A Dissertation

entitled

Children with Autism Spectrum Disorders and Violent Media

by

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Submitted to the Graduate Faculty as partial fulfillment of the requirements for the

Doctor of Philosophy Degree in Psychology

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An Abstract of Children with Autism Spectrum Disorders and Violent Media
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The CDC estimates that 1 out of 175 to 1 out of 45 children in the United States meet criteria for Autism Spectrum Disorder (ASD), which is a life-long neurodevelopmental disorder that affects social interaction, language abilities, and overall daily functioning. Newly emerging research indicates that one-third of children with ASD demonstrate challenging, aggressive, and even violent behaviors. Five decades of research have found a complex but definite connection between violent media consumption and increased aggressive behavior. To date, few studies have examined how consumption of violent media may affect children with ASD. The present study used a mixed-method design to identify the immediate effects of violent media on the behaviors of 42 children from two Midwestern schools that exclusively serve children with ASD. Baseline behaviors during a period of free play, measured by trained coders using a structured behavior observation scale, were compared with the children’s behaviors while they watched a cartoon with violent themes. Challenging behaviors were also documented outside of the two observation conditions. Attention to the cartoon, previous exposure to the cartoon, and self-reported favorite television programs were also examined. Participants diagnosed with autistic disorder were more likely to exhibit one or more aggressive behaviors than participants with Asperger’s disorder or pervasive developmental disorder, not otherwise specified. This is reasonable given that children
who meet criteria for autistic disorder tend to be lower functioning and suggests that the structured observation scale was effective in identifying differences in behaviors. No statistically significant differences were found between aggressive behaviors during free play versus cartoon viewing, but only 11 of 42 children were able and willing to actually attend to the cartoon for any period of time. Qualitative analysis indicated that one fourth of the participants demonstrated a variety of challenging behaviors. In view of the importance of media for children with ASD, a possible causal relationship between exposure to violent media and challenging behaviors in this population remains an important question.
To those who remind me that no (wo)man is an island, nor should she wish to be.
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Chapter 1

Introduction

It is well-established that exposure to violent media can affect children in complex and often negative ways (Anderson, Gentile, & Buckley, 2007; Anderson, Gentile, & Dill, 2012; Anderson et al., 2010; Bushman and Huesmann, 2012; Funk, Baldacci, Pasold, & Baumgardner, 2003; Gentile & Bushman, 2012; Kirsh, 2006). The CDC estimates that 1 out of 45 to 1 out of 175 children in the United States meet criteria for Autism Spectrum Disorder (ASD), (Baio, 2014). ASD is a life-long neurodevelopmental disorder that involves deficits in language abilities, social interaction, and overall daily functioning (American Psychiatric Association, 2013). In addition to literature on exposure to media violence, there is also a growing body of research examining challenging behaviors and aggression in children with ASD (Carroll et al., 2014; Gadow, Devincent, Pomeroy, & Azizian, 2005; Frith, 2003; Hartley, Sikora, McCoy, 2008; Kanne & Mazurek, 2011; Lecavalier, 2006; Matson & Nebel-Schalm, 2007). It has been found that children with ASD have a preference for electronic screen media (ESM) over interpersonal interaction (Mineo, Ziegler, Gill, Salkin, 2009; Nally, Houghton, & Ralph, 2000; Shane & Albert, 2008), which is likely linked to the core symptoms of ASD. That is, difficulties communicating and comprehending the nuances of social situations can make such situations frustrating and unrewarding for children with ASD, while interactions with screen media are less stressful and more rewarding. Despite all of these facts, little is known about how these children’s daily media consumption may be affecting them.

Given our awareness of the impact of violent media consumption on neurotypical
children, the high prevalence of children with ASD, the challenging behaviors of many children with ASD, and their preference for ESM, it is crucial to connect these bodies of literature and determine in what ways and to what degree exposure to violent media impacts children with ASD. The majority of studies on challenging behaviors in children with ASD are based on parent and teacher report; thus, naturalistic observation in children’s everyday environments (e.g., school settings) is needed to assess baseline levels of challenging behaviors. In addition, systematic observation of behaviors during violent media consumption in a major first step in determining whether there is an immediate effect of violent media on these children’s overall level of physiological arousal and challenging behaviors.

In the present study, a structured behavior observation scale was used to examine the behaviors of 42 children ages 7 to 23 years in their school settings during a period of free play and while watching a cartoon with violent themes. Information regarding previous exposure to the cartoon, opinions about the cartoon, and other media preferences was also obtained when possible. This study could lay the foundation for future studies, as well as assist professionals, parents, and teachers who care for children with ASD better understand how to manage the effects of violent media on daily functioning and long term development.

The following chapters include a review of the literature on autism spectrum disorders (ASD), aggressive behaviors in children with ASD, the impact of violent media, and media use in children with ASD. Study methods are then described and results are presented. The implications and limitations of the study are then discussed, and directions for future research are explored.
Chapter 2

Literature Review

Characteristics of Children with Autism Spectrum Disorders

In the 1940s, the term “autism” was first used to describe a constellation of symptoms related to impairments in social relationships, language acquisition, and adaptability (Frith, 2003). The term has its roots in the Greek word *autos*, meaning “self.” Perhaps the defining characteristic of what are now known as autism spectrum disorders (ASD) is the manner in which individuals with these disorders appear to be trapped within themselves. That is, children with ASD are often overwhelmed by the surrounding environment and fixated on their own internal worlds. Based on the Diagnostic and Statistical Manual of Mental Health Disorders IV-TR (DSM-IV-TR), ASD are also known as pervasive developmental disorders (PDD) because of the disorders’ all-encompassing impact on most aspects of an individual’s normal developmental trajectory (American Psychiatric Association, 2000). The DSM-IV-TR diagnostic categories and criteria were used in this study because the literature upon which the study is based also used these categories and criteria. The DSM-5 now categorizes all previous subtypes under one diagnosis of Autism Spectrum Disorder (also ASD) because most available evidence suggests that it is different levels of functioning, and not distinct subtypes, that accounts for variation on the autism spectrum (American Psychiatric Association, 2013). It is estimated that 110 out of every 10,000 children meet criteria for ASD (CDC, 2012), which is a much higher prevalence rate than most other childhood disorders found in the DSM-IV-TR (American Psychiatric Association, 2000). There is a triad of symptoms that accompanies most cases of ASD: 1) impairments in
verbal and/or non-verbal communication, 2) difficulty with social interaction and relationships, and 3) atypicality related to repetitiveness and/or need for sameness (Frith, 2003); although DSM-5 now categorizes communication and social difficulties together because they so frequently co-occur (American Psychiatric Association, 2013).

The difficulties that children with ASD and their families experience as a result of the primary and associated symptoms have sparked a great deal of research on the possible causes and treatments of ASD. Advancements in ASD research have also helped demonstrate that these disorders have a neurobiological basis (Polleux & Lauder, 2004; Tager-Flusberg, 2008). There are a number of developing theories about the differences in the brains of individuals with an ASD compared with neurotypical individuals. One theory is that there is a dysfunction in the excitation and inhibition systems guided by the brain (Polleux & Lauder, 2004). This relates to the apparent over-stimulation by the environment demonstrated by many children with ASD. Another theory stems from findings of accelerated brain growth in the first years of life, followed by decelerated growth. These events may cause impairment in certain regions of the brain, such as those regions involved in facial recognition (Tager-Flusberg, 2008). Another more recently popularized theory, the “broken mirror theory,” proposes that individuals with an ASD may have a deficit of mirror neurons, which are thought to play a role in the recognition, imitation, and regulation of non-verbal social cues, such as facial expressions of emotion (Fan, Decety, Yang, Liu, & Cheng, 2010; Hadjikhani, Joseph, Snyder, & Tager-Flusberg, 2006). A genetic explanation has also been suggested. ASD, specifically autistic disorder, is four to five times more common in males than females (American Psychiatric Association, 2000; Frith, 2003), and the
disorders appear to have a large genetic component (Polleux & Lauder, 2004; Sandiin et al., 2014), meaning that a child is at in increased risk of being diagnosed with autistic disorder when a first degree relative has previously been diagnosed or when parents are carriers of certain genetic mutations. However, a distinct etiology for ASD has not yet been established; there is emerging evidence that the cause is multifaceted and related to both genes and environment (American Psychiatric Association, 2000; Frith, 2003, Sandiin et al., 2014; Tager-Flusberg, 2008).

Based on the DSM-IV-TR, there are several subtypes of ASD; the present study will focus on autistic disorder, Asperger’s disorder, and pervasive developmental disorder, not otherwise specified (PDD-NOS). These three subtypes of ASD are often studied together (Farmer & Aman, 2011), possibly because children with these diagnoses share many symptoms and are frequently placed together in schools and programs specialized for ASD. Autistic disorder is diagnosed when a child demonstrates symptoms from each of the three following categories: 1) social deficits, such as inability to regulate social interaction with nonverbal behaviors and lack of reciprocity or attempts to share experiences with others, 2) impairments in language, including delay in or absence of speech development, difficulty initiating or carrying a conversation with others, and repetitive or unusual use of language, and 3) rigidity of behaviors, interests, and activities, such as adhering to strict routines and demonstrating repetitive movements (American Psychiatric Association, 2000; Frith, 2003). Previous estimates of the prevalence of autistic disorder (excluding Asperger’s disorder and PDD-NOS) range from 1 to 10 cases per 10,000 individuals (American Psychiatric Association, 2000). However, the more recent estimates from the CDC are that 1 out of 45 to 1 out of 175
children in the United States meet criteria for all three subtypes of ASD combined, (Baio, 2014). These are rather wide ranges compared with other diagnoses, and may be accounted for by differences in classification and research methodology. In many cases, autistic disorder is accompanied by mild or moderate mental retardation (American Psychiatric Association, 2000, 2013).

Asperger’s disorder shares many features with autistic disorder, such as the social deficits and rigidity of behavior, interests, and activities described above (Attwood, 2007). There are also several distinct differences. Children with Asperger’s disorder do not have language delays and rarely experience intellectual disability or difficulty with most adaptive behavior, so the disorder may go undiagnosed for many years (Frith, 2003). While children with Asperger’s disorder do not typically demonstrate repetitive movement, they often experience motor clumsiness and stereotyped interests. Estimates of the prevalence of Asperger’s disorder are less than 1 to 8 cases per 10,000 individuals (Attwood, 2007). Like autistic disorder, Asperger’s disorder is more common in males than females and also more common in people who have relatives with the disorder than those who do not have relatives with the disorder. PDD-NOS is a subtype of ASD that is diagnosed when an individual demonstrates social deficits and other symptoms of autistic disorder or Asperger’s disorder but does not meet full criteria for these or other related disorders (American Psychiatric Association, 2000).

ASD is described by the American Psychiatric Association (2000) as “continuous and lifelong,” meaning that symptoms do not fluctuate dramatically or disappear with time. The symptoms that accompany autistic disorder tend to begin prior to the age of three years (Frith, 2003). Symptoms of Asperger’s disorder are often present from birth
but may not become especially problematic until later in childhood or adolescence, when social interaction becomes critical (Attwood, 2007). In all cases of ASD, symptoms continue to affect individuals throughout life. However, many of the core symptoms can be improved through early and intensive therapeutic intervention (Zachor, Ben-Itzchak, Rabinovich, & Lahat, 2007). Structured treatments that target problem behaviors, such as Applied Behavioral Analysis (ABA), have been shown to be effective across multiple studies (Peters-Scheffer, Didden, Korzilius, Sturmey, 2011). Treatments that address interpersonal difficulties, such as Relationship Development Intervention (RDI), also appear promising (Gutstein, Burgess, & Montfort, 2007). Medications have been explored to reduce symptoms, especially symptoms of irritability and aggression, but risks and side effects outweigh potential benefits in many cases (Aman, 2004; Robb, 2010).

There are an increasing number of studies examining the frequency and severity of challenging and aggressive behaviors in children with an ASD (Carroll et al., 2014; Gadow et al., 2005; Hartley et al., 2008). Although ASD are not defined by aggressive behaviors, there is a strong link between the diagnostic criteria and behavioral symptoms, such as impulsivity, destructive tantrums, and self-injury (Aman, 2004; Ando & Yoshimura, 1979; Farmer & Aman, 2011; Gadow et al., 2005; Lecavalier, 2006; Matson & Nebel-Schwalm, 2007; O’Reilly et al., 2010). In addition to ultimately helping to develop structured interventions, it may be that monitoring the daily environment of children with an ASD can help to influence their challenging symptoms. Examples of areas to monitor are the types of modeling of adults and peers demonstrate, overstimulation and abrupt changes in routine that trigger problem behaviors, and the
types of media to which children with ASD are exposed.

**Aggression and Challenging Behaviors in Children with Autism Spectrum Disorders**

Aggression is often defined as attempting or causing intentional harm, but this definition is extremely broad and can be problematic (Hartup, 2005; Kirsh, 2006). There is a great deal of controversy surrounding how best to define this term and what it should encompass, both among and within different professional arenas, such as psychology, juvenile justice, and education (Conner, 2002). In general, aggression can take the form of three types of harm: physical, verbal, and relational (Kirsh, 2006). Physical aggression is the most frequently studied and sometimes assumed to be the most damaging. It involves actions such as hitting, kicking, and using objects to cause physical injury and pain to a person or other living being. Destruction of inanimate objects is sometimes considered to be physical aggression as well (Kirsh, 2006). Verbal aggression involves yelling and making comments that are threatening, frightening, or hurtful to another person (Kirsh, 2006). Relational aggression is a more recently recognized and examined form of aggression, involving words and actions that are socially damaging to another person, such as lying to tarnish an individual’s reputation, or manipulating peers to ostracize an individual (Conner, 2002). Efforts have been made to classify aggression into further subtypes, but these are highly specific and not relevant for the purposes of the present study.

In order to determine when the aggression of children with ASD can be considered excessive and inappropriate, the topic of normative aggression in typically developing children must be understood. There is little doubt that human beings
demonstrate physically aggressive tendencies from a very early age; however, children do not innately understand that their use of physical aggression toward another person can result in harm and pain. (Conner, 2002; Zero to Three, 2009). A wide body of research on children’s cognitive and emotional development has led to classifications of the types of aggressive behaviors that are common to children at each developmental stage (Conner, 2002; Hartup, 2005; Kirsh, 2006;). Prior to age three years, it is fairly common for young children to use physical aggression to get their needs and wants met (often called instrumental aggression), such as shoving another child to take a toy. Other common behaviors that may look like hostile aggression are smacking, biting, and pulling the hair of their caregivers and playmates (Zero to Three, 2009). These behaviors are not aggressive per se, but are the result of the child’s lack of self-control and ability to communicate. Children under the age of three years are very gradually learning the connection between such behaviors and pain through the reactions of others around them (Zero to Three, 2009).

It is not until around the preschool years, age three to six, that children truly make the connection between the act of aggression and causing pain. They then begin to demonstrate aggression with the intention of doing harm, (Conner, 2002; Kirsh, 2006). Occasional behaviors such as playing roughly, smacking, kicking, and throwing objects at peers are fairly common. As typically developing children reach school age, approximately age six to ten, they begin to acquire an increased sense of self control and expressive vocabulary. Most of the previously exhibited physically aggressive behaviors become less common and more severe aggressive behaviors such as punching or using weapons are extremely rare (Connor, 2002). Children who continue to use frequent
physical aggression against others during the school years are generally considered to be experiencing a clinically significant problem, such as conduct disorder (American Psychiatric Association, 2013; Conner, 2002). Older children demonstrate a tendency for mild to moderate verbal and relational aggression over any degree of physical aggression, especially females. Children generally must have developed verbal abilities typical of their age in order to demonstrate these types of more sophisticated verbal and relational aggression (Conner, 2002; Kirsh, 2006).

**Frequency and severity of aggressive behaviors in children with ASD.** The types, frequency, and severity of aggression most often seen in children with an ASD are being described and examined in an emerging literature (Carroll et al., 2014; Gadow et al., 2005; Hartley et al., 2008; Kanne & Mazurek, 2011). The general conclusions are that aggression in this population is frequent and problematic. Aggression toward self and others is a common concern for family members, with one study finding that 53.7% of caregivers indicated their children with ASD demonstrated mild, moderate, or severe aggression (Carroll et al., 2014). One of the earliest studies on aggressive behaviors in children with an ASD was conducted by Ando and Yoshimura (1979). In a sample of 47 children (ages 6 to 14 years) with autistic disorder, they found evidence that these children were significantly more likely to attack others, destroy property, and throw violent tantrums compared with a sample of 128 children with intellectual disabilities (ID), based on teacher ratings on the Maladaptive Behavior Scale (MacDonald, 1988). Over one-third to one-half of the children from the ASD sample demonstrated these behaviors versus 1/25th of the children from the ID sample (Ando & Yoshimura, 1979). Children with ASD demonstrate additional behaviors that can be equally as problematic.
as physical aggression or destruction of property. These include extreme bouts of hyperactivity and self-injury (Frith, 2003; Matson & Nebel-Schalm, 2007).

More recent research on the frequency of problem behaviors in children with ASD has found comparable levels in these children and in children with several other clinical diagnoses. Research conducted by Gadow et al., (2005) compared school-aged children with ASD (specifically autistic disorder, Asperger’s disorder, and PDD-NOS; \(n = 284\)) with other clinical samples (Attention-Deficit Hyperactivity Disorder, Oppositional Defiant Disorder, and Conduct Disorder; \(n = 189\)) and with community samples \((n = 404)\) on parent and teacher ratings on measures of clinical disorders, including the Achenbach Child Behavior Checklist (CBCL). For both parent and teacher ratings, the researchers found that the children in the ASD sample and the children from the clinical sample were not significantly different on scales of all three types of attention-deficit/hyperactivity disorder (A-D/HD; inattentive, hyperactive, and combined type) or oppositional defiant disorder (ODD). Both samples were rated significantly higher than the community sample on these disorders. Parent-reported prevalence rates for symptoms of all types of A-D/HD were 59.2% (55.6% teacher) in the ASD sample, 56.4% (61.9% teacher) in the clinical sample, and 8.6% (16.4% teacher) in the community sample (e.g., non-clinical, typically developing children). Prevalence rates for ODD symptoms were 27.8% (29.2% teacher) in the ASD sample, 33.6% (33.3% teacher) in the clinical sample, and 4.9% (4.8% teacher) in the community sample. Prevalence rates for Conduct Disorder (CD) symptoms were 7.5% (9.2% teacher) in the ASD sample, 22.6% (22.4% teacher) in the clinical sample, and 2.2% (2.4% teacher) in the community sample. Related research (Hartley, 2008) on 605 children with an ASD...
(ages 1 to 5 years old), found that parents rated their children as having a clinically significant problem with emotional reactivity (18%) and aggressive behaviors (25%). All of these data indicate that children with ASD are demonstrating a similar degree of symptomatology related to problem behaviors, such as hyperactivity and defiance, as children with clinically diagnosable behavior disorders. A large percentage of children with ASD exhibit problem behaviors related to emotion regulation and aggression (Carroll et al., 2014).

Few studies have examined specific, item-level aggressive behaviors in children with ASD, possibly because few measures exist that are specifically designed for this population (Farmer & Aman, 2009). One such measure, the Nisonger Child Behavior Rating Form (NCBRF) was developed by Aman, Tassé, Rojahn, & Hammer (1996) to measure problem behaviors in children with developmental disabilities. Lecavalier (2006) used the NCBRF to examine parent ($N = 353$) and teacher ratings ($N = 437$) of problem behaviors in 6 to 12 year old children with an ASD. The most notable findings were that the proportion of parents and teachers who rated the children as moderate to severe on problems related to conduct was 18.9% and 17.5%, respectively. On the specific item “attacks people” almost 10% of parents and 15% of teachers endorsed this behavior as moderate or severe for the child being rated.

In order to assess problem behaviors specific to children with an ASD, and to help clarify the meaning of behaviors such as “attacks people,” Farmer and Aman (2009) developed the Children’s Scale for Hostility and Aggression: Reactive/Proactive (C-SHARP). A subsequent study conducted by Farmer and Aman (2011), examined the parent ratings on the C-SHARP for 365 children with ASD and 244 children with
intellectual disabilities (IDs). The results indicate that children with ASD do exhibit aggressive behaviors and some of the behaviors are more frequent than in children with IDs. The behaviors that were rated most frequently by parents of children with ASD generally involved “bullying” (e.g., throwing objects, shoving others, pulling others hair, and hitting) and “hostility” (e.g., shouting, reacting impulsively, and being hot-headed).

In addition to case studies and anecdotal evidence, emerging empirical evidence suggests that many of these problem behaviors do decrease to some degree through treatments such as ABA (Peters-Scheffer et al., 2011). However, problem behaviors, including aggression, do not remit entirely (Frith, 2003). Based on the current and emerging literature, it is evident that the majority of children with ASD demonstrate multiple forms of problem behaviors into early adulthood, and these problems negatively impact them and those around them (Ando & Yoshimura, 1979; Carroll et al., 2014; Farmer & Aman, 2011; Gadow et al., 2005; Lecavalier, 2006; Matson & Nebel-Schwalm, 2007; O’Reilly et al., 2010).

**Explanations for frequency and severity of aggressive behaviors in children with ASD.** As previously discussed, studies of physical aggression in typically developing children show a consistent pattern of gradual decline as children mature and receive corrective feedback from adults and peers (Conner, 2002; Kirsh, 2006). This is not necessarily the case for children with ASD (Frith, 2003). There are several possible contributing factors to this failure to decline, each of which is unique to children with ASD (compared with, for example, children with conduct disorder) because of the symptoms and associated features of ASD. The most relevant of these symptoms include language impairment (and a related low frustration tolerance) and failure to develop a
theory of mind (and a related tendency to have a reduced ability to empathize with others). Additional factors may be lack of shaping through gradual corrective feedback, extreme anxiety when faced with changes in routine, and (in children who have witnessed violent interactions) stereotyped speech in which aggressive words and possibly even actions may be repeatedly imitated (Williams, Whiten, & Singh, 2004).

One of the common explanations for the gradual decline in typically developing children’s use of physically aggressive behaviors is an increase in the ability to use language to express desires and frustrations (Hartup, 2006). Very young children and children with language deficits must rely on nonverbal communication to express their emotions. This has important implications for children with ASD who are not able to achieve typical language development; for example, it may leave them susceptible to learning and believing that aggression is the most effective means of getting their needs met. This is because of a cycle of reinforcement between caregiver and child that follows the same general script, whether the child is typically developing but too young to communicate verbally, or the child has language deficits related to ASD. In both cases, the child cannot verbally express his/her needs and becomes frustrated. The frustration builds until the child physically expresses his/her needs, usually in the form of hitting or throwing. If this is still ineffective, the child may break down into a tantrum that sometimes leads to further physical aggression towards the caregiver and possible self-injury. At this point the caregiver is equally frustrated, and may offer the child an array of rewards to calm the tantrum (Kazdin, 2008). Through this cycle the child learns that physical, and sometimes aggressive, expression of needs is effective. Typically developing children are increasingly able to express their needs verbally, and those less
sophisticated means naturally extinguish. This is not the case in children who have no or limited other means by which to communicate. The difference may be compounded in children who spend the majority of their days with other children on the autism spectrum who experience the same challenges.

Several studies have examined the relationship between language impairments and aggressive behaviors in children (Dominick, Davis, Lainhart, Flusberg, & Folstein, 2007; Estrem, 2005; Funk, Ruppert, & Jurs, 1984; Gadow et al., 2005). For example, Gadow and colleagues (2005) found a medium negative correlation ($r = -.19$) between expressive language skills and clinically significant levels of aggression on the Child Symptom Inventory (Gadow & Sprafkin, 1994) reported by parents. Another study conducted by Dominick et al., (2007) examined challenging behaviors in children with ASD compared to children with language impairment. They found no significant differences between the two groups on frequency of aggressive behaviors per parent report on a measure designed for the study. While this research may have benefited from the inclusion of a control group of typically developing children, as well as from using a validated measure of aggression, these results suggest that an inability to communicate needs and emotions is related to exhibiting physically aggressive behaviors. Based on these findings, it may be that children with ASD who have received more specialized services targeting at improving expressive and receptive language skills, (such as speech therapy), are less likely to demonstrate aggressive behaviors. This is because they would have an improved ability to communicate needs without resorting to aggression.

There has been research interest in whether or not children diagnosed with Asperger’s disorder, a specific subtype of ASD, are more prone to violent acts later in life
than those with other ASD because of the combination of independence in life skills (e.g., living and working unmonitored by family members or case managers) and social impairments associated with the disorder, such as misunderstanding others’ word choices and intentions (Allen et al., 2008; Attwood, 2007). The results of the research are mixed, but there is some evidence that Asperger’s disorder alone does not account for aggressive behaviors (Woodbury-Smith, Clare, Holland, & Kearns, 2006). Comorbid psychological disorders and environmental disadvantage are involved in many cases of individuals with Asperger’s who do commit crimes as adults (Allen et al., 2008), suggesting that it is not symptoms of Asperger’s disorder alone that account for their violent actions. Adults with this subtype of ASD do not have the same verbal deficits as individuals with other ASD and they generally exhibit fewer aggressive behaviors as children (Attwood, 2007; Frith, 2003). This may be further evidence of the link between aggressive behaviors and language impairments.

Another factor that could be contributing to differences in the frequency and severity of aggressive behaviors in typically developing children and in children with ASD is that typically developing children have gained a “theory of mind” by a certain age, while children with ASD may not have gained this awareness (Baron-Cohen, Leslie, & Frith, 1985; Colle, Baron-Cohen, & Hill, 2007). The concept of theory of mind was proposed over two decades ago by Baron-Cohen and colleagues (Tager-Flusberg, 2007) and involves an individual’s awareness that every person has his/her own wants, needs, thoughts, feelings, beliefs, and intentions (Colle et al., 2007). One general assessment of whether or not a child has acquired theory of mind is the “false beliefs test” in which children are told a story about a fictional child whose toy is moved by her friend while
she is out of the room. Children who guess that the character in the story will still believe her toy is where she left it are thought to have acquired a theory of mind. Children who guess the character will somehow know the information they know—that the toy was moved—are thought to have a poorly developed or absent theory of mind (Baron-Cohen et al., 1985; Colle et al., 2007). Typically developing children over the age of 4 years are able to pass this test, while most children with ASD do not pass the test at any age (Baron-Cohen et al., 1985).

Theory of mind has been criticized for not explaining the full constellation of symptoms in children with ASD (Tager-Flusberg, 2007). However, this theory provides a plausible explanation for aggression in children with ASD. It may be that these children’s use of aggression is similar to its use in typically developing infants and young children. That is, it is possible that many children with ASD cannot easily understand that their physically aggressive actions have resulted in harm for someone else (Farmer & Aman, 2011). Acquiring a theory of mind is also related to the development of empathy in children (Baron-Cohen, 2009). If a child cannot recognize that others have their own unique thoughts, feelings, etc., s/he cannot understand how others may be experiencing their environments. This includes the experience of pain and discomfort, as when a child with an ASD bites or slaps someone else. That child has little awareness of the consequences of aggression. Thus, the behaviors are not naturally extinguished as the child with ASD ages.

There is some evidence that children with ASD tend to treat the people around them as somewhat object-like when trying to obtain a desired stimulus that is out of reach (Phillips, Gomez, Baron-Cohen, Laa, Riviere, 1995). Rather than engage in joint
attention (e.g., pointing at a desired stimulus and looking back and forth between the stimulus and the person) like typically developing children, children with ASD have been found to direct or even push the person toward the desired stimuli, much as they would a stool (Phillips et al., 1995). This tendency for children with ASD to interact with other people as though they were objects may add to their difficulty understanding that others experience pain when physically harmed. Like deficits in theory of mind and affect regulation, this would also decrease the likelihood of aggressive behaviors being naturally extinguished over time and through corrective experiences.

**Media Violence and Children**

The literature on media violence spans five decades and consistently demonstrates a complex but definite connection between media violence exposure and negative outcomes (Anderson et al., 2010; Anderson et al., 2012; Anderson et al., 2007; Gentile & Bushman, 2012; Funk et al., 2003; Kirsh, 2006). In order to understand how exposure to media and media violence is impacting children, we must be able to clearly define what is meant by aggression, violence, and violent media. The definition of aggression has been explored in detail in the previous section, but it must also be defined in relation to media violence. Anderson and Bushman (2001) define aggression as acting in a way that intends physical harm to another person, cartoon, [or object], violence as a severe form of aggression, such as physical assault, sexual assault, or murder, and violent media as television, movies, video games, etc., that portray intentional acts of harm.

On the subject of violent media exposure, there remains a deep divide between those who believe that media violence has no effect on the vast majority of children who consume it and those who maintain that for some children there are lasting effects,
leading to increased risk for aggression at the cognitive, affective, and behavioral levels (Anderson et al., 2010; Bryfonski, 2014; Gentile & Bushman, 2012). The former view is typically held by the broader media industry and any other organization that stands to make a profit from the use of violent media (Bryfonski, 2014; Erwin & Morton, 2008). The latter view is held by most researchers who study media violence and has become increasingly endorsed by professional associations such as the American Psychological Association and the American Academy of Pediatrics (Gentile & Sesma, 2003). The primary reason that researchers, as well as reputable associations representing professionals involved in areas such as mental health, physical health, and child development, endorse this view is because, again, there is a consistent and ever-growing body of evidence indicating that exposure to violence in movies, television, and video games is related to a number of detrimental outcomes, especially in combination with other risk factors (Anderson et al., 2010; Anderson et al., 2007; Anderson, Gentile, & Dill, 2012; Gentile & Bushman, 2012; Gentile, Dongdong, Khoo, Prot, & Anderson, 2014; Funk et al., 2003; Kirsh, 2006).

The terms exposure and consumption are used somewhat interchangeably in much of this literature, but it has been noted that some differences exist between the two. Exposure implies a more passive experience, such as when parents turn on the nightly news while children do their homework. Consumption is when a child actively seeks out favored violent media and becomes engaged with it, such as rushing home after school to continue playing a popular online war game like World of Warcraft (Brockmyer et al., 2009). Because exposure to and consumption of violent media do not occur in isolation from one another, it has been difficult to examine the impact of each separately. Thus,
the terms will also be used interchangeably here, though with the recognition that differences in impact may exist.

**Quantity and types of media exposure.** The amount of time that children are involved with media is continually increasing, largely because the variety of media accessible to children is ever-expanding. This is true for children across the globe (Groebel, 2002). In addition to watching television and movies, children are also playing video games, surfing the Internet, and accessing multiple types of media on cellular phones and other handheld devices. Surveys on media consumption by American children find that, by the time they are seniors in high school, most children have consumed up to 30,000 hours of media (Rideout, Foehr, & Roberts, 2010), compared with 14,000 hours of classroom education (U.S. Department of Education, 2008). Approximately 20,000 of those 30,000 hours are spent consuming some type of television or movie content (which translates to about 1,300 hours per year or three and one half hours per day), whether it is on television, computer, or a handheld device (Rideout et al., 2010). The screen media that children are consuming involves a wide variety of genres and age ratings, but much of it portrays aggressive acts of some form (Kirsh, 2006; Wilson et al., 2002). Most children have been exposed to at least 200,000 acts of aggression or violence, including 16,000 murders, during the 20,000 hours spent viewing television and movie content, which is an average of at least ten acts of aggression and violence every hour (Bryfonski, 2014). In addition, all of these numbers may underestimate the total number of hours children are engaged in media because of the phenomenon of social desirability. Many parents and children tend to answer survey questions the way they believe others would answer the questions and in a way that
would portray them in a socially acceptable light (Kirsh, 2006). Therefore, children’s exposure to violent media may be even greater than is currently documented.

Both preadolescent children and children with an autism spectrum disorder tend to prefer television shows, movies, video games, and computer games that portray animated, frequently non-human characters (Kirsh, 2006; Shane & Albert, 2008). Media targeted at children 12 years and younger feature fewer acts of graphic violence than other types of media (Kirsh, 2006). However, nearly 70% of such media still contain an average of 14 acts of aggression per hour (Wilson et al., 2002). One 2001 study on violence in E rated video games, which are approved for “everyone” by the Entertainment Software Rating Board (ESRB), found that 64% of the games sampled \( n = 55 \) contained violence for an average of 35% of the time during 90 minutes of gameplay (Thompson & Haninger, 2001). These numbers are likely similar or greater in the present day. Given that two-thirds of American households do not have firm rules about media consumption for school-aged children (Rideout et al., 2010), it seems likely that many children are being exposed to other types of age-inappropriate media. In addition, with the rise in popularity of animated media targeted towards older children and adults, such as South Park and Family Guy, it is possible that younger children are exposed to cartoons that do exhibit graphic violence.

Cartoon violence in children’s programming is often dismissed as harmless (Peters & Blumberg, 2002). This may be because it often does not contain many of the elements that lead parents and children to perceive media violence as harmful (Kirsh, 2006). One of these elements is seriousness or lack of a comedic tone. When the context of aggressive acts is one of humor and levity, such as when the Road Runner repeatedly
smashes Wiley Coyote into a pancake using clever tricks and heavy anvils, older studies have found that parents do not report perceiving the cartoon to be violent (Kirsh, 2006). Interestingly, the research is mixed regarding how children identify and perceive violent acts in cartoons with comedic tone, suggesting that they may be more likely to identify any aggressive act as violent when compared with their parents (Kirsh, 2006). Both parents and children tend to identify aggressive acts in cartoons without a comedic tone as violent, such as those based on superheroes from comic books like Batman and Spiderman. Also, when the use of violence appears to be justified, such as when a protagonist is protecting a helpless victim, it may be perceived as less harmful than gratuitous violence (Wilson et al., 2002).

The degree to which the violence is realistic and graphic is related to how violent the cartoon is perceived to be by parents and children (Kirsh, 2006). Graphic violence typically includes the use of detailed animation or special effects to portray blood and realistic bodily damage. Most cartoons intended for preadolescent children do not portray bodily damage in realistic ways (Wilson et al., 2002); they instead keep the character intact but contorted, such as in the Wiley Coyote example described above. Depictions of blood and gore are generally absent. Adults and children both report that graphic violence is disturbing to them (Kirsh, 2006). There is some evidence that the less exposure people have to graphic violence the most disturbing they find it; in addition, how disturbing a viewer perceives the images to be is related to their perception of the degree of violence (Kirsh, 2006). This may explain why parents and children consider most cartoons to be less violent than media that has a high degree of graphic violence; a cartoon fight with implied damage is likely much less disturbing than a live action assault.
with weapons and life-threatening damage.

Although a cartoon may not be identified as violent because of its comedic tone or unrealistic consequences, it may still have a detrimental impact on children. Parents are more lenient about the amount of time children are permitted to watch comedic cartoons (Rideout et al., 2010), likely because they do not perceive these types of cartoons as harmful. These types of cartoons may trivialize violence and lead children to believe that, under some circumstances, it can be entertaining or rewarding to hurt others. In addition, they can also give children the impression that hurting others does not actually cause damage or that the damage is transitory. These messages are likely confusing to children who are in the process of learning about appropriate social behaviors and bodily safety (Gentile & Sesma, 2003).

Most available studies on parents’ and children’s perceptions of violence in cartoons were conducted over a decade ago and additional updated research is needed. One study of 300 parents and their children ages 8 to 13 years from multiple countries found that, when mean responses to perceptions of different types of television programs were placed into three categories (positive, neutral, and negative), action was perceived negatively by parents, cartoons, drama, comedy, and MTV were perceived as neutral, and news and educational programs were perceived positively (Abanto, 2004). The children in the study did not perceive any types of television programs negatively; they perceived action, cartoons, drama, comedy, and MTV as neutral, and they perceived news and educational programs positively (Abanto, 2004). It is possible that parents continue to perceive cartoons with a comedic tone and less graphic violence as less harmful than other cartoons. This may be because contemporary animated media (again, for example,
South Park, Family Guy, and especially video games) depict violent images that are much more realistic and graphic when compared with earlier examples used in studies on parent and child perceptions (Anderson et al., 2007; Engelhardt, Bartholow, Kerr, & Bushman, 2011; Funk, Flores, Buchman, & Germann, 1999). The marked and ever-increasing contrast between comedic, non-graphic cartoons and this newer media may even serve to decrease the degree to which parents perceive cartoons in children’s programming as violent.

Another argument frequently made about the harmlessness of cartoon violence is that even preschool-aged children are able to distinguish between fantasy and reality (Peters & Blumberg, 2002). While older children who are neurotypical are able to fully distinguish between fantasy and reality, children under the age of eight years tend to make this assessment on a case by case basis (Kirsh, 2006). For example, even if a young child has established that the characters in Spongebob Squarepants do not really live in the sea, s/he may still believe there is a monster in his/her closet. Therefore, understanding that one favored cartoon character/show is fictional does not automatically translate to other characters/shows. It is not until the age of 8 years that most children can consistently distinguish between fantasy and reality (Kirsh, 2006). Regardless of when and how children are able to understand the difference between fantasy and reality, many young children are as upset by the violent and frightening actions of fantastical characters as they are by realistic ones (Kirsh, 2006).

**Impact of violent media exposure.** Multiple theories have been proposed to explain the relationship between violent media consumption and detrimental outcomes. Currently, the most well-studied and accepted is the General Aggression Model proposed...
by Anderson, Bushman, and colleagues (Anderson et al., 2012). This model integrates theories of social learning, social cognition, affective aggression, excitation transfer, and human development to provide an explanation of aggression that is both theory-driven and functional (Anderson et al., 2007). This model organizes all of the variables that contribute to eventual aggressive action into 1) those that have a long-term influence upon a person (distal causes and processes) and 2) those that have a more immediate, situation specific influence (proximate causes and processes). The primary distal causes and processes involve biological predisposition and previous environmental experiences. An individual’s neurobiology and environment are perpetually interacting with and modifying one another. Both neurobiology and environment have a tremendous influence over an individual’s temperament at birth and his/her personality development during childhood. The primary proximate causes and processes involve a present given situation, the individual’s immediate internal states (cognitions, affect, and level of physiological arousal) at the time of the situation, and the individual’s appraisal of the situation.

When a child’s environmental experiences involve exposure to aggression and violence, (whether through media, family, or community), these experiences can influence their developing personalities as well as areas of the brain involved in arousal, impulsivity, and aggression. Likewise, children with more difficult temperaments and a proclivity toward aggression may be drawn to violent media. It cannot be said that one consistently comes first (Bryfonski, 2014). Both of these distal factors then play a role in children’s actions at the proximate level. For example, assume that a child who has been exposed to violence and has violent tendencies is placed into an ambiguous social
situation. A classmate bumps into this child in the hallway (i.e., a present given situation). The child could be in a multitude of internal states (thinking about something positive or negative, feeling irritable and hungry or calm and well fed, etc.). All of this can influence how the child interprets the situation: in a hostile (“that kid hit me on purpose!”) or neutral (“there wasn’t enough room for him to pass by without bumping me”) way. The interpretation then leads to a reaction. When most of the distal and proximate factors are directed toward an aggressive response, the child may react by, for example, hitting his classmate in the face. When enough of the factors are directed toward a more neutral response, the child may choose not to react or to react non-aggressively.

Long term exposure to violent media influences children at the distal level by contributing to children’s overall environmental experiences, leading children to perceive aggression as normal; in other words, they become desensitized to it (Bushman & Anderson, 2009; Anderson et al., 2012; Funk et al., 2004). Gentile (2003) describes the long term impact of violence in media as very similar to the impact of advertising. Most people—children, adolescents, and adults alike—gradually become influenced by repeated exposure to commercial endorsements of certain products. A single commercial may not influence someone dramatically enough to convince them to purchase a product, but repeated exposure increases the likelihood that the viewer will be influenced enough to change his/her thinking and behavior regarding the product. Repeated exposure to violent media may increase the likelihood that the viewer’s thoughts and behaviors will be influenced by them. That is, the viewer finds violent behaviors increasingly acceptable and is desensitized to the reactions violent behaviors would otherwise
normally provoke.

Exposure to media violence may influence children immediately at the proximate levels by priming them to think and behave aggressively (Anderson et al., 2007; Bushman, 1998; Gentile, 2014; Kirsh, 2006). Cognitive processes involved in retrieving information stored in the brain are thought to make use of networks of related information (Anderson, 2005). Priming involves exposure to stimuli that activate particular networks and increase the likelihood of access to cognitions within the same network. Priming applies to exposure to violent media in that exposure has been found to activate aggressive networks. Bushman (1998) studied reaction times to words that were aggressive and non-aggressive after viewing violent and nonviolent video clips. He found significantly faster reaction times to aggressive words in the violent video condition compared with the nonviolent video condition. Similar studies have found a connection between violent stimuli and access to aggression-related constructs, strongly indicating that violent media have a priming effect on the related cognitions (Kirsh, 2006), and possibly behaviors (Anderson et al., 2007), of those who consume it.

Effects of media violence on domains of development and functioning. When the literature has examined the effects of media violence on specific domains of children’s development and functioning, increasingly compelling arguments are given about these effects. Numerous domains have been examined, but those most relevant to children with autism spectrum disorders are aggression as a means of problem-solving, prosocial versus antisocial attitudes and behaviors, and level of physiological arousal in the presence of violent stimuli. These domains relate closely to the symptoms and deficits found in children with ASD and are discussed below.
The concept of aggression as a means of problem-solving involves both cognitions and behaviors. Children’s tendency to believe that aggression is acceptable, and their tendency to behave aggressively, have both been related to the amount of violent media they consume (Anderson et al., 2010; Kirsh, 2006). Aggressive cognitions are especially likely to increase when the media is interactive, as with video games (Anderson et al., 2010). Aggressive cognitions are indicative of pro-violence attitudes; examples of aggressive cognitions are “I could beat someone up if they messed with me,” or “It was really cool when that bad guy got shot” (Funk et al., 2004).

Whether the media children are consuming are explicitly vicious and graphic, or comedic and subtle, children are receiving information about interpersonal interactions and problem-solving. As addressed under the topic of normative aggression throughout development, very young children have a proclivity toward aggressive behaviors as a means of problem-solving. For example, when another toddler has a toy that a child decides he wants, he will most likely take the toy with force. It is only through repeated correction and modeling by adults that children learn more socially appropriate and peaceful ways to have their needs met. When aggressive models are provided for children, they may imitate those models instead of the corrective models.

Classic cartoons such as Road Runner and Tom and Jerry are replete with examples of using harm to solve problems (Wilson et al., 2002). When aggression is not only modeled but directly rewarded, as it is in electronic games, the likelihood that aggressive behaviors will occur is increased (Anderson & Bushman, 2001; Anderson et al., 2007; Funk et al., 2003). Many video games reinforce violent actions through acquisition of new weapons, goods, points, or powers. The modeling and reinforcement
found in violent media have the potential for some degree of impact on children, depending on other risk and protective factors (Gentile, 2002).

Risk factors for negative impact from violent media, whether television shows, movies, or video games, have been well-studied (Anderson et al., 2012; Gentile & Bushman, 2012). There is a delicate interplay between violent media consumption, gender, exhibiting prior aggression, experiencing physical abuse or bullying, and lack of parental monitoring of media consumption (Abanto, 2004; Gentile & Bushman, 2012). Gentile and Bushman (2013) found that risk factors tend to have a “Gestalt effect,” meaning that examining a combination of these risk factors predicted future aggression better than examining a single risk factor alone. Protective factors that foster resilience in children after exposure to violence have also been well-studied (Gentile & Bushman, 2012). These include exposure to nonviolent media (e.g., educational, prosocial), being female, having supportive and nurturing relationships with adults, having a healthy peer group, and close parental monitoring of media consumption. As with risk factors, it is likely that examining these protective factors in combination predicts future behaviors better than examining single protective factors alone. That is, the more protective factors a child has, the less likely s/he is to behave violently.

Prosocial attitudes include the belief that others are generally good and well-meaning, and prosocial behaviors include the tendency to be cooperative and helpful towards others. One study found that playing video games with prosocial themes and goals decreased hostile attributions about others and decreased antisocial cognitions in the short term in a sample of university students (Greitemeyer & Osswald, 2009). It has proven more difficult to show long-lasting effects of prosocial media, but it seems
possible that such media may have positive impact for some individuals. Most professionals agree that television clips and video games can be used very effectively as educational tools and prosocial models for children preschool-aged and older (Kirkorian, Wartella, & Anderson, 2008), especially for children with special needs (Charlop-Christy, Dennis, Carpenter, & Greenberg, 2010; Nickopoulos & Keenan, 2007, 2003; Tereshko, MacDonald, & Ahearn, 2010). On the other hand, there is evidence that playing violent video games, (which often endorse and reward criminal behavior such as robbery, physical attack, rape, and murder), is related to tendencies toward antisocial attitudes and behaviors (Bushman & Anderson, 2009). A recent meta-analysis conducted by Anderson et al., (2010) examined experimental studies of violent video game playing and prosocial behavior in over 9,600 participants. Their analyses indicated that violent game-playing led to immediate decreases in helping behaviors ($r = -.22$). They conclude that the decrease in prosocial behaviors is likely context-specific, but should be recognized as an important short-term effect.

A growing number of studies have examined the effects of violent media, particularly the effects of video game playing, on physiological arousal. Anderson et al. (2010) reported that playing violent video games led to a significant increase in physiological arousal as measured by blood pressure and heart rate. The autonomic nervous system involves two subsystems: one (the sympathetic nervous system) increases arousal in response to danger or other signals that require high alert, and the other (the parasympathetic nervous system) decreases arousal in response to safety and other signals that do not require high alert. Although studies show the high alert system is active during exposure to violent stimuli, there is evidence that repeated exposure leads to
a gradual decrease in arousal (Carnagey, Anderson, & Bushman, 2006; Krahé, Möller, Huesmann, Kirwil, Felber, & Berger, 2010). Carnagey, Anderson, and Bushman (2006) tested the notion that repeated exposure actually leads to decreased arousal over time. In essence, the high alert system may respond less and less to the violent stimuli when exposure is repeated or prolonged. The researchers asked college students about their media habits and typical levels of aggression, and then had them play twenty minutes of violent or nonviolent video games. Afterwards, the students were shown a ten minute video of real life violence while their heart rates and electrodermal responses (i.e., change in skin’s ability to conduct electricity, usually in response to an emotional stimulus) were measured. Students who had played the violent video games had significantly lower physiological arousal than the students who played nonviolent games. Although a causal link cannot be established in studies with this design, it certainly suggests the possibility of desensitization (Fanti, Vanman, Henrich, & Avraamides, 2009). If true, then desensitized players may seek out violent games of increasing intensity to maintain a high level of arousal (Bushman & Anderson, 2009).

An immediate causal effect of exposure to media violence on subsequent aggressive behavior was examined in adults (Engelhardt et al., 2011). A statistically significant increase in aggressive behaviors was found (measured by having participants deliver unpleasant noise blasts to fictitious opponents) for participants who played a violent video game in the laboratory compared with those who played a nonviolent video game. To ascertain desensitization to still photographs of actual violence, this study also examined neural activity linked to arousal and aversion to unpleasant stimuli. Findings indicated participants with low levels of previous exposure to violent video games who
played the violent video game in the laboratory demonstrated less aversion to violent images based on their lower levels of neural activity, while similar participants who played the nonviolent video game showed greater aversion to violent images. Participants with high levels of previous exposure to violent video games showed less aversion to violent images regardless of the type of video game played in the laboratory. All of these findings confirm causal links between exposure to violent media, desensitization, and aggressive responses. Although it would be difficult to conduct a similar study with children, it is likely that their developing brains are even more susceptible to these effects than adults’ brains.

**Children with ASD and Electronic Screen Media**

There is a modest but growing body of research examining children with ASD and the use of electronic screen media (ESM) as a tool for learning (Mineo et al., 2009; Nickopoulos & Keenan, 2007, 2003; Tereshko et al., 2010) and for recreation (Nally et al., 2000; Shane & Albert, 2008). It should be noted that the existing literature on children with ASD operationally defines the term “children” somewhat differently than literature on typically developing children. Children with ASD are often defined as being anywhere from 3 years old to 21 years old. One reason for this is that, similar to children with only intellectual disabilities, children with ASD may require assistance throughout their entire lives and often stay in the public school system until age 21. Children with ASD do not often follow the same developmental trajectory as typically developing children. For over a decade, anecdotal evidence from parents of children with ASD has indicated that these children are preoccupied by media more than almost any other daily activity (Nally et al., 2000). Despite this, research on the media habits of children with
ASD has been slow to progress (Shane & Albert, 2008). Thus far, the majority of that research has focused on the potential for ESM to teach prosocial behavioral scripts and improve language acquisition (Charlop et al., 2010).

**Video modeling.** The use of video modeling as a teaching tool for children with ASD has been growing in popularity (Charlop-Christy et al., 2010; Mineo et al., 2009; Tereshko et al., 2010). This is due in part to the emerging evidence of these children’s visual-spatial strengths (Mineo et al., 2009) and proclivity toward ESM (Shane & Albert, 2008). A small study by Charlop-Christy et al. (2010) used video modeling to teach three children with autistic disorder (between the ages of 7 and 11 years) to acquire four socially expressive target behaviors: verbal comments, intonation, gestures, and facial expressions. It took only three to four viewings of the video for all three children to acquire the target behaviors. The researchers also assessed for generalization of the behaviors to other settings, and found that the children continued to demonstrate them appropriately, at least on a short term basis. This indicates that children with ASD are able to learn from video sequences and actually imitate the scripts and behaviors they have learned and apply them in everyday life.

Another video modeling study was designed to teach young children with ASD how to build several toys by watching and imitating a series of steps that had been prerecorded (Tereshko et al., 2010). Through observational learning, the children in the study were able to accomplish tasks that they previously could or would not accomplish. These and other similar studies demonstrate how rapidly and naturally images on a screen are learned and imitated by children with ASD (Boudreau & D’Etremont, 2010; Nikopoulos & Keenan, 2007; Wang, Cui, & Parrila, 2011). It follows that this imitation
may not be limited to images that are positive and constructive. If they are exposed to aggressive scenes from violent media, children with ASD may also learn from and imitate images that are negative and potentially damaging.

Management and consumption of ESM. Parents of children with ASD face myriad challenges when trying to address the symptoms and improve the lives of their children. As online forums for parents indicate, (such as the one hosted by the organization Autism Speaks (see http://autismspeaksnetwork.ning.com/), determining how much and what types of media their children should be permitted to consume is one of their major daily challenges. A content analysis of focus group discussions among six parents with children on the autism spectrum (Nally et al., 2000) revealed several important commonalities among the parents’ beliefs about their children’s ESM viewing. Parents in the study found television and video viewing, in particular, to be a source of stress in the home. Several reasons given for this stress were the children’s extremely strong affinity for television/video and their need to watch the same content repeatedly. Approximately half of parents from another study reported that their children “never” or “occasionally” tolerate being in the same room with a television that is turned off (Shane & Albert, 2008). Another reason that parents cited ESM as a source of stress was the lack of a consistent long term strategy for managing the amount and content of viewing. Other studies have found similar parental frustration with managing ESM exposure. For example, in one survey, parents of children with ASD reported only being able to monitor their children’s exposure 62% of the time (Shane and Albert, 2008).

Parents from the focus group run by Nally et al., (2000) also expressed some concern that their children’s viewing habits further isolate them from the rest of the
family, possibly exacerbating their symptoms. Several parents reported unpleasant experiences with professionals, whom they felt judged and disapproved of their management of television in the home. Although the parents did cite some positive uses of ESM in the home, the overall implication of the study results is that parents of children with ASD are concerned about their children’s media consumption. Parents expressed that they would like assistance with improving the role of television/video in their homes, but not if that assistance is given in a way that criticizes the parents (Nally et al., 2000).

In general, the literature indicates that children with ASD have a strong preference for television and video, especially compared with actual social interactions (Mineo, Ziegler, Gill, Salkin, 2009; Shane & Albert, 2008). One reason for this may be that video and television provide verbal and visual stimulation without the demands of reciprocal social exchanges (Mineo et al., 2009). For example, children with ASD are not expected to monitor the facial expressions and other nonverbal social cues of characters in a television show in the same way they are with people in their daily lives. There is also evidence that children with ASD tend to have well developed visual-spatial skills relative to their verbal skills (Mineo et al., 2009). This may also contribute to their strong affinity for ESM because children with ASD can view and visually process actions on the screen, such as character interaction, educational games, and written words, instead of merely hearing about such actions.

A survey of 89 parents and caregivers conducted by Shane and Albert (2008) provided an overview of leisure activities and media consumption in children with ASD. Among the primary findings was the tendency for children in the study to spend more time on ESM than on any other activity (e.g., indoor play or reading) throughout the
week. Over one-quarter of the parents in the sample reported that their children spent three or more hours per day on television and videos. This number is similar to the numbers reported in larger scale surveys on the media habits of typically developing children (Rideout et al., 2010), but the survey conducted by Shane and Albert (2008) was highly face valid. Given the evidence that parents of children with ASD are sensitive to the topic, they may have been especially susceptible to the effect of social desirability, resulting in underestimation on surveys with face valid items. In addition, it is possible that children with ASD are spending some of their time at school engaged with ESM. By anecdotal parent report it seems possible that children with ASD are consuming more media than typically developing children, but further research is needed. Nonetheless, they are consuming at least as much.

In the survey conducted by Shane and Albert (2008) parents were asked to list their children’s favorite television shows and videos. Parents reported a strong tendency (66%) for their children to prefer animated characters over real human beings. The survey also inquired about the frequency of behaviors surrounding media consumption, such as verbal imitation and physical acting out of favored scenes. Parents reported a strong tendency for their children to mimic the characters on screen by repeating favorite phrases over and over and sometimes by acting out previously viewed actions. Children typically demonstrated these behaviors after viewing the ESM, but sometimes did so while viewing it. In either case, these children could be developing verbal and behavioral scripts that they may play out in multiple aspects of their daily life, whether they are at school, in a grocery store, or preparing for bed (Charlop-Christy et al., 2010). This is a large part of the reason that video modeling has become increasingly popular as a means
of teaching appropriate scripts. Unfortunately, not all of the scripts that children encounter in real-life demonstrate appropriate behaviors; as suggested by the literature on violent media and children, many are likely to be aggressive and potentially harmful.

**ESM and children with special needs.** To date, only one study has been conducted that addresses the potential negative effects of ESM exposure on children with ASD (Mazurak & Engelhardt, 2013), despite the fact that emerging research has suggested there could be both positive and negative effects on these children (Charlop-Christy et al., 2010; Mineo et al., 2009; Nally et al., 2000; Tereshko et al., 2010). This study examined video game playing only, comparing 56 males with ASD, 44 males with A-D/HD, and 41 typically developing males with an average age of 11-12 years old. The majority were verbal and had average or above average cognitive abilities. The primary findings were that children with ASD demonstrated a greater degree of problematic video game use than typically developing children. Problematic was defined as desiring to play more than two hours per day and resisting strongly when being asked to stop playing. Notably, typically developing children in the study preferred “shooter games” (i.e., games in which the characters use weapons such as guns to kill others and meet some objective), at a statistically significantly higher rate than children with ASD. Mazurak and Engelhardt suggested that this may be because such games are too over-stimulating and anxiety-provoking for many children with ASD.

No studies have examined negative effects of viewing cartoons with aggressive themes on children with ASD. The most related studies were conducted almost two decades ago, and examined the immediate behavioral effects of violent versus nonviolent media on children with disruptive behaviors (Grimes, Vernberg, & Cathers, 1997) and
children with learning disabilities (Sprafkin, Gadow, & Grayson, 1987). Overall, the findings have been mixed. Some results indicate that aggressive behaviors increase after both violent and nonviolent video clips. Others found no statistically significant differences in aggressive behaviors between groups viewing neutral and violent cartoon clips. The explanation for these mixed findings is unclear, but it may be that, because children with ASD are prone to anxiety and sensory reactivity in response to novel stimuli, other effects may be masked (Marurek & Engelhardt, 2013).

One study in particular supports the notion that children with special needs could be differently affected by violent media than typically developing children. Grimes, Vernberg, and Cathers (1997) examined the reactions of children from four groups (ages 8-12) after viewing violent live action scenes from movies. The four groups were children formally diagnosed with attention-deficit/hyperactivity disorder (A-D/HD), oppositional defiant disorder (ODD), conduct disorder (CD), and a non-clinical community sample. The findings indicated differences between the first three groups and the community sample on measures of emotional responsiveness and attribution of blame. The children in the first three groups displayed less emotion in response to the victimization of an innocent character and were more likely to consider the violence justified. The researchers suggested that these findings could reflect differences in how violent messages are processed by children with disruptive behavior (largely due to distal and proximate causes) compared with non-clinical controls.

Several studies used neutral and aggressive scenes from cartoons to examine the effects on children with emotional disturbance (Gadow, Sprafkin, & Ficarrotto, 1987; Sprafkin, Gadow, & Grayson, 1988) and learning disabilities (Sprafkin et al., 1987). The
studies conducted by Gadow, Sprafkin, and Ficarratto (1987) involved preschool-aged children with a variety of disruptive behaviors and emotional disturbance. In the first of their studies, the researchers observed the aggressive behaviors of 9 children (3 to 5 years old) who were classified as emotionally disturbed. Behaviors were observed at baseline, after a neutral cartoon clip, and after an aggressive cartoon clip in both structured and free play activities. There were no statistically significant main or interaction effects. In case these results were spurious and related to the sample size, the researchers conducted a second study with a nearly identical design; this study involved 17 children and only behaviors during free play activities were observed. This second study identified an increase in nonphysical aggression after viewing both types of clips. The researchers were not examining immediate effects, but behaviors at various intervals over the course of several weeks. This may account for the mixed results, but it is notable that both types of cartoon clips seemed to have affected the children. The researchers suggest that any type of media may stimulate children with emotional disturbance and result in physiological arousal.

The studies conducted by Sprafkin, Gadow, & Grayson (1988; 1987) involved a similar methodology. Research with children with emotional disturbance yielded similar results as the studies conducted by Gadow et al., (1987) on the same population. This study examined the behaviors of 26 children at baseline, after a neutral cartoon clip, and after an aggressive cartoon clip during both lunch and recess. Results were surprising in that, after viewing the neutral clip, the children demonstrated significantly more nonphysical aggressive behaviors in both settings, and more physical aggressive behaviors in the recess setting. Another study involving children with learning
disabilities (Sprafkin et al., 1987) using a similar design involved 46 children with an average age of 7.6 years and again found no main effects for type of cartoon scene viewed. The researchers found that children in a lower IQ group displayed significantly more physically aggressive behaviors after viewing neutral cartoons than after viewing aggressive cartoons. The findings from these studies are puzzling and difficult to explain (Sprafkin et al., 1987), but a need for more stringent methodology might have contributed to these findings.

Given the fact that children with special needs show a preference for ESM over other activities (Erwin & Morton, 2008; Nally et al., 2000, Shane & Albert, 2008; Sprafkin et al., 1987), further studies on the effects of cartoon violence on these populations, especially children with ASD, are needed. In future studies, improvements in methodology, such as using a combination of qualitative and quantitative dependent measures, could help to clarify perplexing findings such as those above and provide further practical information for professionals, parents, and teachers.

**Children with ASD and Violent Media**

Despite the fact that 1) children with ASD frequently exhibit problem behaviors, including aggression toward self and others; 2) children with ASD spend much of their leisure time consuming media and 3) there is a well-established connection between consumption of violent media and an increase in aggressive thoughts, emotions, and behaviors in some children, no published research was found examining the quantity and types of violent media children with ASD consume, or the effects of such media on children from this population. Based on the literature from these three areas, several questions have been raised. These involve the quantity and types of media that children
with ASD consume, how children with ASD are affected by violent media in relation to the General Aggression Model, and how exposure to violent media may affect their development.

**Quantity and types of media exposure.** As previously described, only one survey and one parent focus group (Nally, Houghton, & Ralph, 2000) were found that examined the media habits of children with ASD. Additional research is clearly needed, but current information suggests that children with ASD of all ages consume as much if not more media (specifically animated television and movies) than typically developing children. It has been reported that, on average, parents monitor their children’s media consumption less than one-third of the time (Rideout et al., 2010), and this may be even less for children with ASD (Shane & Albert, 2008). This is because parents of children with ASD have indicated that many children do not tolerate an electronic device being off when the device is in their presence (Shane & Albert, 2008). For example, parents from the focus group conducted by Nally, Houghton, and Ralph (2000) reported that they often ended up allowing their children to control television and computer time rather than deal with a major tantrum.

**Impact of media violence exposure.** Applying the General Aggression Model (Anderson & Bushman, 2001) to children with ASD requires some additional considerations. Based on the model, the primary distal causes of aggressive behaviors involve biological predisposition and environmental experiences. Children with ASD enter the world with a different neurobiological makeup than typically developing children, and these differences are only beginning to be understood (Polleux & Lauder, 2004). It is acknowledged that children with ASD process sensory and social information
differently (Hadjikhani et al., 2006). However, it is difficult to be certain how children with ASD, especially those with severe language deficits, experience their environments. Parents and professionals can only guess at the child’s experiences based on behavioral cues. These external behavioral cues may act as a proxy for internal physiological arousal, especially when it is difficult or impossible to measure heart rate or electrodermal response in children who are too sensitive and uncomfortable to tolerate such measurement. Exposure to media violence could influence areas of the brain involved in arousal, impulsivity, and aggression, as well as these children’s developing personalities and ASD symptoms.

Based on the GAM, the primary proximate causes of aggressive behaviors involve the situation, the person’s immediate internal states (cognitions, affect, and level of physiological arousal) at the time of the situation, and the person’s appraisal of the situation. Exposure to media violence can influence typically developing children immediately at the proximate levels by priming them to think and behave aggressively (Anderson, et al., 2007; Bushman, 1998; Kirsh, 2006). Given the tendency of children with ASD to mimic what they hear, often repeatedly (Frith, 2003; Shane & Albert, 2008), it seems highly likely that children with ASD are also susceptible to the effects of aggressive priming. Recall the example of a typically developing child who was bumped into by a classmate. Imagine a similar child, except that he has been diagnosed with an ASD. If he has had long term exposure to media violence and demonstrates challenging and aggressive behaviors regularly (distal level), and then gets bumped into, he may be even more likely than the typical child to react aggressively. The proximate level causes—his internal state and his interpretation of the situation—may be difficult to
ascertain due to possible lack of observable affect and verbal expression, but his behaviors demonstrate that the most readily available response for the child is to strike back.

Long term exposure to violent media influences children at the distal level by contributing to children’s overall environmental experiences, leading children to perceive aggression as normal and as an acceptable means of problem solving; in other words, they become desensitized to the real meaning and impact of violence (Bushman & Anderson, 2009; Bushman & Anderson, 2001; Funk et al., 2004). In the process of desensitization, the viewer finds violent behaviors increasingly acceptable and does not experience the reactions violent behaviors would normally provoke. It is difficult to conceptualize how desensitization may operate on children with ASD. There is evidence that, when children with ASD are engaging in social interaction, the observable behaviors they demonstrate suggest they treat other human beings as somewhat object-like (Gomez et al., 1995), so in some ways they may be born less sensitized to others’ pain. There is some evidence that children with ASD can accurately process the facial expressions of animated characters using the same strategy that typically developing children use to process all faces, but they process the facial expressions of live action characters differently (Rosset et al., 2008). This suggests that children with ASD require more effort to process real human faces and may use different regions of the brain than typically developing children. An investigation of eye-tracking in children with ASD provided evidence that these children spend very little time gazing at faces on a screen whether the characters are live action or animated (Riby & Hancock, 2009). They instead focus on the bodies of the characters or the backgrounds of the media they are watching.
This could indicate that children with ASD are generally somewhat less sensitive than typical children to the distress of characters in the media they consume, especially in the case of live action characters.

When researchers examine electrodermal responses and not only observable behavior, there is further evidence that children with ASD do react to distress cues. Blair (1999) compared the psychophysiological responses of 20 children with autistic disorder (ages 9 to 15 years), 20 children with a moderate learning disability (ages 10 to 12), and 20 typically developing children (ages 6 to 7) by measuring their electrodermal responses in reaction to three types of picture stimuli: threatening (e.g., a pointed gun), distressed (e.g., a crying face), and neutral (e.g., a hairdryer). The results indicated no statistically significant differences between the children with ASD and the other two groups for the distressing stimuli, indicating that although they may not know how to demonstrate empathy appropriately, they experience some physiological indicators of empathy similar to their neurotypical peers.

Another notable finding from this study was that children with ASD were under-responsive to threatening stimuli compared with children from the other two groups. This may mean children with ASD are not as physiologically aroused by threatening images that are not accompanied by context or other sensory input as other children are. For example, viewing a still image of a weapon does not impact them, likely because it is not being held by a threatening person who is moving around and yelling. It is not surprising, based on their impaired theory of mind and literal cognitive styles that they do not perceive threat in an inanimate object (e.g., “that gun is just sitting on a table untouched, so it can’t possibly hurt me while in that state.”). Neurotypical children may
have violent schemas activated by viewing a still image of a gun because they have been taught repeatedly over time that guns are powerful and dangerous, and that when “bad guys” have guns, they likely intend to harm. This also relates to the notion that children with ASD have difficulty connecting aggressive actions to harm in a victim. Although further research is needed, these findings suggest that children with ASD may have some awareness of the distress of others based on typical electrodermal responses to distress cues and they may have the potential to become desensitized to it through repeated exposure to violent media. At the same time, they are not sensitized to threatening stimuli out of context, and may have difficulty understanding the cause of a character’s distress.

**The Present Study**

The emerging bodies of research regarding ASD and problem behaviors, effects of violent media on children, and media consumption of children with ASD strongly suggest research is needed that combines consideration of all these areas. The present study addressed one primary research question: Are there differences in the behaviors of children with ASD while viewing a cartoon with violent themes, compared with the same child’s behavior during a prior period of unstructured free play? Behaviors during cartoon viewing are important to examine because of studies indicating that children with ASD may be imitating media while they view it (Shane & Albert, 2008). Additionally, application of the GAM (Anderson et al., 2012) in children with ASD suggests that behavioral cues are the best approximation of the activation of aggressive cognitions and emotions, partly due to these children’s verbal delays and lack of insight. If cartoons with violent themes are activating such cognitions and emotions in children with ASD,
there are likely to be immediate observable behavioral cues. This is because these children tend to have a present time orientation and are focused on moment to moment stimuli. Immediate imitation may also have important implications for later behavior.

**Hypotheses.**

Hypothesis One. Participants will demonstrate more observable aggressive behaviors while viewing a cartoon with violent themes than during a prior period of unstructured free play.

Hypothesis Two. Participants will demonstrate more observable behaviors overall (indicating increased physiological arousal) while viewing a cartoon with violent themes than during a period of unstructured free play.

Hypothesis Three. There will be a negative relationship between length of services participants have received and total observable aggressive behaviors (for both free play and for cartoon viewing conditions).

**Exploratory questions.**

1) What types of verbal and non-verbal reactions do children with ASD have to cartoons with aggressive themes?

2) What types of challenging behaviors do children with ASD have that are not included in the behavior observation schedule or are demonstrated outside of the two experimental conditions?
Chapter 3

Method

Recruitment

Recruitment involved three steps: 1) conducting a brief meeting with program administrators from two schools to discuss the study and obtain permission to contact teachers, 2) providing classroom teachers with handouts explaining the study in detail and what was being requested of them, and 3) providing parents with handouts and consent forms.

Participants

Participants were drawn from two different schools in a Midwestern city that exclusively serve children with ASD and each will be described separately. A power analysis (Cohen, 1992) determined that approximately 28 participants were needed to detect a significant difference when the following criteria are set: alpha is equal to .05, the ability to detect differences in the population of interest when differences actually exist is 80%, and the estimated medium effect size in the population is Cohen’s $d = .50$. The medium effect size estimate is based on reports of behavioral effects of media on typically developing samples of children, adolescents, and college students (Anderson et al., 2010; Anderson et al., 2007; Bushman & Anderson, 2009; Engelhardt et al., 2011; Kirsh, 2006).

Setting One. The first setting from which participants were recruited was a public school that exclusively serves children with an autism spectrum disorder and has approximately 100 students, who range in age from 5 to 21 years. The school is highly structured and makes use of empirically supported strategies for effective teaching of
children on the autism spectrum, such as ABA and Handwriting Without Tears, which is a multisensory, widely-adopted handwriting curriculum. The classrooms were divided primarily by level of functioning, which appeared to be related to the children’s specific autism spectrum disorder. For example, one classroom contained only adolescents with Asperger’s Disorder while another appeared to contain only lower functioning children with Autistic Disorder. Although all students shared the commonality of being diagnosed with an autism spectrum disorder, there was a great deal of heterogeneity between classrooms as well as between individual participants in terms of level of functioning: some children were extremely verbal but unable to understand social cues, some were extremely withdrawn and isolated, some acted out aggressively, some acted out sexually, some had comorbid disorders common to this diagnostic spectrum (e.g., mental retardation), and some had unique comorbid disorders (e.g., Chiari malformation). There were several participants from nearly all of the classrooms.

**Participants from Setting One.** Participants from Setting One were 32 children who had been formally diagnosed as having an ASD (i.e., autistic disorder, Asperger’s disorder, or PDD-NOS) and who were attending a school or program limited to this population. In the majority of cases, diagnoses were made by a qualified professional prior to being accepted at the school, and diagnoses were again confirmed through their educational multi-disciplinary team, (which typically included a school psychologist, behavior intervention specialist, and speech language pathologist). This means the participation rate was approximately 32%, which is typical for a study involving media use in children with ASD (Shane & Albert, 2008). Information about each participant was gathered by the researcher, who conducted a thorough review of the academic
records using the Student Record form (see Appendix D). The sample was 75% male and 25% female, which is similar to the three to one ratio found in epidemiological studies on ASD (American Psychiatric Association, 2013; American Psychiatric Association, 2000). The ethnicity of the sample was 69% European American, 22% African American, 3% Hispanic, 3% Asian/Pacific Islander, and 3% Middle Eastern American and was representative of demographic information from the region where the study took place, which estimates that the population is composed of 70% Caucasian, 23% African American, 2.5% Hispanic, 1% Asian/Pacific Islander, 1% Middle Eastern American, and 2.5% Mixed Race individuals (“City of Toledo,” 2000). The age range of participants was from middle childhood to late adolescence (7 years to 19 years, $M = 12.5$ $SD = 3.84$). The majority of the sample was diagnosed with autistic disorder (72%), with PDD, NOS (16%) and Asperger’s (13%) composing a smaller proportion of the sample. Roughly 18% of the sample did have a comorbid diagnosis, but the majority of the sample did not (66%); it was unknown whether 16% of the sample did or did not have a formally diagnosed comorbid disorder because the information was not indicated in their records.

**Setting Two.** The second setting from which participants were recruited was a local public school that exclusively serves children with an autism spectrum disorder and has approximately 65 students, who range in age from 7 to 23 years. The school was moderately structured. The classrooms were divided primarily by age. Students in this setting appeared to have more severe symptoms than participants from Setting One, especially aggressive symptoms and a lower level of general functioning. Three participants demonstrated aggressive behaviors to the point that they could not safely participate in the cartoon viewing condition. There were several participants from nearly
all of the classrooms.

**Participants from Setting Two.** Participants from the second setting were 10 children who had been formally diagnosed as having an ASD (i.e., autistic disorder, Asperger’s disorder, or PDD-NOS) and who were attending a school or program limited to this population. In the majority of cases, diagnoses were made by a qualified professional prior to being accepted at the school, and diagnoses were again confirmed through their educational multidisciplinary team, (which typically included a school psychologist, behavior intervention specialist, and speech language pathologist). This means the response rate was approximately 15%, which is somewhat low for a study involving media use in children with ASD (Shane and Albert, 2008). Information about each participant was gathered by the researcher, who conducted a thorough review of the academic records using the Student Record form (see Appendix D). The sample was 80% male and 20% female, with there being more males than females compared to the three to one male to female ratio found in epidemiological studies on ASD (American Psychiatric Association, 2013; American Psychiatric Association, 2000). The ethnicity of the sample was 50% European American and 50% African American, and was not completely representative of demographic information from the region where the study took place, which estimates that the population is composed of 70% Caucasian, 23% African American, 2.5% Hispanic, 1% Asian/Pacific Islander, 1% Middle Eastern American, and 2.5% Mixed Race individuals (“City of Toledo,” 2000). The age range of participants was from middle childhood to late adolescence (7 years to 23 years, $M = 15.6$ $SD = 4.53$). The entire sample from this setting was diagnosed with autistic disorder (100%) and had a comorbid diagnosis (primarily mental retardation).
Coder Training

Two professional community members (a retired psychologist and a retired engineer) were selected and trained to code participants in each of the two conditions (free play and cartoon viewing). Training involved three steps: 1) gaining familiarity with the structure and items of the behavior observation schedule, the ASD-BC, (including clarification of the operational definitions for each item and when to rate consecutive behaviors as one versus two or more occurrences); 2) practicing coding by watching a 15 minute video segment of a family with six children all on the autism spectrum; 3) ensuring an interrater reliability of over 80% by having the coders simultaneously code the first four participants in the study and then running intraclass correlations to verify acceptable reliability.

Measures

Record Review. The school records of each participant were carefully reviewed to gather data on age, date of birth, sex, ethnicity, diagnoses, (and in many cases, what professional or team of professionals made the diagnoses), and length and type of services received (see Appendix D).

Autism Spectrum Disorders – Behavioral Checklist. The primary dependent measure used was the Autism Spectrum Disorder – Behavior Checklist (ASD-BC; see Appendix E), which was developed by the researcher based on observable behaviors adapted from items on the following scales: The Children's Scale of Hostility and Aggression: Reactive/Proactive (C-SHARP; Farmer & Aman, 2009), the Nisonger Child Behavior Rating Form (NCBRF; Aman et al., 1996), Autism Spectrum Disorders-Problem Behaviors for Children (ASD-PBC; Matson, Mahan, Hess, Fodstad, & Nealand,
and a measure of stereotypic behavior (Willemsen-Swinkels, Buitelaar, Dekker, & van Engeland, 1998). Examples of items that were adapted from the C-SHARP are ‘throws object” and “bites others.” Examples of items adapted from the ASD-PBC include “kicks object” and “spits.” Examples of items adapted from Willemsen-Swinkel et al.’s (1998) measure of stereotypic behaviors are “flaps hands” and “rocks back and forth.” A new measure was created because none of the existing measures were intended for use as a behavior observation scale, and therefore did not contain simple, objective, and observable behaviors that could be coded item by item. In addition, the existing measures were intended to assess severe challenging behaviors exclusively. Using these specific measures alone might have indicated the hypotheses of the study to the coders, potentially biasing their observations. See Table X for a comparison of item content between the ASD-BC and the four measures above.

Table 1

Comparison of ASD-BC Item Content and Related Measures

<table>
<thead>
<tr>
<th>ASD-BC</th>
<th>C-SHARP</th>
<th>Nisonger CBRF</th>
<th>ASD-PBC</th>
<th>Stereotypies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blinks repeatedly</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Sensory, low intensity</td>
</tr>
<tr>
<td>Cries/Frowns</td>
<td>Crying</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Grimaces/Winces</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Opens mouth</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Scowls/Angry face</td>
<td>Sneers, makes faces</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
Table 1 continued

<table>
<thead>
<tr>
<th>ASD-BC</th>
<th>C-SHARP</th>
<th>Nisonger CBRF</th>
<th>ASD-PBC</th>
<th>Stereotypies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smiles</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Stares</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Sensory, low intensity</td>
</tr>
<tr>
<td>Sticks out tongue</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Breaks object</td>
<td></td>
<td>Breaks own/others’ belongings</td>
<td>Destroys property</td>
<td>Property destruction</td>
</tr>
<tr>
<td>Bites object/person</td>
<td>Bites others</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hits or shoves forcefully</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Hits object/person</td>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Kicks object/person</td>
<td>–</td>
<td>–</td>
<td>Kicking object</td>
<td>–</td>
</tr>
<tr>
<td>Spits</td>
<td></td>
<td>Spits at others</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Throws object</td>
<td></td>
<td>Throws object</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Bangs head</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Sensory, high intensity</td>
</tr>
<tr>
<td>Climbs on something</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Flaps hands</td>
<td>–</td>
<td>Flaps objects</td>
<td>–</td>
<td>Movement limb</td>
</tr>
<tr>
<td>Jumps/Bounces</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Movement trunk</td>
</tr>
<tr>
<td>Rocks back &amp; forth</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Movement trunk</td>
</tr>
</tbody>
</table>
Table 1 continued

<table>
<thead>
<tr>
<th>ASD-BC</th>
<th>C-SHARP</th>
<th>Nisonger CBRF</th>
<th>ASD-PBC</th>
<th>Stereotypies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runs around</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Sits down (1x)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Spins</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Movement trunk</td>
</tr>
<tr>
<td>Sniffs object/person</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Sensory, low intensity</td>
</tr>
<tr>
<td>Stands up (1x)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Bites self</td>
<td>–</td>
<td>Bites self</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Hits self with hand</td>
<td>–</td>
<td>Hits self</td>
<td>Harming self by hitting</td>
<td>Sensory, high intensity</td>
</tr>
<tr>
<td>Hits self with object</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Pinches self</td>
<td>Pinches others</td>
<td>–</td>
<td>Harming self by pinching</td>
<td>–</td>
</tr>
<tr>
<td>Pulls hair</td>
<td>Pulls others’ hair</td>
<td>–</td>
<td>Pulling others’ hair</td>
<td>–</td>
</tr>
<tr>
<td>Scratches self</td>
<td>Scratches others</td>
<td>–</td>
<td>Harming self by scratching</td>
<td>–</td>
</tr>
<tr>
<td>Grunts</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Says words</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Says non-words</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Sings</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Squeals</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Unusual vocalizations</td>
</tr>
</tbody>
</table>
Table 1 continued

<table>
<thead>
<tr>
<th>ASD-BC</th>
<th>C-SHARP</th>
<th>Nisonger CBRF</th>
<th>ASD-PBC</th>
<th>Stereotypies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screams</td>
<td>Shouts at others</td>
<td>–</td>
<td>Yelling or shouting</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Uses profanity</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Swears</td>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Whistles</td>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

The ASD-BC is a 38-item behavior observation schedule containing objective, observable behaviors common to children with ASD. Each item on this measure is related to external, observable manifestations of some degree of internal physiological arousal and potential reaction to stimuli. Items not directly related to aggression also served to deter coders from ascertaining the researcher’s hypotheses, as awareness of hypotheses could have influenced and biased coder’s perceptions. The ASD-BC contains five categories of behavior: Affective (8 items), Aggression Towards Others (6 items), Body Movements (10 items), Aggression Towards Self (6 items), and Verbal (8 items). Examples of items from each category respectively are “opens mouth,” “hits object or person,” flaps hand(s),” “bites self,” and “grunts.” These five categories address the primary domains of observable behaviors children with ASD can demonstrate (i.e., affective, gross motor, verbal, self-harming, and challenging behaviors), and are intended to provide insight into their internal levels of physiological arousal in response to free play activities and cartoon viewing.

Coders observed participants in one-minute intervals and checked the
corresponding box each time they observed a behavior included on the ASD-BC. They would flip to a new ASD-BC sheet after being signaled by the researcher that one minute had passed until 10 minutes of observation were complete or until the participant self-terminated his/her participation (e.g., leaving the observation area, stopping the cartoon in the cartoon viewing condition). The time sampling procedure was used primarily to maintain organization and assure that coders were coding the exact same portion of the cartoon for each participant. The level of violence in the cartoon clip remained fairly consistent throughout the ten minute observation period, making it reasonable to compute summary scores rather than analyze data on a minute by minute basis. Two types of summary scores were calculated: one for all items on the ASD-BC and one for aggressive items only. The ASD-BC contains 18 aggressive items, as follows: Items 2, 3, 5, 9, 10, 11, 12, 13, 14, 15, 25, 26, 27, 28, 29, 30, 36, and 37 (see Appendix E).

**Qualitative Observations.** Additional observations of each participant were made by the researcher to capture qualitative data not accounted for by the ASD-BC. These include attention to the cartoon during cartoon viewing, as well as sexual and aggressive behaviors that, in some cases, required observations to be terminated early. Follow-up questions were asked of participants whose verbal comprehension permitted. These questions were “What did you think of the cartoon?” “Have you ever seen this cartoon before?” and “What is your favorite television show or movie?” (see Appendices D and F). Some participants volunteered this information without being asked (e.g., “I’ve seen this before!”)

**Procedure**

Classroom teachers in both settings provided all parents with a copy of the
consent form (see Appendix C) in their children’s homework folders. The researcher scheduled times with school personnel to review records of children whose guardians consented for them to participate. Data on age, date of birth, ethnicity, diagnosis, length and types of services were collected during several visits to each of the two schools. The researcher interacted informally with students during these regular visits to review records, and students gained some degree of familiarity with the researcher. This allowed participants to develop familiarity with the researcher prior to experimental sessions. Afterwards, thirty minute visits were scheduled individually for each child for whom consent was obtained.

One set of 10 copies of the ASD-BC was used by a research assistant to observe each participant in one minute intervals for a total of 10 minutes in his/her classroom or at the playground at school during free play or recess. Participants were observed one at a time for 10 minutes of free play while one of two trained research assistants recorded all behaviors observed on the ASD-BC. Teachers instructed each participant to play whatever s/he would like for 10 minutes, while classmates continued whatever activity they were engaged in (i.e., there was not a group free play). Every effort was made to standardize the free play environment, although the setting varied slightly. Most classrooms included similar layouts, with a teacher’s desk at the front of the classroom, assigned tables and chairs for each student in the center of the room, and different activity stations around the edges of the classroom. Typical colorful, educational decorations were on the walls. Nearly all classrooms had at least one computer in the room. Only one student had his free play outside on the playground. Children’s chosen free play activities ranged from running back and forth across the room to browsing on the
computer; however, most children preferred to engage with media during free play. All participants were around classmates and/or teachers during free play.

At the end of the 10 minute free play observation, the researcher explained to the participant that s/he would be brought to a quiet space to watch a cartoon clip. Visiting the library daily to check out books and get computer time was a common occurrence for participants, and was not a major deviation from their routine. Peers and teachers came in and out of the library or quiet room used during the cartoon viewing, but they did not interact with or otherwise distract the participants. Participants watched a 10 minute cartoon battle scene from the cartoon *Dragon Ball Z Kai* while the same coder from the free play condition observed and recorded the participant’s behaviors on the ASD-BC. *Dragon Ball Z Kai* is an animated children’s television series that features the use of martial arts to defeat villains as the protagonist travels Japan. It is rated TV-Y7; this means it is considered acceptable for viewing by children ages 7 years and older, according to the Electronic Screen Media Review Board (ESMRB). The scene selected for viewing was characteristic and included hand to hand combat with blood. Despite its TV-Y7 rating, this cartoon is described as “very violent” and is rated 3 out of 5 possible points for violence and scariness by Common Sense Media (2014), a reputable website designed to help parents make decisions about their children’s media consumption. The level of violence in the cartoon selected for the study was likely great enough that it would be expected to impact most children who attend to it.

Any behaviors not included on the ASD-BC were documented by the researcher during the two observation sessions and outside of observation sessions when available. The researcher asked each participant 1) what s/her thought of the cartoon, 2) whether
s/he had seen the cartoon before, and 3) what is his/her favorite television show or movie
(see Appendix F). Non-verbal students did not respond, and this information was
requested from those students’ teachers, if the teachers were aware of the information.
Participants were then thanked and given a small toy of their choice, such as small stuffed
animals, squishy stress balls, or other safe, non-disruptive toys.
Chapter 4

Results

This study used a mixed-method design. To examine the quantitative research questions, a within subjects, repeated measures design was used to examine potential differences between the behaviors of children with ASD during a period of free play and during cartoon viewing. The independent variable was type of activity, with two levels (free play and cartoon viewing). The primary dependent variables were the total aggressive behaviors score and the total composite behaviors score on the ASD-BC (see Appendix E). To examine qualitative findings, the study also used a collective case study design: behaviors not captured during the two experimental conditions or not captured by the ASD-BC (see Appendices D and F) were analyzed.

Preliminary Analyses

Interrater Reliability. Because the ASD-BC was constructed by the researcher based on observable physical and verbal behaviors selected from established measures, inter-rater reliability analyses were conducted to assure that both research assistants (i.e., coders) were using the measure consistently. Intraclass correlation coefficients (CI = 90%) were computed for observations made by both coders for the first four participants during the free play and the cartoon viewing conditions. Disagreements were resolved through discussion (e.g., there must be a full one second pause between the same behavior for that behavior to be counted twice). Based on observations of the first four participants in the sample made during the free play condition, the two coders’ ratings yielded a Cronbach’s alpha coefficient of .85. Based on observations of the first four participants in the sample made during the cartoon condition, the two coders’ ratings also yielded a Cronbach’s alpha coefficient of .85. Both of these alpha coefficients indicate
that the trained coders demonstrated acceptable inter-rater reliability on the ASD-BC. Internal consistency was also measured for the free play condition (Cronbach’s alpha coefficient of .87) and for the cartoon viewing condition (Cronbach’s alpha coefficient of .90). This suggests that, as a group, items on the ASD-BC are measuring the same construct.

Primary Analyses

Quantitative Data.

Exploratory Analyses. Exploratory analyses (i.e., frequencies, measures of central tendency, and boxplots) were done to ensure that the data were appropriate for repeated measures $t$-tests. The distributions met the requirements for these comparisons. Total scores for each participant were computed by summing the quantity of all behaviors observed during the ten minute observation periods for both the free play and the cartoon viewing conditions. Mean scores were then calculated for aggressive behaviors observed during the ten minute observation for each of the two conditions on the ASD-BC. Mean scores were also calculated for total behaviors observed during the ten minute observation for each of the two conditions on the ASD-BC. For 10 of the 42 cases, there were insufficient data (due to participants terminating their participation) to calculate totals of aggressive behaviors observed or totals of all behaviors observed, thus 32 cases were used to in relevant analyses.

The possible range for total behaviors on the ASD-BC during a 10 minute observation period was 0 (e.g., if participants demonstrated absolutely none of the behaviors on the ASD-BC) to an almost limitless number (e.g., if participants demonstrated all 38 behaviors multiple times for all 10 minutes of the observation period).
periods). Although it was not anticipated that any participant would exhibit all 38 behaviors on the ASD-BC every minute during the 10 minute observation periods, the actual range was for the free play condition was only 0 to 67, (excluding one outlier, who appeared to demonstrate 130 behaviors mainly because he demonstrated one behavior repetitively with at least one second pauses in between for 10 minutes). The range for total behaviors in the cartoon viewing condition was 0 to 85. The range for aggressive behaviors only in the free play condition was 0 to 28 and the range in the cartoon condition was 0 to 16. These restricted ranges suggest that children in the sample demonstrated relatively few behaviors listed on the ASD-BC (or any other behaviors) during the 10 minute observation periods. However, during the free play condition ($n = 42$), a total of 12 children demonstrated no aggressive behaviors, while 30 demonstrated at least one or more aggressive behaviors (71%). During the cartoon viewing condition ($n = 32$), a total of 7 children demonstrated no aggressive behaviors, while 25 demonstrated at least one or more behaviors (78%). Although about three-quarters of the children demonstrated one or more aggressive behaviors on the ASD-BC during the two conditions, the total frequency of aggressive behaviors was low.

To examine item level totals across conditions, summary scores for each participants’ behaviors during the 10 minute observations for each of the two conditions were calculated (see Table 2). The four most common behaviors during the free play condition were “says words” = 422, “says non-words” = 206, “smiles” = 197, and “flaps hands” = 117. In the free play condition, the lowest frequency behaviors (with a code of 0, meaning no participants exhibited these during observations of the free play conditions) included many self-aggression and verbal aggression items: “hits self with
object,” “pinches self,” “pulls own hair,” “screams,” and “swears.” In the cartoon viewing condition, the four most common behaviors included “says words” = 195, “says non-words” = 180, and “smiles” = 119, but with less frequency than in the free play condition. Instead of “flaps hands” (as in the free play condition), the fourth most common behavior in the cartoon viewing condition was “stares” = 135. The most common behavior was staring away from the computer screen where the cartoon was playing. The lowest frequency behaviors in the cartoon viewing condition (with a code of 0, meaning no participants exhibited these during observations of the cartoon viewing conditions) included “hits self with object,” “pinches self,” and “swears,” as well as “kicks person/object,” “spits,” “spins,” and “bangs head.”

Table 2

*Item Level Summary Scores on the ASD-BC for Free Play and Cartoon Viewing Conditions*

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Description</th>
<th>Free Play Total</th>
<th>Cartoon Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blinks repeatedly</td>
<td>8</td>
<td>31</td>
</tr>
<tr>
<td>2</td>
<td>Cries/Frowns</td>
<td>18</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>Grimaces/Wincses</td>
<td>29</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>Opens mouth</td>
<td>32</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>Scowls/Angry face</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>Smiles</td>
<td>197</td>
<td>119</td>
</tr>
<tr>
<td>7</td>
<td>Stares</td>
<td>65</td>
<td>135</td>
</tr>
<tr>
<td>8</td>
<td>Sticks out tongue</td>
<td>35</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>Breaks object</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>Bites object/person</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 2 continued

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Description</th>
<th>Free Play Total</th>
<th>Cartoon Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Hits object/person</td>
<td>46</td>
<td>41</td>
</tr>
<tr>
<td>12</td>
<td>Kicks object/person</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>Spits</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Throws object</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>Bangs head</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>Climbs on something</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>Flaps hands</td>
<td>117</td>
<td>22</td>
</tr>
<tr>
<td>18</td>
<td>Jumps/Bounces</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>19</td>
<td>Rocks back &amp; forth</td>
<td>44</td>
<td>32</td>
</tr>
<tr>
<td>20</td>
<td>Runs around</td>
<td>47</td>
<td>7</td>
</tr>
<tr>
<td>21</td>
<td>Sits down (1x)</td>
<td>51</td>
<td>19</td>
</tr>
<tr>
<td>22</td>
<td>Spins</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>23</td>
<td>Sniffs object/person</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>24</td>
<td>Stands up (1x)</td>
<td>42</td>
<td>21</td>
</tr>
<tr>
<td>25</td>
<td>Bites self</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26</td>
<td>Hits self with hand</td>
<td>25</td>
<td>9</td>
</tr>
<tr>
<td>17</td>
<td>Hits self with object</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18</td>
<td>Pinches self</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>Pulls own hair</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td>Scratches self</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>31</td>
<td>Grunts</td>
<td>36</td>
<td>24</td>
</tr>
<tr>
<td>32</td>
<td>Says words</td>
<td>422</td>
<td>195</td>
</tr>
<tr>
<td>33</td>
<td>Says non-words</td>
<td>206</td>
<td>180</td>
</tr>
<tr>
<td>34</td>
<td>Sings</td>
<td>12</td>
<td>18</td>
</tr>
</tbody>
</table>
Table 2 continued

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item Description</th>
<th>Free Play Total</th>
<th>Cartoon Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>Squeals</td>
<td>41</td>
<td>46</td>
</tr>
<tr>
<td>36</td>
<td>Screams</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>37</td>
<td>Swears</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>38</td>
<td>Whistles</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Regarding sample means, the mean total for all behaviors observed on the ASD-BC was 36.69 (SD = 24.91) in the free play condition and 28.63 (SD = 23.19) in the cartoon condition. See Figure 1 below. The mean total for aggressive behaviors only observed on the ASD-BC was 3.74 (SD = 5.67) in the free play condition and 3.38 (SD = 3.82) in the cartoon condition.

Figure 1. Sample Means for ASD-BC and ASD-BC Aggressive Only Totals by Condition
Differences Between Means for Free Play and Cartoon Viewing on the ASD-BC.

To examine the repeated measures results for the control and experimental conditions, two paired samples t-tests were conducted. The first included means from the total of aggressive behaviors only and the second included means from the total of all behaviors on the ASD-BC. Neither of these tests yielded statistically significant results: Aggressive Behaviors Only \( t(32) = -.791, p = .435 \); All Behaviors \( t(32) = .777, p = .443 \). This indicates that, based on this sample, there were not statistically significant differences between participants’ observable aggressive behaviors during a prior period of free play versus a subsequent period of watching a cartoon with violent themes. Additionally, there were not statistically significant differences between participants’ total observable behaviors during a period of free play versus a period of watching a cartoon with violent themes. The effect size for Aggressive Behaviors Only (Cohen’s \( d = .18 \)) and the effect size for All Behaviors (Cohen’s \( d = .16 \)) were both small, indicating that the amount of variance in the dependent variable (behaviors on the ASD-BC) accounted for by the independent variable (type of condition, free play or cartoon viewing) is less than 1% and is not very meaningful. Possible analyses for comparing item level totals were considered, but the number of empty or low frequency cells and the sizable standard deviation predicted for such calculations limited their value. There are three items in particular that could warrant further exploration due to their large differences between the free play condition and the cartoon viewing condition. These are: stares (65 occurrences during free play and 135 during cartoon viewing), suggesting that participants may stare more often during the cartoon than during free play; flaps hands (117 during free play and 22 during the cartoon viewing); and says words (422
during free play and 195 during cartoon viewing), suggesting that participants flapped their hands and said discernible words more often during free play than during the cartoon.

**Correlations Between Major Study Variables.** Chi-square tests of independence were performed to examine the relationships between sex, ethnicity, and diagnoses with aggressive behaviors on the ASD-BC during free play and during cartoon viewing. In order to examine total aggressive behaviors in this way, recoded nominal level variables were used to create two categories (no aggressive behaviors and one or more aggressive behaviors). The relationships between total aggressive behaviors during free play and participants’ diagnoses was significant,  \( \chi^2 (2, N = 38) = 6.95, p = .031 \). Children diagnosed with autistic disorder demonstrated more aggressive behaviors during free play than those with Asperger’s disorder and pervasive developmental disorder, not otherwise specified. The relationship between total aggressive behaviors during free play and sex,  \( \chi^2 (1, N = 38) = 3.14, p = .076 \), approached statistical significance, with males demonstrating more aggressive behaviors than females. The relationships between total aggressive behaviors during free play and ethnicity,  \( \chi^2 (3, N = 38) = 4.95, p = .175 \) and school,  \( \chi^2 (1, N = 38) = 1.71, p = .191 \), were non-significant. The relationships between total aggressive behaviors during cartoon viewing and sex,  \( \chi^2 (1, N = 28) = 2.67, p = .102 \), ethnicity,  \( \chi^2 (3, N = 28) = 3.78, p = .286 \), diagnosis,  \( \chi^2 (1, N = 28) = .98, p = .613 \), and school,  \( \chi^2 (1, N = 28) = 1.12, p = .290 \), were also non-significant. See Table 3.
Table 3

Pearson Chi Square Relationships Between Major Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Free Play</th>
<th>Cartoon Viewing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sex</td>
<td>3.14**</td>
<td>2.67</td>
</tr>
<tr>
<td>2. Ethnicity</td>
<td>4.95</td>
<td>3.78</td>
</tr>
<tr>
<td>3. Diagnosis</td>
<td>6.95*</td>
<td>.98</td>
</tr>
<tr>
<td>4. School Attended</td>
<td>1.71</td>
<td>1.12</td>
</tr>
</tbody>
</table>

* p < .05.
** p < .08.

Transformations were used to generate proportions for each participant based on chronological age and length of time in years s/he had received specialized services to address ASD symptoms, such as speech therapy. These were computed by dividing years spent receiving services by chronological age to obtain a proportion of each participant’s life spent receiving services. Pearson’s r was used to examine correlations between length of services and total aggressive behaviors in both conditions. No statistically significant relationships were found: Aggressive Behaviors in Free Play by Length of Service, $r = -.05$, p = .38; Aggressive Behaviors in Cartoon Viewing by Length of Service, $r = .14$, p = .23. Because there were statistically significant differences between aggressive behaviors during free play by diagnosis (where children with autistic disorder exhibited more than children with Asperger’s disorder and PDD-NOS), correlations between aggressive behaviors and length of services for only children with autistic disorder were examined. However, no statistically significant relationships were found: Aggressive Behaviors in Free Play by Length of Service, $r = -.21$, p = .24; Aggressive Behaviors in Cartoon Viewing by Length of Service, $r = -.05$, p = .82.
**Behavioral differences between schools.** Although results were not statistically significant as reported above, participants from the second setting, who were all cognitively and behaviorally lower functioning, tended to demonstrate more overall behaviors and aggressive behaviors more consistently than participants in the first setting. This was true for structured observations made on the ASD-BC (68% or 21 out of 31 demonstrated one or more aggressive behavior in the first school whereas 90% or 9 out of 10 participants demonstrated one or more aggressive behaviors in the second school). This was also true for additional observations made outside of the free play and cartoon viewing conditions. Two participants from the second setting were so aggressive that the researcher and coder could not remain in the room with them to complete the cartoon condition. Some of these aggressive behaviors included grabbing the researcher’s wrist so hard it bruised. Other aggressive behaviors included hitting, kicking, and spitting, and occurred during extreme tantrums that required visits to an empty “safe” room.

**Qualitative Data**

**Thematic Coding Analysis.** To examine the contiguity relations, or connections, between participants’ verbal/non-verbal reactions and the cartoon viewing condition not captured by the ASD-BC, Thematic Coding Analysis was used (Robson, 2011). The phases of the Thematic Coding Analysis included 1) repeated examination of all qualitative data, 2) identification of relevant codes (i.e., descriptive labels for types of data that appear connected), 3) collating codes into identified themes, 4) constructing a map of thematic networks (see Figure 2), and 5) describing and interpreting the patterns based on the current literature. Data were obtained from researcher observations during the two conditions; while the coder(s) made their observations on the ASD-BC for
qualitative analysis, the researcher made additional observations on the forms included in Appendix D (Information Gathered from Student Records and During Observation) and Appendix F (Follow-up Questions). The researcher also documented aggressive behaviors exhibited by participants outside of the two conditions (e.g., when a participant pulled the researcher’s hair while a different participant was being observed by the coder). Data was organized in Microsoft Excel and then examined using Thematic Coding Analysis.

Reactions to Cartoons. For participants’ nonverbal reactions, one primary theme emerged: Attending to Stimuli. Attending to Stimuli contained secondary themes, Attended or Avoided. The participants’ non-verbal reactions to the cartoon viewing appeared dichotomous; nearly all participants either sat quietly and very attentively in an almost robotic fashion (Attended) or became agitated and then disengaged from the cartoon visually and/or aurally. Visual Avoidance yielded three codes: Stopped Video (participants manually stopped the video), Looked Away (participants looked away from the screen or closed their eyes), and Left Chair (participants physically left the area). Twenty-one participants engaged in visual avoidance (2 stopped the video, 11 looked away from the screen, and 7 left the area). Seventeen participants engaged in Auditory Avoidance (9 covered their ears, 2 turned down the volume, and 6 removed their headphones). These totals exceed the total number of participants in the cartoon viewing condition because the behaviors of some participants were coded more than once (e.g., some looked away from the screen and covered their ears). Only 11 participants attended fully to the cartoon based on their observable non-verbal behaviors. These findings are graphically displayed in Figure 2.
To examine the contiguity relations, or connections, between participants’ verbal reactions and the cartoon viewing, Thematic Coding Analysis was also used. During or immediately after the cartoon viewing, 7 of the participants made a total of 17 unprompted and prompted statements about the cartoon. Two themes emerged: Emotional Valence and Attending to Stimuli. Emotional Valence yielded two codes: Negative (e.g., scared) and Positive (e.g., thrilled). Under the theme of Emotional Valence, 12 statements were coded as Negative because they involved expressions and tones of fear or discomfort (e.g., “This is scary.”). Four were coded as Positive because they involved expressions and tones of excitement or thrill (e.g., “Wow, look at that guy transform!”).

Attending to Stimuli also yielded two codes: Violent (the participant’s comment referenced a violent scene) and Neutral (the participant’s comment referenced a neutral scene). Almost all (9) of these statements pertained to the violent nature of the scenes (e.g., “He’s kicking that bad guy.”) and only 2 pertained to a more neutral scenes (e.g., “I see da pink bubbles.”), although it should be noted that roughly 9 minutes of the 10 minute cartoon clip contained aggressive themes (see Figure 2).
Figure 2. Thematic Coding Analysis of Participants’ Reactions to Cartoon Viewing

Figure 2. Total n of participants whose reactions were analyzed = 42
Numbers on figure indicate n of those who demonstrated each particular reaction.
These comments are further detailed below (see Table 4), including the gender and age of the participant.

Table 4

**Verbal Comments on Cartoon**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>8</td>
<td>&quot;Wow, look at that guy transform. He's kicking that bad guy.&quot;</td>
</tr>
<tr>
<td>Male</td>
<td>9</td>
<td>&quot;Oh smash, oh fire. This is a mistake. Oh they got big fire. Watch out! I see da pink bubbles.&quot;</td>
</tr>
<tr>
<td>Female</td>
<td>11</td>
<td>&quot;What's happening? Get the power. Oh no! Do something!&quot;</td>
</tr>
<tr>
<td>Male</td>
<td>13</td>
<td>&quot;This is scary.&quot;</td>
</tr>
<tr>
<td>Male</td>
<td>15</td>
<td>&quot;He's beat up. That's gonna hurt. Oh, almost dead.&quot;</td>
</tr>
<tr>
<td>Female</td>
<td>15</td>
<td>&quot;I don’t like this.&quot;</td>
</tr>
<tr>
<td>Female</td>
<td>19</td>
<td>&quot;This is not appropriate for school.&quot;</td>
</tr>
</tbody>
</table>

*n = 7*

**Other challenging behaviors.** Regarding challenging and aggressive behaviors, Thematic Coding Analysis was used to examine behaviors that occurred and were noted by the researcher but were not captured by the ASD-BC or not captured specifically within the observation period. Three themes emerged: Aggressive, Sexual, and Non-Aggressive (see Figure 3). The first theme, Aggressive, yielded two codes: Pulling Others’ Hair and Lashing Out (this involved hitting or kicking others in a disorganized manner). One participant pulled the researcher’s hair, and five “lashed out” outside of the two experimental conditions. The second theme, Sexual, yielded two codes: Masturbation (e.g., touching own genitals through clothing) and Touching Others
Inappropriately (e.g., attempting to rub genitals on another person or touch another person in private areas). One participant masturbated throughout the entire free play condition and three of the participants attempted to touch others inappropriately. The third theme, Non-Aggressive yielded three codes: Yawning, Shivering, and Belching. Two participants yawned during the cartoon viewing condition (possibly suggesting lack of engagement), one belched repeatedly (seemingly as a stemming/self-soothing behavior), and two shivered (while verbally expressing fear or discomfort). See Figure 3.

Figure 3. Thematic Coding Analysis of Participants’ Challenging Behaviors

<table>
<thead>
<tr>
<th>Aggressive</th>
<th>Sexual</th>
<th>Non-Aggressive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulling Others’ Hair</td>
<td>Lashing Out</td>
<td>Masturbating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Touching Others</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inappropriately</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yawning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Belching</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shivering</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 3. Total n of participants whose challenging behaviors were analyzed = 42
Numbers on figure indicate n of those who demonstrated each particular reaction.

Favorite television shows or movies. In order to learn about participants’ media preferences and estimate whether or not they had regular exposure to violent media, participants were also asked “What is your favorite television show or movie?” Those who were able to comprehend and respond tended to describe television shows rated to be appropriate for their chronological ages by the Federal Communications Commission (FCC) or movies rated to be appropriate for their chronological ages by the Motion
Picture Association of America (MPAA). See Table 5 below.

Table 5

*Favorite Television Shows/Movies and Ratings*

<table>
<thead>
<tr>
<th>Sex/Age</th>
<th>TV Show or Movie</th>
<th>FCC/MPAA Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male/6</td>
<td>All PBS morning shows</td>
<td>TV-Y</td>
</tr>
<tr>
<td>Male/9</td>
<td>Dora the Explorer, Cars</td>
<td>TV-Y, G</td>
</tr>
<tr>
<td>Male/11</td>
<td>Animal planet</td>
<td>Often PG</td>
</tr>
<tr>
<td>Male/12</td>
<td>“Action stuff”</td>
<td>Often PG-13</td>
</tr>
<tr>
<td>Male/13</td>
<td>How to Train Your Dragon</td>
<td>PG</td>
</tr>
<tr>
<td>Male/13</td>
<td>Legendary</td>
<td>PG-13</td>
</tr>
<tr>
<td>Male/14</td>
<td>Dracula</td>
<td>R</td>
</tr>
<tr>
<td>Male/15</td>
<td>Anime (Including Dragon Ball Z)</td>
<td>TV-Y7</td>
</tr>
<tr>
<td>Female/15</td>
<td>Avatar</td>
<td>PG-13</td>
</tr>
<tr>
<td>Male/17</td>
<td>James and the Giant Peach</td>
<td>PG</td>
</tr>
<tr>
<td>Female/18</td>
<td>Black Entertainment Channel</td>
<td>Varies – Often Adult</td>
</tr>
</tbody>
</table>

\( n = 11 \)

*Previous exposure to cartoon.* When asked if they had seen the cartoon before, only three of the children reported familiarity with it. These three children were all male, aged 13 years or older, and highly verbal. They were also among the 11 who attended to the cartoon.

**Summary**

The findings of this mixed method study indicate that as many as three-fourths of the children from this sample demonstrated some aggressive behaviors and other challenging behaviors during an average school day. Aggressive behaviors were found to
be related to children’s diagnoses; lower functioning children with autistic disorder
demonstrated more aggressive behaviors on the ASD-BC than higher functioning
children with Asperger’s and PDD-NOS. Aggressive behaviors were not found to be
related to the proportion of children’s lives spent receiving specialized services like
speech therapy. There was no clear causal relationship between exposure to the cartoon
with violent themes and immediate, observable aggressive behaviors. However, this was
likely impacted by the fact that only 26% of the sample (11 out of 42 participants) fully
attended to the cartoon.
Chapter 5
Discussion

The present study was the first identified to date that examined behaviors of children with an Autism Spectrum Disorder (ASD) using a naturalist approach. Free play behaviors were compared with immediate behavioral reactions to a violent cartoon using a structured behavior observation scale. The primary goal was to determine whether watching a violent cartoon clip caused children with ASD to demonstrate verbal and/or physical aggression towards objects, self, or others, especially aggression that was greater in frequency than the same children demonstrated during a baseline period of free play. Secondary goals were to determine 1) whether watching a violent cartoon clip caused children with an ASD to demonstrate more observable behaviors (suggesting general physiological arousal) than they demonstrated during a period of unstructured free play, and 2) whether there is a negative relationship between length of services children with ASD have received and total observable aggressive behaviors.

In addition to the quantitative comparisons, qualitative data were analyzed using Thematic Coding Analysis (Robson, 2011). Two exploratory questions were examined; the first was to identify patterns of verbal and non-verbal reactions that children with ASD have to cartoons with aggressive themes. The second was to identify patterns of challenging behaviors that children with ASD have that are not listed on the structured behavior observation schedule or were observed outside of the two experimental conditions. Because this population has been seriously understudied using field research, qualitative data analysis provides new information about observable behaviors in children with ASD, their reactions to violent media, and—to some degree—their media preferences.
Qualitative data analysis also has valuable implications for interpretation of the quantitative results.

In this chapter major study variables and demographic details of the sample, such as different levels of functioning between participants, are discussed. Qualitative data analysis will also be explored. This is followed by discussion of the differences between aggressive behaviors on the Autism Spectrum Disorder-Behavior Checklist (ASD-BC) during free play and cartoon viewing types. Finally, the appropriateness of the participants’ media preferences, limitations of the study, and implications for future research are presented.

**Characteristics of the Sample**

The children in the sample represented a broad spectrum of ages, ethnicities, and levels of functioning, (e.g., they ranged from those who demonstrated no expressive language ability to those who shared elaborate and eloquent retellings of their favorite media). This spectrum of adaptive functioning levels is consistent with extant literature on ASD characteristics (American Psychiatric Association, 2013). One especially notable difference between children in the sample was that children diagnosed with autistic disorder demonstrated significantly more aggressive behaviors during the free play condition than children diagnosed with Asperger’s disorder and PDD-NOS. It is reasonable that children who meet full diagnostic criteria for autistic disorder, and are by definition lower functioning, would exhibit more challenging behaviors, including aggression. This is consistent with the changes to the DSM-5, which collapsed these three diagnostic categories in favor of severity specifiers. Different levels of functioning associated with the various diagnostic categories account for the behavioral differences
identified. Further, the statistically significant differences found between participants based on diagnoses and level of functioning (consistent with diagnostic criteria), as well as differences approaching significance between aggressive behaviors during free play for males and females, is one indication of construct validity for the ASD-BC as this measure is identifying previously well-established behavioral differences.

It was predicted that children in the sample who had received specialized services for a greater proportion of their lives would demonstrate fewer aggressive behaviors on the ASD-BC. This is because specialized services (e.g., speech therapy) can be presumed to improve a variety of the children’s challenges over time (Conner, 2002), especially delays in language abilities. Based on previous studies, better language abilities would be negatively correlated with aggressive behaviors (Colle et al., 2007; Dominick et al., 2007; Estrem, 2005). However, no such correlation was found in this sample. This may be because of the wide variability in adaptive functioning levels mentioned above (e.g., some children who were highly verbal may have had very few years of services because they did not qualify for services, but this made it appear as though there were no differences in aggressive behaviors by years of service). Alternatively, the variable “proportion of years children spent receiving specialized services” may not have been a sufficient approximation of expressive and receptive language abilities.

Even given the broad range of adaptive functioning, several behaviors were documented across all participants. In particular, difficulty reading social cues, difficulty regulating eye contact, and hesitancy to break normal routines were observed in all participants. Many also demonstrated specific stereotypies (motor movements that are repetitive and seemingly purposeless, such as hand flapping or rocking). This indicates
that, despite variability in adaptive functioning, participants shared the core characteristics unique to an ASD diagnosis. These characteristics are consistent with the diagnostic criteria for and associated features of ASD (American Psychiatric Association, 2000; 2013), confirming that the children at these schools were accurately diagnosed and placed at the schools by their multidisciplinary teams.

**Aggression and Other Challenging Behaviors**

Both qualitative and quantitative data were obtained to illustrate and assess aggression and other challenging behaviors in the sample. One-fourth of the participants demonstrated such behaviors outside of the free play and cartoon viewing conditions, which is similar to other studies of aggressive behaviors in children with ASD (Engelhardt, Barthalow, Kerr, & Bushman, 2011). Some of these aggressive behaviors included pulling the researcher’s hair and roughly grabbing the researcher’s wrist. Other aggressive behaviors included hitting, kicking, and spitting, and occurred during extreme tantrums that required visits to an empty “safe” room. In addition, 71% (30 out of 42) of the children in the sample demonstrated at least one aggressive behavior on the ASD-BC during the free play condition and 78% (25 out of 32) of the children did so in the cartoon viewing condition. Aggressive behaviors observed on the ASD-BC tended to be milder than those observed outside of the ASD-BC coding period, and ranged from smacking an object to hitting self with hand. These findings suggest that a sizable proportion of children with ASD are demonstrating at least some aggressive and other problematic actions during regular school time.

One type of challenging behavior not often reported in the current literature on typical characteristics of children with ASD is sexually inappropriate behavior. This was
an unanticipated finding related to the exploratory question regarding types of challenging behaviors children with ASD demonstrate outside of the ASD-BC. Four participants in this sample, all male and all over the age of 12 years old, either touched their own genitals during the study or attempted to rub against or touch the researcher in a seemingly sexual manner. The participants who tried to touch the researcher were fairly easily redirected by teachers or paraprofessionals. Participants who touched themselves were not able to be redirected and teachers responded by actively ignoring the behavior. This observation is noteworthy because both aggressive behavior and inappropriate sexual behaviors may be persistent in children with ASD. In typically developing children, sexually inappropriate behaviors are usually extinguished naturally over time through parental intervention and by peers rejecting children if such behaviors persist. Children with more severe ASD symptoms often require multiple structured trials to reduce challenging behaviors and they also have difficulty reading social cues. Therefore, natural consequences for sexually inappropriate behavior may not be sufficient to extinguish them as these children grow and develop.

Perhaps the most relevant behavior observed involved a lack of attention to the cartoon viewing condition. Only 26% (11 out of 42) of the participants fully attended to the cartoon visually and aurally during the 10 minute viewing condition. Ten of the participants were either unable or unwilling to remain in front of the screen long enough to code their behaviors for a sufficient number of minutes so they could be included in statistical comparisons on the ASD-BC. The majority of sample who remained seated in front of the screen long enough to be included in the cartoon viewing condition avoided the cartoon by not looking and/or not listening to the cartoon. The researcher could not
ascertain how much exposure to the cartoon these participants actually received. That is, outside of external observable behaviors, it was not possible to know how many images or sounds from the cartoon were sensed and perceived by the participants who did not fully attend. This makes it difficult to determine whether the non-significant findings were due to an actual lack of effect or to lack of exposure in the cartoon viewing condition.

Differences Between Free Play and Cartoon Viewing

Extensive literature indicates that typical children, adolescents, and adults are primed for aggressive responses after viewing media with violent themes (Anderson et al., 2010). The primary hypothesis, that participants would exhibit more observable, aggressive behaviors while viewing a cartoon with violent themes than during a period of free play, was not supported. The most likely explanation is the confounding factor that, again, only 11 of the 42 children in the sample were able and willing to fully attend to the cartoon with violent themes for the entire 10 minute observation period. The remaining 31 children engaged in at least one strategy to avoid the cartoon, whether physically walking away and terminating participation or staring at the wall instead of the screen. Most of the 11 children who fully attended were highly verbal compared to their peers, and 3 of those 11 reported familiarity with the cartoon, suggesting that they had previous exposure to cartoons with violent themes.

It may be that children with ASD who are lower functioning are easily overstimulated by violent media and do not prefer it, as has been found in some previous research (Marurek & Engelhardt, 2013). Although most of the children in the sample who tried to avoid the cartoon could not verbalize whether they were overstimulated, it is
interesting to note that many children seemed to actively avoid by stopping the cartoon, covering their ears, or physically leaving the area. These types of behaviors suggest that the cartoon stimulus was aversive. A related explanation is that the children who did not attend fully may have more severely “broken mirrors”; that is, their mirror neurons do not promote connection to and imitation of others in the same way as neurotypical children or higher functioning children with ASD (Hadjikhani, 2006). Children with more severe ASD symptomatology may not engage with, or actively avoid, violent media because, for them, it is both overly stimulating and overwhelming to attempt to connect with the characters in such fast-paced, action-oriented media (Marurek & Engelhardt, 2013). If these children avoid and disengage from violent media, especially novel violent media, they will avoid the negative impact that may be experienced by neurotypical children or higher functioning children with ASD who attend to violent media. Another explanation for the children’s avoidance may be related to the symptom of need for sameness and rigidity in routine. When introduced to a new stimulus (e.g., the cartoon with violent themes), lower functioning children with ASD often require multiple exposures before growing interested in or comfortable with the new stimulus. Based on this sample, there is it seems possible that lower functioning children with ASD may avoid violent media more than higher functioning children with ASD, which, as noted above, may actually be beneficial for them. In addition to the fact that the majority of the sample did not fully attend during the cartoon viewing condition, another possible explanation for the non-significant findings is simply that viewing cartoons with violent themes does not activate observable aggressive behaviors in children with ASD. However, based on the extensive literature on exposure to media violence, that explanation does not seem plausible.
Among the children in the sample who did attend fully to the cartoon, it may be that the impact of viewing cartoons with violent themes is not evident during the actual viewing, but may be evident some time after the viewing, which was not evaluated in the present study.

It is also important to note that the majority of participants demonstrated fewer observable behaviors during the cartoon viewing then during free play. This is not surprising given that the more obvious observation of the participants by somewhat unfamiliar adults during cartoon viewing may have temporarily limited or modified their behavioral repertoire. During the cartoon viewing condition, participants were asked to go to the library, sit down, and attend to the cartoon while being observed by adults with whom they were not very familiar. During the free play condition, it was much less obvious that participants’ behaviors were being observed systematically because they were engaging in their regular routines among their classmates.

**Media Preference**

In the present sample, everyday exposure to violent media may have been low, at least according to children’s reports. At least 8 of the 11 children in the sample who were able and willing to respond to a question about their favorite television show or movie reported age-appropriate media choices based on ratings by the Federal Communications Commission (FCC) or the Motion Picture Association of America (MPAA). Based on these admittedly limited responses, it appears that the media these children consume may be age-appropriate, at least according to the ratings systems. This is consistent with Shane and Albert’s 2008 survey findings that children in their sample overwhelmingly preferred educational, prosocial, or otherwise nonviolent cartoons. Reports from the
present sample also seem consistent with Engelhardt et al.’s (2011) findings that suggest that children with ASD do not prefer violent first person shooter games. However, it must be noted that children with ASD often have discrepancies between their chronological and developmental ages. That is, they may not have reached and mastered the developmental tasks typical for their age range (e.g., a fourteen year old who requires assistance brushing his teeth). This could mean that the standard FCC and MPAA age-based ratings do not apply directly or accurately to children with ASD. In addition, although many of the participants’ television and movies preferences were “age-appropriate” this does not preclude these media from containing some degree of violence, such as cartoon violence that is less realistic or less graphic than live action media violence that uses high quality special effects (Thompson & Haninger, 2001). In the case of children with ASD, parent report may be especially useful in corroborating child media habits and exposure to violent media.

Limitations

Maintaining empirically sound levels of control in the real world circumstances of field research is a well-known challenge (Jarrod & Brock, 2004; Robson, 2011). Attempts were made to observe each participant in a similar free play situation. However, given the participants’ individual needs (e.g., to maintain a routine) and preferences (e.g., surfing the Internet versus jumping on a trampoline), as well as the practical limitations inherent in each teacher’s curriculum, each participant’s free play period was spent engaged in somewhat different activities. This variability likely explains the variability in the types and frequency of their free play, or “baseline,” behaviors. Establishing a true baseline for each participant in a more structured way
would allow for more sound comparisons between the two conditions for all participants in the sample. Despite the high degree of control that is possible in a research laboratory (as opposed to a naturalistic environment like a school), the major drawback to a more controlled setting is that participants with ASD would be likely to have adverse responses to a new environment (e.g., feeling fearful and thus withdrawing completely or having a tantrum), at least initially. Establishing a true behavioral baseline might require observing children in an environment and situation that strikes the balance between foreign but structured and familiar but less structured. As noted earlier, another research design might involve collecting structured observations before, during, and after the experimental session.

In addition to the limitations inherent in working with a severely disabled population in a naturalistic setting, other study limitations must be acknowledged. Careful record review of each participant’s academic record indicated that all participants met full diagnostic criteria for an ASD, but the specific assessment approach was not detailed in the record for many participants. This means that some participants may have received more comprehensive diagnostic assessments than others. Also, for participants whose files did not indicate whether they had a comorbid diagnosis such as Intellectual Disability, it is difficult to know whether they received the proper assessment to rule out such diagnoses, some of which may impact the ability to participate in a study of this nature. Additionally, there was considerable heterogeneity among the sample in terms of adaptive functioning. Examples of such differences include verbal abilities, intellectual abilities, and social responsiveness. In some cases, there were also comorbid medical and mental health disorders that added to the complexity of the sample characteristics. It
should also be acknowledged that the sample encompassed a large age range (7 to 23 years). This was necessary to recruit representative samples from each school, where students ranged in age from approximately 6 to 23 years old. Groups could not be separated and analyzed by age range because there was too much variability in adaptive functioning levels within potential age groups. Taken together, it seems clear that considerable subject variance made finding behavioral differences as a result of a short experimental condition quite challenging.

The estimated effect size of the impact of violent cartoon exposure on immediate aggressive behavioral reactions was predicted to be medium based on the preponderance of relevant past research (Anderson et al., 2010; Anderson et al., 2007; Bushman & Anderson, 2009; Engelhardt et al., 2001; Kirsh, 2006). This medium effect size may have been an overestimate in the population of children with ASD. In the non-significant findings for differences between the mean totals of aggressive behaviors during free play and during cartoon viewing, only a small effect size was found. The present study may not have had a large enough sample size and thus not enough power to detect potential differences, particularly given the previously noted cognitive limitations and other sources of intra-sample variability.

Because the primary measure used in this study, the ASD-BC, was created by the researcher and included items from several validated measures of behavior in children, it is possible that the measure did not address all relevant behaviors or that the organization of the measure items could be improved to increase important psychometric properties (Mesman et al., 2008). Regarding behavioral coding, although the raters were attained good interrater reliability, they were not experts with extensive experience working with
children on the autism spectrum. It is possible that they failed to appreciate and note all observable behaviors demonstrated by participants during the two conditions. Observers also had to move around at times to keep participants in their line of sight while balancing the ASD-BC coding sheets. This could also have influenced their ability to note all observable behaviors.

**Conclusions and Directions for Future Research**

Although the results of the present study could not confirm an immediate effect of violent media on children with ASD, both short and long-term effects of such exposure in this population remain an important question. Previous research indicates that children with ASD have strong preferences for electronic screen media over social interaction (Mineo et al., 2009; Shane & Albert, 2008). In addition, aggression is common in this population, and exposure to violent media is a risk factor for aggressive behavior. Thus, there remains a need to better understand the possible impact of violent media on children with ASD. Several modifications to the present study design may be useful. First, to address the obstacle of obtaining a sample with enough children who clearly attend to the violent cartoon clip, future studies would need a larger sample size or, based on the present study’s findings, a sample of high functioning children with ASD who are more likely to attend to the cartoon. Subsequent to changes in the DSM-5 (American Psychiatric Association, 2013), sample selection should be based on severity specifiers instead of diagnostic categories. To address heterogeneity of the present sample (both within and between the three ASD diagnoses), future studies should have more conservative exclusion criteria or a large enough sample size to take into consideration differences in symptoms and functioning levels within the sample. It should be noted,
however, that accessing a more homogeneous sample from this population would likely require considerable time, financial resources, and commitment from schools and parents. Executing the cartoon viewing condition with a one-way mirror while a familiar adult remains with each participant may increase participant comfort and result in more individually typical responses from the participants. Including additional data on children’s typical behaviors from multiple informants, such as parents and teachers, would be a useful adjunct to direct observation to ascertain whether children’s behavior is affected when observed by somewhat unfamiliar adults. Additional items that might be included in future versions of the ASD-BC and examined in future studies are listed in Appendix G. Future research could also make use of eye tracking devices (Riby & Hancock, 2009) to unequivocally differentiate between children who do and do not visually attend to the cartoon.

Given the lack of research in this area, it was important to first examine children’s immediate reactions to the cartoon. This is confirmed by the fact that the majority of participant in this study did not fully attend to the cartoon. Future studies could benefit from adding one or two levels to the current independent variable; in addition to the free play and violent cartoon viewing conditions, observations of a nonviolent cartoon viewing condition and a post-viewing free play condition could add valuable information about the potential impact of different types of media on children with ASD.

Finally, future studies might include parent report of their children’s behaviors during both non-violent and violent media to compare with the observations made on the ASD-BC and assess the concurrent validity of the ASD-BC. To examine convergent validity, parent report measures of challenging behaviors such as the C-SHARP and the
Nisonger CBRF could also be included. Ideally, children’s behaviors would also be videotaped to allow the most objective and valid coding possible. Additionally, future studies might include parent reports of children’s media preferences to confirm accuracy of children’s reports. Additional qualitative methods, such as Cultural Domain Analysis (Medley, 2008), could be included in future study designs to explore parents’ perceptions of the types of media their children consume, types of challenging behaviors their children demonstrate on a typical day, and specific types of behaviors their children demonstrate during and shortly after media exposure through “free listing” (i.e., stating every response to a question that comes to mind). Grounded theory (Robson, 2011) could also be used as additional research on children with ASD and impact of violent media on their behavior grows. As the prevalence of ASD continues to increase, and the level of violence in media also escalates, there is an obvious need to continue to research the impact that exposure to violent media has children with this disorder and to use future knowledge to improve their quality of life.
References


Anderson, C.A., Shibuya, A., Ihori, N., Swing, E.L., Bushman, B.J., Sakamoto, A.,


Appendix A
Teacher Handout

Children with Autism Spectrum Disorders and Media Experiences

Hello! Thank you for taking the time to read this message. My name is Jackie Pidruzny, and I am working on my doctoral dissertation project. As a part of this project, I am hoping for your help. This project involves learning about the media experiences of children with an Autism Spectrum Disorder. I am hoping for your help in distributing paper copies of requests for participation to the parents of the children in your classroom. I would like parents to understand that I want to make participation as convenient as possible, because I know that parents and teachers alike have extremely demanding schedules!

**Step One:** First, I would provide you with handouts to distribute to parents informing them generally about my project.

**Step Two:** Next, I would provide consent forms to hand out to parents; the parents who decide they can participate in my project will return the signed consent forms to you.

**Step Three:** Finally, I would be arranging a convenient time with you to visit your classroom and observe each child whose parent gave consent individually. As part of the observation, I would like to show each child a cartoon clip during a free period. Observation will take no more than 40 minutes.

Thank you for your consideration! Any help you can offer would be greatly appreciated.

Sincerely,
Jackie Pidruzny

Please feel free to contact me anytime with questions at:
Jacquelyn.Pidruzny@gmail.com

I will be in touch via telephone/e-mail in the next two weeks to see if you will be able to help with my project. Thanks again!
Appendix B
Parent Handout

Children with Autism Spectrum Disorders and Media Experiences

Hello! Thank you for taking the time to read this message. My name is Jackie Pidruzny, and I am working on my doctoral dissertation project. As a part of this project, I am hoping for your help. This project involves learning about the media experiences of children with an Autism Spectrum Disorder. I would like to opportunity to observe your child in his/her classroom at a convenient time.

**Step One:** First, I would provide you with a consent form explaining the project in detail. You can contact me at anytime with questions or concerns.

**Step Two:** Next, I would visit your child’s school at a time that is convenient for your child and his/her teacher. I will be viewing your child’s school record to get some basic information, such as his/her age and autism spectrum diagnosis. I would have a student assistant with me who will help observe your child during recess or free play for 15 minutes.

**Step Three:** Last, we would have your child watch a 15 minute cartoon clip (rated TV-Y7, meaning it is appropriate for children 7 and older) while we observe him/her. Total observation will take no more than 40 minutes.

Thank you for your consideration! I really look forward to the possibility of working with your child.

Sincerely,
Jackie Pidruzny

*Please feel free to contact me anytime with questions at:*

*Jacquelyn.Pidruzny@gmail.com*

*419-530-2717*
CHILD RESEARCH SUBJECT – PARENT INFORMED CONSENT FORM

Children on the Autism Spectrum and Reactions to Cartoon Viewing

Principal Investigator: Jeanne H. Brockmyer, Ph.D. 419-530-2717
Jacquelyn N. Pidruzny, M.A. 419-530-2717 (Secondary Investigator)

Purpose: You are invited to participate in the research project entitled, *Children on the Autism Spectrum and Reactions to Cartoon Viewing*, which is being conducted through the University of Toledo under the direction of Jeanne H. Brockmyer, Ph.D. and Jacquelyn N. Pidruzny, M.A. The purpose of this study is to examine reactions to cartoon viewing among children on the autism spectrum.

Description of Procedures: This research study will take place at your child’s school. After you have reviewed this consent form, had any questions answered, and agreed to have your child participate, Jacquelyn Pidruzny will review your child’s school records to obtain basic information about age, services received, and clinical diagnoses. Jacquelyn Pidruzny and two undergraduate students who have experience with children on the autism spectrum will be visiting your child at school during a time prearranged with his/her teacher. They will observe him/her in the classroom for 15 minutes and then show him/her a short (15 minute) cartoon clip. This cartoon clip will be from Dragon Ball Z Kai, which is rated TV-Y7, meaning it is suitable for children 7 years and older. It will contain some aggressive images (e.g., one character using magical strength to battle another character). However, the cartoon will be age-appropriate, and should be very similar to other cartoon aggression your child has seen before. The total participation for you is the several minutes it will take to review this form. The total participation for your child will be no more than one 40-45 minute session. After you and your child have completed your participation, the research team will debrief you about the data, theory, and research area under study through a flyer provided by your child’s teacher and answer any additional questions you may have about the research.

Potential Risks: There are minimal risks to participation in this study, including loss of confidentiality. There is also some risk that some child may be mildly stimulated from watching cartoon battle scenes.
**Potential Benefits:** By participating in this study, you and your child may benefit from learning about how psychological studies are run. The results of this research may be of interest to you in terms of decisions about your child’s media habits. Also, other parents, children, and researchers may benefit from learning about the results of this research.

**Confidentiality:** The researchers will make every effort to prevent anyone who is not on the research team from knowing that you provided this information, or what that information is. The consent forms with signatures will be kept separate from responses, which will not include names and which will be presented to others only when combined with other responses. Although we will make every effort to protect your confidentiality, there is a low risk that this could be breached.

**Voluntary Participation:** Your or your child’s refusal to participate in this study will involve no penalty or loss of benefits to which you and your child are otherwise entitled and will not affect your relationship with The University of Toledo or with your child’s school. In addition, you or your child may discontinue participation at any time without any penalty or loss of benefits.

**Contact Information:** Before you decide to accept this invitation to take part in this study, you may ask any questions that you might have. If you have any questions at any time before, during, or after your participation you can contact a member of the research team, Jeanne H. Brockmyer, Ph.D. or Jacquelyn N. Pidruzny, M.A. at 419-530-2717.

If you have questions beyond those answered by the research team or your rights as a research subject or research-related injuries, the Chairperson of the SBE Institutional Review Board may be contacted through the Office of Research on the main campus at (419) 530-2844.

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over.

**SIGNATURE SECTION – Please read carefully**

You are making a decision whether or not to allow your child to participate in this research study. Your signature indicates that you have read the information provided above, you have had all your questions answered, and you have decided to allow your child to take part in this research.

The date you sign this document to enroll in this study, that is, today’s date must fall between the dates indicated at the bottom of the page.

<table>
<thead>
<tr>
<th>Name of Child Participating</th>
<th>Child’s date of birth</th>
</tr>
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<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of Parent/Guardian (please print)</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>
This Child Research Subject – Parent Informed Consent document has been reviewed and approved by the University of Toledo Social, Behavioral, and Educational IRB for the period of time specified in the box below.

Approved Number of Subjects: ________________
Appendix D
Information Gathered from Student Records and During Observation

Student Record
Participant Number:

______________________________________________________

Sex:

______________________________________________________

Age:

______________________________________________________

Date of Birth:

______________________________________________________

Ethnicity/Race:

______________________________________________________

Diagnoses:

______________________________________________________

______________________________________________________

Types of services received:

______________________________________________________

Date services began:

______________________________________________________

Additional Notes:

______________________________________________________

______________________________________________________

______________________________________________________

______________________________________________________
During Observations

Additional Notes:

______________________________________________________

______________________________________________________

______________________________________________________

______________________________________________________

______________________________________________________
# Appendix E
Autism Spectrum Disorder – Behavior Checklist (ASD-BC)

Participant Code: __________  Condition: __________  Minute: __________

<table>
<thead>
<tr>
<th><strong>Affective</strong></th>
<th><strong>FACE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Blinks repeatedly</td>
<td></td>
</tr>
<tr>
<td>2. Cries/Frowns</td>
<td></td>
</tr>
<tr>
<td>3. Grimaces/Winces</td>
<td></td>
</tr>
<tr>
<td>4. Opens mouth</td>
<td></td>
</tr>
<tr>
<td>5. Scowls/Angry face</td>
<td></td>
</tr>
<tr>
<td>6. Smiles</td>
<td></td>
</tr>
<tr>
<td>7. Stares</td>
<td></td>
</tr>
<tr>
<td>8. Sticks out tongue</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Aggressive Behavior</strong></th>
<th><strong>OBJECTS/OTHERS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Breaks object</td>
<td></td>
</tr>
<tr>
<td>2. Bites object/person</td>
<td></td>
</tr>
<tr>
<td>3. Hits object/person</td>
<td></td>
</tr>
<tr>
<td>4. Kicks object/person</td>
<td></td>
</tr>
<tr>
<td>5. Spits</td>
<td></td>
</tr>
<tr>
<td>6. Throws object</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Body Movements</strong></th>
<th><strong>BODY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bangs head</td>
<td></td>
</tr>
<tr>
<td>2. Climbs on something</td>
<td></td>
</tr>
<tr>
<td>3. Flaps hands</td>
<td></td>
</tr>
<tr>
<td>4. Jumps/Bounces</td>
<td></td>
</tr>
<tr>
<td>5. Rocks back &amp; forth</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6.</td>
<td>Runs around</td>
</tr>
<tr>
<td>7.</td>
<td>Sits down (1x)</td>
</tr>
<tr>
<td>8.</td>
<td>Spins</td>
</tr>
<tr>
<td>9.</td>
<td>Sniffs object/person</td>
</tr>
<tr>
<td>10.</td>
<td>Stands up (1x)</td>
</tr>
<tr>
<td><strong>Self-Aggression</strong></td>
<td><strong>SELF</strong></td>
</tr>
<tr>
<td>1.</td>
<td>Bites self</td>
</tr>
<tr>
<td>2.</td>
<td>Hits self with hand</td>
</tr>
<tr>
<td>3.</td>
<td>Hits self with object</td>
</tr>
<tr>
<td>4.</td>
<td>Pinches self</td>
</tr>
<tr>
<td>5.</td>
<td>Pulls hair</td>
</tr>
<tr>
<td>6.</td>
<td>Scratches self</td>
</tr>
<tr>
<td><strong>Verbal</strong></td>
<td><strong>SOUNDS</strong></td>
</tr>
<tr>
<td>1.</td>
<td>Grunts</td>
</tr>
<tr>
<td>2.</td>
<td>Says words</td>
</tr>
<tr>
<td>3.</td>
<td>Says non-words</td>
</tr>
<tr>
<td>4.</td>
<td>Sings</td>
</tr>
<tr>
<td>5.</td>
<td>Squeals</td>
</tr>
<tr>
<td>6.</td>
<td>Screams</td>
</tr>
<tr>
<td>7.</td>
<td>Swears</td>
</tr>
<tr>
<td>8.</td>
<td>Whistles</td>
</tr>
</tbody>
</table>
Appendix F
Follow Up Questions

Participant Number: __________

What did you think of the cartoon?

________________________________________________________________________

________________________________________________________________________

What is your favorite TV show or movie?

________________________________________________________________________

Have you seen this cartoon before?

________________________________________________________________________
Appendix G

Possible Behaviors to Include on Future Versions of the ASD-BC

Turns off cartoon
Looks away from cartoon
Leaves area where cartoon is displayed
Turns down volume
Removes earphones
Covers ears
Makes comment on cartoon
Pulls other’s hair
Grabs at others
Holds onto/will not release others
Touches own genitals
Attempts to touch others’ private areas with hand
Attempts to rub genitals on others
Belches
Shivers
Yawns