these friendship strategies.

ASD Interventions

Currently there are many interventions to help people with ASD form social relationships with others. Social skills training programs have been an intervention approach primarily used to help people with ASD practice strategies that will help them form relationships with their peers. Additionally, eight social skills intervention strategies commonly used to help in therapy sessions with people with ASD. These interventions include cognitive behavioral intervention, modeling, naturalistic intervention, pivotal response training, self-management, social narratives, technology-aided instruction, and video modeling (Otero, Schatz, Merrill, & Bellini, 2015). These methods are useful in helping to teach social skills that may prompt social interactions with other people, such as eye contact, initiations, complimenting others and use of gestures and facial features. However, these interventions do not help to form meaningful friendships among peers. Finke (2016) suggested the reason these interventions may not translate to formation of meaningful friendships might be that researchers control many aspects of the social skills interventions. Therefore, people with ASD have a difficult time generalizing the use of the skills and or applying them in ways that assist them in forming and maintaining authentic friendships. These interventions are also not always taking place in a person's natural environment and may only occur within the speech therapy session, which does not lead to generalization of these skills in the person's natural environment (Finke, 2016). Suggestions as an intervention technique to promote authentic friendships include highly motivating activities that occur in natural environments.

Newly introduced motivating activities, such as video game play, may help promote new friendships between people with and without ASD. A reason this intervention is of interest is because it provides multiple opportunities for conversation and interaction. Video game play is

also an activity in which anyone with any skill level can play. Through video game play two people can work together to solve a problem to complete the game (Finke, 2016). It is important to begin to understand the relationships formed through playing video games. This intervention strategy requires more research as it can provide insight as to what is required during a social interaction of playing a mutual enjoyable game.

Media Use with People with ASD

A study done by Kuo et al. (2011), examined the friendships of individual with ASD, as well as friendship characteristics. The study, examined the types of activities people with ASD engage in with their friends. When looking at the characteristics of the adolescents top three friends of adolescents with ASD, most were the same gender as the individual. Fifty-six percent of the adolescent with ASD's friends also had a disability varying in severity. The study found that the most common activity that most adolescents with an ASD participated in with their friends was playing video games. It is important to note the gender differences among the research, as it found that males were more likely to play video games than females with their friends. The researchers also looked at the friendship quality regarding the adolescents' activities. It was that, "playing video games was the only activity significantly associated with adolescents' perceptions of friendship qualities. Adolescents with an ASD who played video games with friends on any given day reported more overall positive friendship qualities and greater companionship with their best friend than those who did not play video games with friends" (Kuo, Orsmond, Cohn, & Coster, 2011, p. 493). This research is important to the current study as it shows video game play can help adolescents with ASD form positive

friendships and is an activity shared amongst two people. The research shows that connections are stronger when individuals play video games together.

Within the last decade media has influenced the lives of many Americans. Media has not only impacted neurotypically developing people's lives, but also those with ASD. Kuo et al. (2013) study particularly looked at the amount of time and type of media people with ASD used. The research showed people with ASD spent on average about two hours a day watching television and about five hours a day on the computer. Within the computer category, video game play was included. Interestingly, it was found that of the five hours a day of computer use, two hours of that time was spent either looking up video games or playing video games (Kuo, Orsmond, Coster & Cohn, 2013). This research is important as it shows that people with ASD are interested in the video game play activity, which means that video game play is an activity that can be used as a high interest intervention.

Additionally, research has looked at the specific reasons why people with ASD are interested in playing video games and the types of video games that interest them. In a study done by Mazurek and colleagues (2015), there were eleven themes presented when people with ASD were asked why do they play video games. These themes included: stress relief, fantasy/immersion, filling time, social aspect, compulsion, enjoyment, achievement/ challenge, autonomy/ creativity, story, graphics, and mental stimulation. The most relevant theme related to the current study was the social aspect. Within the study, one of the women stated she plays video games with others because those are the only friends she has. Others stated that video games were the only shared activity that they could relate to and play with another person. These are important themes because it shows that video games are an activity that can unite those with and without ASD.

The study also looked at the most popular video game genre amongst people with ASD. The most popular video games included role-playing/ action-role-playing, action-adventure, and platform/ party. The least popular video games included Sandbox games such as Minecraft, sports, and fighting (Mazurek et al., 2015). These results are particularly interesting as the most popular games are video games most often played with other people. Once again, this shows that video games are an important social aspect for people with ASD.

Research Aims

General research acknowledges people with ASD have a desire to make friendships; however, little research has evaluated techniques of how people with ASD can create and maintain friendships. The current research intends to look at how people with ASD can make friends. Through this conversation study, the hope is to look at what neurotypically developing people discuss during video game play. We hope to look at what the conversation is like and more importantly, this research looks at how friends interact with one another while playing video games.

The friendship forming techniques contribute to the design of this study. Video games are the motivating activity. Video games are conducive with any age group and socioeconomic status, making it an equal opportunity for both partners. Lastly, video games can be a replicated activity. Analyzing neurotypically developing people's conversations is important, as we are examining the topic and the length of conversations. The goal of the conversation analysis is to provide strategies for those with ASD to take part in conversation while playing video games. The current research intends to look at elements needed in order to have conversations; this

examination occurs through neurotypical video game play conversation.

In addition to looking at the conversations between neurotypical friendships during video game play, the study aims to look at how different video game play effects conversation. The study is important in determining if competitive versus cooperative video games provoke different conversations. The research questions this study aim to look at is 1) What type of conversation do neurotypical adults partake in during video game play? (communicative intent) 2) What is the structure and participation of neurotypical adults in conversation during video game play? (topic changes) 3) Does the type of video game change the type of conversation, i.e. cooperative vs. competitive?

Chapter 2

Method

Study Design

The current study used an observational research design, which used a coding system to determine different conversational units within the observed game play. The experiment's design included a non-structured video and audio observation of each video game playing dyad. The video game play observation session recorded for one hour. Conversation analysis determined the conversational topics and structure involved in video game play. The data elements were the conversational topics. This design chosen for the study as it provided an accurate description of video game play experiences and conversations.

Participants and Recruitment

The data in this study included young adults ages 18-30 who were neurotypically developing. There were six dyads examined, totaling twelve participants. Five of the dyads included two males, while one dyad was comprised of two females. Participant recruitment occurred in various ways including flyer distribution, announcements in classes, and through personal contacts. Each participant was required to complete a pre-screening to test his or her neurotypical language abilities. In addition, each participant provided informed consent approved by the Institutional Review Board (IRB).

Materials

Before the dyads participated in video game play, language screenings occurred. The test used was the *Peabody Picture Vocabulary Test, 4th Edition (PPVT4)*. The test was to determine the level of receptive vocabulary each participant acquired compared to his or her age range. In addition, each participant completed an informed consent and demographic form, which provided more information about each person's video game experiences. The video game systems for each dyad included the option of playing included Xbox One, Xbox 360, Play Station 3, or Play Station 4. The participants had the option of bringing their own game to play or they could play a game provided. This was to ensure the dyad was familiar with the chosen video game. The video game play conversation was audio and video recorded using a Panasonic HC-V770 camera and later watched by the research team in order to transcribe the conversations. The researchers uploaded the recordings to an iMac to transcribe and record the data into a word document.

Procedures

Participants each scheduled a one-hour video game session in The Autism Spectrum Disorders Laboratory at the Pennsylvania State University. Before the video game play, participants received an explanation of the purpose and procedures of the study and they completed an informed written consent form. Each participant received a code to protect the dyad's identity. The participants also completed a demographic form before the video game play, including age, race, ethnicity and grade level. The form included information about the participant's video game play habits. These included which type of video game consoles each

participant has played, how often they played video games, if they preferred to play video games alone or in a group and if they preferred to play video games in-person or online. All of the participant demographic information detail is in Appendix A. Each participant performed a language screening, the *Peabody Picture Vocabulary Test, 4th Edition* to determine his or her language comprehension level.

Each dyad then played video games for one hour, while being video recorded. During video game play, the participants were not given any formal instructions and were observed playing video games in a natural environment, in order to observe their normal conversation. After each recorded observation, members of the research team transcribed the entire video into a word document. Each transcription received conversation unit code for data analysis.

Data Analysis

Conversational analysis was used to determine themes of communication that took place during video game play. In order to analyze the conversations from each dyad's video game play experience, the research team members transcribed each video recording into a word document. The transcription was broken into conversational "turns." The conversational "turns" data analysis occurred during the coding scheme. For confidentiality purposes, a research team member de-identified the transcription, by assigning people and places pseudonyms. Once one research team member transcribed each dyad's video, a different team member transcribed 20% of the video in order to check for reliability. Coding of the transcriptions into conversation units allowed further analysis to determine the conversation topics (Appendix B). The conversation

units helped determine the themes each dyad talked about during the conversation. The codes developed by the research team determined the main topics of conversations. Once the initial data coding occurred, another research team member coded 20% of the transcription to ensure the reliability of each code. Both members of research team then met to discuss any disagreements and determine the inter-rater reliability. A summary of the coded data determined topics of conversation for results of the study.

Reliability

To calculate the reliability of the data, two different research team members transcribed and coded 20% of the data. The reliability for both had to be at an 80% agreement and met in order to resolve any disagreements. Inter-rater reliability calculations prepared by dividing total number of agreements by the total number of conversational turns. The transcription data averaged 87% reliability and the coded data averaged 82% reliability, which both reached the recommended reliability of at least 80% agreement.

Chapter 3

Results

The following chapter presents the findings to answer the following questions: 1) What type of conversation do neurotypical adults partake in during video game play? (communicative intent); 2) What is the structure and participation of neurotypical adults in conversation during video game play? (topic changes); 3) Does the type of video game change the type of conversation, i.e. cooperative vs. competitive? This third question will be addressed through, comparison of the data from research questions 1 and 2.

Communicative Intent

Data were coded for the occurrence of five main communicative intents addressed throughout the conversational game play session; these included (1) wants/needs (WN), (2) social closeness (SC), (3) information transfer (IT), (4) social etiquette (SE), and (5) commenting on video game (CM).

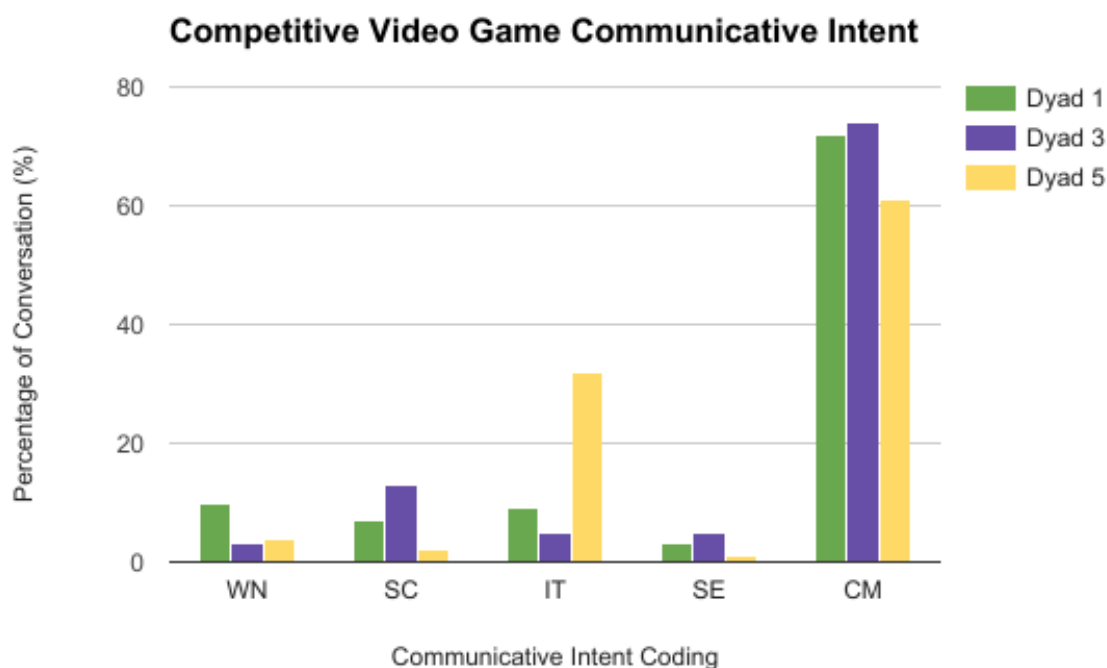
Competitive Video Game Play

As seen in Table 1, during competitive video game play, the data indicated the overwhelming communicative intent across all three dyads, was commenting on the video game. Additionally, in competitive game play less than 10% of the conversation pertained to expressing wants/needs, social closeness, and social etiquette across all three dyads. The dyad, Dyad 5, was

an exception and communicated 32% of the time for the purpose of information transfer while playing a competitive video game. The other two dyads, Dyad 1 and Dyad 3 had less than 10% of the conversation dedicated to the function of information transfer.

Commenting on game play during competitive game play includes discussing specific ideas related to the video game. An example included comments such as, “I thought the guy was gonna knock it out of the other guy’s hands” and “I’m gonna play as the Blues next game, you can pick whatever you know to be the best team.” The majority of the comments between the competitive dyads related to specific video game details such as team players or team names. Expressing wants/ needs during video game play included comments like, “What is it to select QB again?” These comments were less frequent compared to the dyads that played cooperative video games. It did not appear the competitors were generally interested in helping each other. An example of social closeness throughout the video game conversations includes, “It’s alright bud,” and an example of social etiquette would be answering a question or statement with “yes” or “okay.” While turns for the function of information transfer varied, an example included, “I’m just gonna do something real quick. I’m gonna um, make Holiday a starter.” Information transfer varied depending on whether the dyad was on topic or off topic about the video game.

Figure 1. Competitive Video Game Communicative Intent



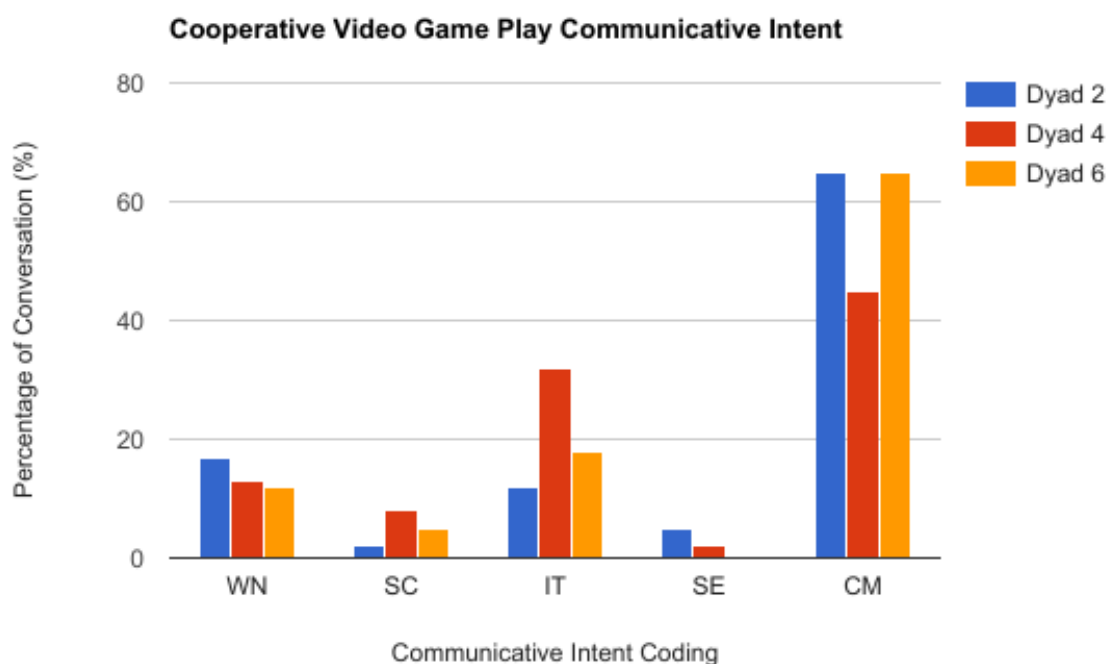
Cooperative Video Game Play

Table 2, displays the data collected during cooperative video game play. The data from these conversations indicate the most common communicative intent was commenting on the video game, which occurred in 65% of the communicative turns coded. Information transfer was the next most common communicative intent ranging from 12-32% depending on the dyad. Compared to competitive game play, dyads playing cooperative video games communicated for the function of meeting their wants/ needs more frequently with this intent representing of 10% of the conversation. Communication for the purpose of social closeness also was more common in cooperative played compared to competitive play, but was still low, occurring in communicative acts between 2-8% of the time. Social etiquette continued to be a low

communicative intent in conversations during cooperative play, with less than 10% of the conversation.

During cooperative video game play, commenting on the video game was very similar to the commenting on the video game during competitive game play conversations. When discussing specific details about the game, a dyad's conversation looked like, B: "There's so many pieces everywhere." A: "Yeah I know, what are they for?" The next two most common communicative intents expressed were information transfer and expressing wants/ needs, which included the dyad pairs asking for, and obtaining help from each other throughout the game. Helping each other was more common in cooperative video game play than competitive. Some examples of expressing wants/ needs and information transfer of cooperative video game included, A: "How do you do rockets?" B: "B, I believe, maybe not, maybe that one is the left trigger." Social closeness was evident throughout cooperative video game play conversations and showed the dyad partners supporting to each other throughout the video game play interaction. An example of social closeness included, A: "I like your idea way better," B: "Yeah, it's a good one right?" Social etiquette was consistent throughout both cooperative and competitive play with similar comments of answering a question with "yes" or "okay." There were not many times throughout both types of game play interactions where social etiquette included politeness such as, "Thank you" or "You're welcome."

Figure 2. Cooperative Video Game Play Communicative Intent



Communicative Structure

There were eight main communicative structures coded throughout the conversational game play interactions, these included (1) on topic initiation (1A), (2) off topic initiation (1B), (3) obligatory on topic response (2A+), (4) non-obligatory on topic response (2A-), (5) obligatory off topic response (2B+), (6) non-obligatory off topic response (2B-), (7) on topic interruption (3A), and (8) off topic interruption (3B).

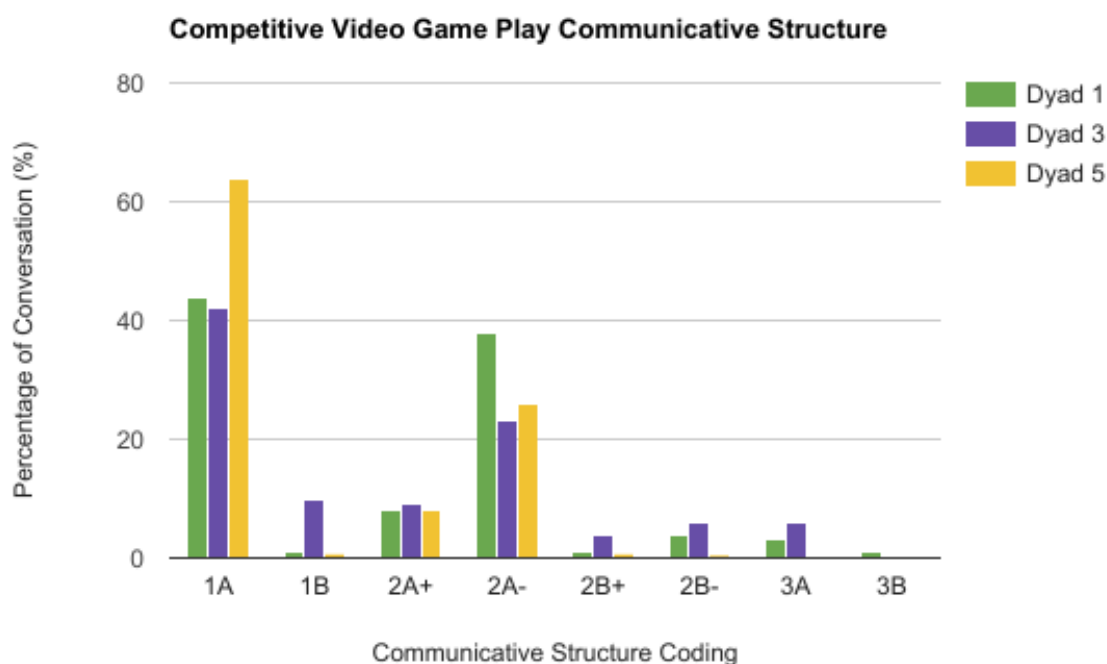
Competitive Video Game Play

The data presented in Table 3, illustrate the most common communicative structure

across all three dyads throughout competitive video game play were on topic initiations (1A) with data ranging from 42-64%, followed by non-obligatory on topic responses (2A-) at data ranging from 23-38% of the conversation. The data pertaining to obligatory on topic responses (2A+) was consistent throughout the dyads and occurred for about 8-9% of the turns in the conversations. The data was somewhat inconsistent among the dyads for the following structures including off topic initiations (1B), obligatory off topic responses (2B+), and non-obligatory off topic responses (2B-), as the dyad, Dyad 3, seemed to engage in more off topic conversation compared to the other two dyads. On topic interruptions (3A) and off topic interruptions (3B) were the least common conversational structures used occurring during 0-6% of the conversations.

An on-topic initiation received a code any time introduction of new ideas occurred in the conversation. Some examples included “How many shots do you have?” or “Are we doing one and two?” Non-obligatory responses coded were for comments that did not directly answer a question, but were not entirely new topics either. These types of responses throughout competitive video game play conversations included, “I think I can do it again, he’s still here,” and “I didn’t know he was that new to the league.” As discussed above, Dyad 3 engaged in more off topic conversations such as, asking about what their partner’s plans were for the holiday, stating “What are you guys doing for Easter? Anything with your brothers?” However, the other two dyads did not engage in much off topic conversation. On topic and off topic interruptions were also not common, but included interruptions of the conversation with words like, “Goal,” or “Oh wow, hey!”

Figure 3. Competitive Video Game Play Communicative Structure



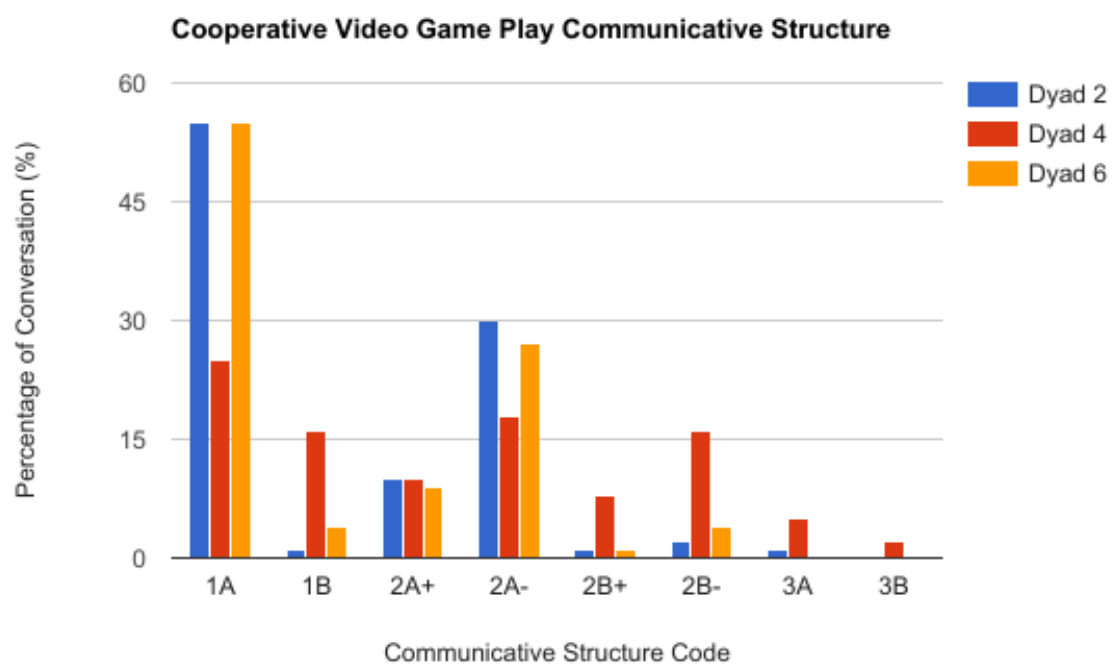
Cooperative Video Game Play

When comparing the communicative structures used during cooperative video game play with those used during competitive video game play, on topic initiations (1A) and non-obligatory on topic responses (2A-) were still the top two types of communicative acts throughout cooperative video game conversations. However, both of these types of communicative acts occurred less frequently during competitive video game play interactions. As seen in Table 4, on topic initiations (1A) throughout cooperative video game play ranged from 25-55% in conversation, while non-obligatory on topic responses (2A-) ranged from 18-30%. Other types of communicative acts were similar across the game play interactions. Similar to competitive video game play obligatory on topic responses (2A+) ranged from 9-10%. The data consistent

with competitive game play conversation, fluctuates in cooperative video game play for off topic initiations (1B), obligatory off topic responses (2B+), and non-obligatory off topic responses (2B-). The dyad, Dyad 4, seem to have more off-topic conversations throughout the video game play interaction, which increased their percentages compared to the other two dyads. Also, similar to competitive game play, on topic interruptions (3A) and off topic interruptions (3B), remained the two least common conversational structures throughout cooperative video game play conversation, with data ranging from 0-5%.

Compared to competitive game play, conversational structures throughout cooperative game play looked very similar throughout the conversations. As mentioned on topic initiations are still the most common theme throughout cooperative video game conversation and included starting new conversation topics such as, “We need to get this water out,” and “Is it like a jump puzzle?” Non-obligatory on topic responses included comments like, “Let’s see where we’re supposed to go,” and “Those things are ten times stronger without baits.” While not directly answering a question, these comments were mostly on topic during the game. Similar to competitive game play conversations, one dyad, Dyad 4 engaged in more off topic conversation. This included conversations about discussing tests and extracurricular activities. A sample of the conversation looked like, B: “Today has been so bad for me that I thought today was not Monday and already Tuesday,” A: “I wish!” B: “No I don’t because I have an exam on Monday that I’m not prepared for at all.” A: “I had an exam today, tomorrow, and Wednesday.” On topic and off topic interruptions throughout the cooperative video game conversation were low, but included comments such as, “All this crazy free running. Woah” and “Oh there you go.” These comments were often times encouragement to their partner or comments about what just happened in the video game on the screen.

Figure 4. Cooperative Video Game Play Communicative Structure



Chapter 4

Discussion

The purpose of the current study was to determine the types and the structure of conversation during video game play between two partners. The study determined the communicative intents and topics of conversation between friends during video game play interactions. This study compared adults' conversation during cooperative vs. competitive video game play. The following section will discuss the results and implications of the study, the implications for clinical practice, the limitations to the study and recommendations for future research.

Results of the Current Study

Previous research has shown that communication plays a large role in helping peers relate to each other in order to form relationships (Hartrup & Stevens, 1997). The current research project helped gather evidence to support how communication affects friendships while involved in a motivating activity. The study helped to identify neurotypical communication styles that will be used in the future to create strategies to help those with ASD communicate with their peers.

The goal of understanding these communication strategies is to help those with ASD engage in conversation during social activities. Current research has shown that many social intervention strategies take place for individuals who have social impairments. However, these interventions do not take place in their natural environment and do not help individuals maintain their friendships (Finke, 2016). Additionally, friendships between individuals tend to lack

reciprocity due to their peers not having similar interests or hobbies (Tipton et al., 2013). The current study is important because it shows how individuals communicate during an activity that both peers are interested in. As discussed by Kuo et al. (2013) video games are an activity that individuals with ASD take part in for at least two hours a day. Through these research results the hope is to continue to have individual's with ASD take part in an activity they enjoy while creating positive friendships.

Video games is a newly introduced intervention context; however, there is not that much current research as to what takes place during these video game play interactions. Research has shown that individuals with ASD have better friendship qualities and relationships when they are playing video games (Kuo et al., 2011). Since video games are helpful for those with ASD it is important to determine how the individuals can use this activity to continue to build relationships. By understanding the structure and intent of the communication during the video game play, individuals with ASD can practice having positive interactions while doing an activity they enjoy.

The importance of video game play is that it is an activity that individuals can work together to solve a common goal or finish the game (Finke, 2016). The current study's results showed how individuals who played cooperative games worked together more often to complete a task compared to the competitive dyads. This was shown as the results for cooperative video game play communication intent included a higher percentage of information transfer and expression of wants and needs compared to the competitive game play. This interaction helps to provide the individuals with high opportunities for social interactions. Through understanding how neurotypically developing individuals interact while playing video games, the same patterns of structure and intent can be used when an individual with ASD is interacting while playing

video games.

The differences between competitive and cooperative play have been discussed in the results section. Overall, the study found that individuals in both cooperative and competitive game play had conversations mostly pertaining to the context of the video game, which was overall the main communicative intent. However, it was found that those who took part in cooperative video game play were more likely to have other conversations pertaining to expressing want/ needs and information transfer. When examining the communicative structure the results were different than when examining the results of the communicative intent. In relation to the communicative structure both the cooperative and competitive video game play dyads had similar structural patterns when conversing. These results help to create strategies for individuals to interact during cooperative video game play, as many individuals with ASD play for the social interaction and prefer cooperative video games compared to competitive video games (Mazurek et al., 2015). The current studies are important because they show there are more topics of conversation during cooperative play compared to competitive play. Due to the diverse communicative intent, individuals who play cooperative video games should learn strategies that would involve them to engage in conversations not pertaining to the video game. By comparing both the competitive and cooperative video game conversations, different strategies can be taught to the individual depending on the type of game they are participating in.

Clinical Implications

The results of the current study have a few implications for the field of speech-language pathology. As discussed in the literature review there are many different types of interventions

for people with ASD. These interventions traditionally focused on individuals expanding their social skills in order to promote friendships. However, research has shown these techniques have not always been successful (Petrina et al, 2014).

Recent studies have shown video game play is an activity that can be a motivational intervention for those with ASD (Finke, 2016). This research is especially important because it provides speech language pathologists (SLPs) with the information of what is involved in neurotypical conversational video game play. Through the neurotypical video game conversational data, strategies to help people with ASD have increased success in conversations with peers during this preferred activity can be identified. Video games are not currently a widespread intervention context for building social relationships. Therefore, it is important for SLPs to get a better understanding of how interactions occur during video game play so as to better design interventions that take place during video game play interactions.

Through conversational analysis, the current study showed a difference in conversation patterns of established friends playing competitive and cooperative video games. These results can help SLPs determine the type of games that would be most appropriate for their clients with ASD. Additionally, with the knowledge of the conversation topics, the SLPs can help the person with ASD come up with conversation topics and strategies before they play video games with a new or emerging friend. By becoming more comfortable with the topics, the client with ASD will be able to use these strategies to participate in the conversation.

Through the current research SLPs can teach the same communication skills and patterns to individuals with ASD. These strategies can help the partner with ASD keep pace in the conversation with their typically developing partner. By identifying these patterns, the SLP can promote positive communication between partners.

Limitations

There are several limitations involved in the current study. There were only six dyads (twelve people) as participants. Due to the small sample size, the conversational results may not be generalizable to an entire population. More dyads are necessary to determine the accuracy of the structure and topics of conversation during both competitive and cooperative video game play. Additionally, it is important to note that only three of each type of video game were analyzed. Therefore, the differences are not generalized to all of the games within the category.

Another limitation of the current study is that all of the participants in the study were neurotypically developing and not diagnosed with an ASD. Therefore, these conversations do not provide information about what those with ASD may discuss during video game play. While these results can assist in the development of strategies by SLPs, they do not represent the conversation of the ASD population.

The last limitation taken account is the fact that the video game play took place in a lab environment instead of the participant's natural environment. While the lab is set up to be as natural and least restricting as possible, it cannot guarantee that the environment did not affect the participant's conversations. To eliminate this bias, the data collected at the dyad's natural game playing environment would get the more accurate results.

Future Research

Future research to strengthen the findings within the current study is recommended, as more data to determine the accuracy of the results of the current study regarding the communicative intent and communicative structure during video game play would be beneficial.

In addition, more research should include how the different types of video games affect the conversation. Through examining how different video games influence the conversations will allow for more clinical strategy development. This research is important for SLPs as it is an upcoming intervention strategy that helps those with ASD learn strategies communicate within their natural environment.

Additional research includes analysis of all age groups, including younger children. Conversational analysis across all age groups can acknowledge the communication differences. This will help SLPs individualize their goals and plans according to specific age groups. Additionally, it is important to do further research including those with an ASD diagnosis. Analyzing how those with ASD communicate during video game play data will show the developmental differences between communicative structure and topics. This further analysis will determine how those with ASD communicate differently than those without ASD.

Summary

According to the DSM-V, children and adults with ASD often display social impairments, which affect how those with ASD form relationships with their peers (American Psychological Association, 2013). In order to promote friendships involving people with ASD, SLPs utilize many social interventions. However, maintenance of many of these intervention strategies is challenging because they are not practiced in their natural environments (Finke, 2016). The current study looks to discover how a new intervention strategy, playing video games, are important in helping individuals with ASD form relationships with peers. The results from the current study show that communicative structure and intent vary depending on the type

of game that is played. These results can help SLPs design interventions that use video games as a context for intervention to promote social relationships and friendships for individuals with ASD.

Appendix A

Participant's Demographics

Participant Code	Age	Gender	Race	Ethnicity	Grade Level	Type of Video games Played	How often do play video games?	Would you rather play video games alone or in a group?	Do you usually play video games online or in-person?
Dyad 1 - A	22	Male	White	Non-Hispanic	College	Nintendo 64, PlayStation 2-4, iPhone, Xbox360	During semester: 5 hours Out of School: 15 hours	Prefer to play with someone	N/A
Dyad 1 - B	21	Male	White	Non-Hispanic	College	Nintendo 64, PlayStation 3-4, iPhone, Xbox360	During semester: 3 hours Out of School: 20 hours	Prefer to play with someone	In-person
Dyad 2 - A	21	Female	White	Non-Hispanic	College	Xbox1, Wii	2-3 hours	Prefer to play with someone	In-person
Dyad 2 - B	24	Female	White	Non-Hispanic	College	Nintendo 64, Gameboy, iPhone	0 hours	Prefer to play with someone	In-person
Dyad 3 - A	21	Male	White	Non-Hispanic	College	Xbox1, Xbox360, Wii, PC	1 hour	Prefer to play with someone	In-person
Dyad 3 - B	21	Male	White	Non-Hispanic	College	Xbox1	6-10 hours	Prefer to play with someone	Online
Dyad 4 - A	20	Male	White	Non-Hispanic	College	PlayStation 3-4, Xbox1, 3DS, WiiU	20-40 hours	Prefer to play alone	In-person
Dyad 4 - B	20	Male	White	Non-Hispanic	College	PlayStation 3-4, Xbox360	5-15 hours	Prefer to play with someone	In-person
Dyad 5 - A	29	Male	White	Non-Hispanic	College	Xbox360	4 hours	Prefer to play with someone	In-person
Dyad 5 - B	28	Male	White	Non-Hispanic	College	Gameboy, Xbox360	71 hours	Prefer to play with someone	Online
Dyad 6 - A	23	Male	White	N/A	College	Xbox360, Wii	15+ hours	Prefer to play with someone	Online
Dyad 6 - B	20	Male	White	N/A	College	PlayStation 4	30+ hours	Prefer to play with someone	Online

Appendix B

Coding Scheme for Video Game Project

Code 1: Coding Initiation/Responses/Interruptions and On-Topic/Off-Topic

On Topic: related to video game

Off Topic: unrelated to video game

1A : On topic initiation

1B : Off topic initiation

2A+ : Obligatory on topic response (response to direct question)

2A- : Non-obligatory on topic response

2B+ : Obligatory off topic response

2B- : Non-obligatory off topic response

3A : On topic interruption

3B : Off topic interruption

Code 2: Communicative Intent

WN : wants/needs

SC : social closeness

IT : information transfer

SE : social etiquette

CM: commenting on video game

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EDUCATION

Pennsylvania State University, University Park, PA

May 2017

Schreyer Honors College

- Bachelor of Science in Communication Sciences and Disorders
- Minor in Special Education

RESEARCH EXPERIENCE

Undergraduate Research Assistant

March 2016-Present

Department of Communication Sciences and Disorders, Pennsylvania State University

- *Interaction in Active Video Game Play in Individuals With and Without Autism Spectrum Disorder*
- Principal Investigator/ Supervisor: Dr. Erinn Finke, Ph.D., CCC-SLP
- Attended weekly meetings to discuss upcoming tasks and procedures
- Collaborated with a research team to transcribe, code, and analyze video game players conversation
- Present research findings in Honors Thesis

SCHREYER HONORS COLLEGE THESIS

Conversational Analysis Of Neurotypically Developing Adults During Cooperative And Competitive Video game Play

April 2017

- Thesis Advisor: Dr. Erinn Finke, Ph.D., CCC-SLP

HONORS & AWARDS

- The Pennsylvania State University Dean's List

Fall 2013 - Present

SPEECH LANGUAGE THERAPY EXPERIENCE

Observation Hours

June 2014 – January 2016

- Obtained 25 of the required 25 observation hours
- Shadowed many different Speech Language Pathologists
- Experiences Included: Traumatic Brain Injuries, Stroke, Neurodegenerative Diseases, Autism Spectrum Disorders, Articulation, Language, Dysphagia
- Observation places include: Moss Rehab Einstein Healthcare Network, Hospital of University of Pennsylvania, Good Shepherd Penn Partners Rehab Hospital, Voorhees Pediatric Facility, George B. Fine Elementary School

Clinical Practicum Hours, Penn State Speech & Hearing Clinic

January 2016 - Present

Undergraduate Speech Clinician

- Received the opportunity as an Undergraduate to begin accumulating clinical therapy practicum hours
- Provide speech therapy services under the supervision of a clinician at Penn State
- Create lesson plans and come up with new creative ways to practice articulation therapy

PEDIATRIC EXPERIENCE

Voorhees Pediatric Facility

June 2012 – May 2013

- Volunteered two hours per week
- Worked with children with special needs - ages birth to 21 years old
- Read, played, colored and talked with children who had little to no verbal communication

WORK EXPERIENCE

Strive Physical Therapy, Voorhees, NJ

May – August 2015 & 2016

Patient Services Liaison

- Assisted in the new paperless chart system transition
- Scheduled patients for their following appointment
- Corresponded with patients regarding their physical therapy

LEADERSHIP/ ACTIVITIES

Alpha Phi Omega

September 2013-January 2017

- National Co-ed Service Fraternity
- Completed a minimum of 20 hours of service each semester on Fraternity, Campus and Community levels
- Leadership Positions:
 - *Assistant Pledge Guide (Fall 2014)*
 - Organized the pledge retreat
 - Assisted in the organization of pledge requirements
 - *Secretary (Spring 2015)*
 - Managed the marketing committee
 - Served on the executive board
 - Recorded and distributed meeting minutes each week
 - Designed and set up clothing orders for our chapter

Penn State American Association of University Women

August 2016-Present

- National philanthropy organization
- Advances equity for women and girls through advocacy, education, philanthropy and research
- Leadership Position:
 - *Secretary*
 - Served on the executive board
 - Recorded and distributed meeting minutes each week

Penn State IFC/Panhellenic Dance Marathon

- Rules and Regulations Committee Member THON 2014
 - Fundraised for the Four Diamonds Fund
 - Assisted in providing safety regulations for THON 2014
- Donor and Alumni Relations Committee Member THON 2015, 2016, 2017
 - Fundraised for the Four Diamonds Fund through donation boxes and reaching out to corporate donors
 - Assisted in giving tours to donors for THON 2015
 - Held a leadership position and led tours for THON 2016 & 2017