Functions of Challenging Behaviors and Strategies Utilized to Decrease Challenging Behaviors:

Teachers' and Parents' Reports of Children with and Without Autism Spectrum Disorder

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Submitted in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy
under the Executive Committee
of the Graduate School of Arts and Sciences

COLUMBIA UNIVERSITY

2019

ProQuest Number: 13807178

ProQuest 13807178

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789 East Eisenhower Parkway
P.O. Box 1346
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ABSTRACT

Functions of Challenging Behaviors and Strategies Utilized to Decrease Challenging Behaviors: Teachers' and Parents' Reports of Children with and Without Autism Spectrum Disorder

Suzzanna Javed

Challenging behaviors are considered predictors of poor outcomes and children with Autism Spectrum Disorder (ASD) are at increased risk for such behaviors. There is limited research on how the functions of such behaviors and intervention strategies aimed at reducing them may differ by context. Using a researcher-designed survey, this study examined parents' and teachers' descriptions of the function of, and strategies for, challenging behaviors among children with and without ASD. A total of 488 respondents completed the survey, including 251 (51.5%) teachers and 237 (48.5%) parents. The participants were recruited in person and via social networking using snowballing and word-of-mouth. The study findings revealed that while both parents and teachers frequently identified avoidance/escape and attention-seeking as functions of challenging behaviors for children with and without ASD, there were some differences in their reports. Most notably, for children with ASD, 28% of parents reported children's use of challenging behaviors to get attention at home whereas 2% reported this function at school, while 72% of the teachers indicated children's use of challenging behaviors to seek attention at school and only 10% reported this function at home. The two most common intervention strategies identified by both teachers and parents were reinforcing positive effortful behavior and providing positive attention such as praise and acknowledgement. These finding are critical as they show the differences in the opinions towards the use of challenging behaviors in the home and school settings as reported by parents and teachers and inform future intervention efforts aimed at addressing challenging behaviors in varying contexts.

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ACKNOWLEDGEMENTS

DEDICATION

This dissertation dedicated to Javed Yousuf (Abu) and Parveen Javed (Ami) for their prayers,

love and support.

This is also dedicated to my friends and students with disabilities.

You all have inspired and taught me with your amazing lives.

"Suzi, I knew you are more than PhD manuscript." Dad

Chapter I

INTRODUCTION

Background and Need

Child development is marked with many critical achievements for children to master. Children's ability to acquire behavioral and emotional self-regulation and competence is considered to be one significant foundation during early development (Lane, Paynter, & Sharman, 2013). Indeed, Phillips and Shonkoff (2000) stated that self-regulation is a "cornerstone of children's development" which serves as a critical component in their development trajectories. Therefore, without adequate self-regulation, children may be at risk for challenging behaviors. According to Smith and Fox (2003), challenging behaviors are any repetitive behavior patterns or perceptions of behavior which interfere with children's ability to gain optimal learning or engagement in social interactions with their peers and older people. Fox and Lentini (2006) defined *challenging behaviors* as persistent noncompliance, problems regulating emotions, inability to form relationships with adults or peers, and difficulty engaging in learning activities.

Challenging behaviors often take the form of disrupted eating behavior, sleeping disorders, physical and verbal aggression, self-injury, tantrums, withdrawal, and non-compliance, among many other forms. The majority of children pass through developmental stages exhibiting some challenging behaviors (Lane et al., 2013). For most children, such behaviors dissipate with the children's maturation during their early years, while they may escalate in other children marking problematic development, social maladjustment, and even academic failure (Østvik, Eikeseth, & Klintwall, 2012). The intensity, persistence, and pervasiveness of the behaviors indicate their seriousness (Shaw, Bell, & Gilliom, 2000).

Moreover, challenging behaviors in young children are embedded in children's relationships and interactions with their caregivers (e.g., parents and teachers). Thus, children's challenging behaviors jeopardize their growth in other domains, and have implications for their functioning at home and in academic settings (Doubet & Ostrosky, 2015).

Challenging Behaviors in Autism Spectrum Disorder

Challenging behaviors are a common concern for children with and without disabilities (Horner, Carr, Strain, Todd, & Reed, 2002; McClintock, Hall, & Oliver, 2003). Among children with disabilities, behavior problems are a particular concern for children with Autism Spectrum Disorder (ASD). These children often demonstrate challenging behaviors that are debilitating and can be frequent, intense, or long-lasting; therefore, they may disrupt their learning abilities as well as restrict access to facilities and services in the community (Matson & Shoemaker, 2009). According to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM–5*; American Psychiatric Association [APA], 2013), Autism Spectrum Disorder (ASD) is a neurological developmental disorder which is characterized by difficulties that fall into two broad categories: (a) persistent deficits in social communication and social interactions, which occur across multiple contexts and are manifested with a current or past history of social-emotional reciprocity deficits, and (b) restricted and/or repetitive patterns of behavior and interests that are manifested in motor movements, speech, or objects use, and unusual hyper- or hypo-activity in response to sensory input. The signs, symptoms, and severity of ASD may be different in each individual. In addition, ASD is more common in boys than in girls (Christensen et al., 2016). Hansen, Schendel, and Parner (2015) noted that challenging behaviors occur in 13-30% of children with ASD, indicating the need to address these behaviors in this population of children. Children with ASD and developmental disabilities usually demonstrate challenging

behaviors such as self-injury, aggression, noncompliance, and irritability, among others, that may be difficult to address and even understand (Matson & Nebel-Schwalm, 2007). These behaviors occur more in children with ASD than in children with any other developmental conditions (Bronsard, Botbol, & Tordjman, 2010; Farmer & Aman, 2011; Mayes et al., 2012; McClintock, Hall, & Oliver, 2003), possibly because these children experience difficulty in interpreting social situations as well as difficulties in communicating what they need.

Several other factors are associated with challenging behaviors in ASD and these include stress, anxiety, distressing situations, and differences in sensory processing (Farmer & Aman, 2011). Mazurek, Kanne, and Wodka (2013) found that challenging behaviors are a frequent concern for parents of children with ASD and can contribute to an increase in family stress, financial distress, and expectations on caregivers. Kanne and Mazurek's (2011) study on the parent ratings of challenging behaviors revealed that the prevalence of severe physical aggression was 56%, as measured by the ASD Diagnostic Interview-Revised scale.

Impact of Challenging Behaviors

According to Gur (2018), challenging behaviors can cause many problems, especially for people with disabilities, their families, and the society at large. Challenging behaviors are a major impediment to an individual's independent living as they impact on socialization as well as access to community-based services, among other factors (Gur, 2018). Whitted (2011) suggested that children who exhibit challenging behaviors during the preschool years have shown the tendency to drop out of school, join a gang, be incarcerated as an adult, and experience an early death. Furthermore, these challenging behaviors limit educational, vocational, developmental, and social opportunities for individuals with disabilities (Davis & Rispoli, 2018). Several other negative outcomes of challenging behaviors include both physical

and chemical restraint. Dunlap et al. (2006) suggested that when challenging behaviors are not identified and treated immediately, more intensive interventions and resources are required to reduce those behaviors over time. Moreover, lack of treatment increases the probability of poor academic performance, social rejection, and stressful effects on families of children dealing with challenging behaviors (Dunlap et al., 2006).

Typical Development

Challenging behaviors in children need to be separated from independent behaviors that are usually suitable for this age (Shaw et al., 2000). Children 2 to 10 years of age experience increased mobility as part of their normal development; hence, it is normal for them to show aggression as well as non-compliance towards family members (Dishion et al., 2008; Lefevre, 2014). The major difference between challenging behaviors and typical behaviors among children is the severity of the impact on a child's development, learning, functioning, and interaction with others (Østvik et al., 2012). Challenging behaviors impede the functioning and development of a child which may cause adverse effects on a child's academic performance at school. Such challenging behaviors include; temper, aggression, non-compliance among others. Other behaviors such as feeding problems, toilet training and rivalry among siblings' impact on a child's functioning and relationships. These behaviors are challenging behaviors that highly impact on a child's development and functioning, yet they are beyond developmentally expected behaviors.

In typical children, different challenging behaviors have been found. A study by Holtz, Fox, and Meurer (2015) found that over 60% of children aged 1-5 years lacking any developmental or physical disability had challenging behaviors such as bothering others, hitting others, having temper tantrums, and refusing to go to bed. In addition, a report by Qi and Kaiser

(2003) indicated that challenging behaviors were likely to be found in children from low-income settings. Therefore, it is important to note that younger developing children are likely to exhibit challenging behaviors.

Challenging behaviors have also been associated with functional difficulties in typically developing children because children experience independent behaviors that are usually normal for this age (Shaw et al., 2000). However, like children with ASD, they also experience challenging behaviors that are dependent on their severity on a child's development (Østvik et al., 2012). Normal behaviors that are common in typically developing children include feeding problems, toilet training, and rivalry among siblings, which are challenging behaviors and can highly impact a child's functioning and relationships, yet are beyond developmentally expected behaviors. A report by Dishion, Capaldi, Spracklen, and Li (1995) indicated that challenging behaviors exhibited by typically developing children are strong indicators of delinquency and involvement in unwarranted behaviors in later years. These problems, if not redirected into successful everyday behaviors, are likely to become more intense in adolescence and result in serious violent behaviors in adulthood (Burbach, Fox, & Nicholson, 2004).

Dunlap et al. (2006) suggested that challenging behaviors potentially lead to future maladjustment in school and adult life, even for typically developing children. For this reason, professionals across various disciplines have sought resources and training to identify the functions of challenging behaviors as well as effective interventions to decrease these behaviors, even in children with typical development (Dunlap et al., 2006). Furthermore, research has indicated that correctly identifying the functions of challenging behaviors and subsequently selecting appropriate evidence-based practices and strategies are essential in decreasing their

occurrences in children with ASD as well as those with typical development (Dunlap et al., 2006).

Additionally, Powell, Dunlap, and Fox (2006) found that children exhibiting challenging behaviors that are not receptive to classic support or intervention may experience difficulties later in their academic life. The authors also emphasized the importance of inclusion for children exhibiting challenging behavior in typical family activities and routines for healthy functioning of the family since they are likely to experience seclusion from the community (Powell et al., 2006).

Children with Disabilities

Children with developmental disabilities have been shown to exhibit challenging behaviors which persist throughout their lives (Williams, Armstrong, Agazzi, & Bradley-Klug, 2010). A study by Einfeld, Tonge, Turner, Parmenter, and Smith (1999) sought to determine challenging behaviors in young males diagnosed with various disorders such as Fragile X, Plader-Willi Syndrome, Down Syndrome, or Williams Syndrome. The researchers used a developmental behavior checklist and monitored the young males over a 4-year period. This included monitoring a subscale of disruptive behavior such as irritability, antisocial behavior, aggression, and manipulative behaviors. Based on the study results, the disruptive behaviors of the young males were unchanged over the 4 years. There are recommendations on the reduction of challenging and aberrant behaviors in children, as described by Green, O'Reilly, Itchon, and Sigafoos (2005). This study indicated that after 3 years of monitoring changes in aberrant behavior among children with developmental disabilities and enrolled in a school with special education teachers, the behaviors notably improved. This study concluded that reduction of

challenging behaviors in children begins at home with the parents and focus should not be on the school setting.

Children with Autism Spectrum Disorder

Children with ASD can exhibit challenging behaviors either as toddlers or as young children (Rzepecka, McKenzie, McClure, & Murphy, 2011). A study by Green et al. (2005) revealed that a high prevalence rate of challenging behaviors existed among children with ASD. These challenging behaviors are problematic as they can be physically dangerous, thus impeding the children's daily activities, and include temper tantrums, self-injury, noncompliance, destructive behavior, and aggression.

Another study by Keller and Fox (2009) indicated that extreme behavioral issues such as temper tantrums, aggression, hyperactivity, and so on can lead to young children being referred to mental hospitals. Rzepecka et al. (2011) analyzed challenging behaviors in children with ASD by measuring tantrum and conduct behaviors and they found that children with ASD had higher levels of behavior problems. These studies illustrated that children with ASD experience challenging behaviors and, hence, require appropriate interventions and support.

The Functions of Challenging Behaviors in Home and School Contexts

Challenging behaviors have been shown to serve various functions in children with ASD. Therefore, to decrease challenging behaviors successfully, it is important to first understand the specific function that the behavior is playing (Matson et al., 2011). Challenging behaviors may play a number of functions and examples may include indication for boredom, attention seeking, confusion about a task they are meant to perform, discomfort the child is feeling with something in the environment, or difficulty communicating their needs (Falcomata, Muething, Gainey,

Hoffman, & Fragale, 2013). All these increase the challenging behavior because they serve a specific function.

It is very common for children with challenging behaviors to behave differently at school and at home. Attwood (1998) has referred to this as the "Jekyll and Hyde" character. Just because a challenging behavior occurs at school does not mean that the trigger of that behavior is also at home, thus the child's behaviors may appear very different in the two contexts. Children may be experiencing difficult situations at home and contain their emotions until they get to school. A child's developmental, academic, and social functioning can be adversely affected by challenging behaviors (Doubet & Ostrosky, 2015; Keenan & Wakschlag, 2000). Managing challenging behavior can be both stressful for the parent at home and the teacher at school. Teachers are required to be aware that children who appear to be coping at school may be experiencing very high stress levels. On the other hand, parents feel responsible for their children's behavior. Dishion, French, and Patterson's (1995) findings demonstrated that typically developing preschoolers who exhibit challenging behaviors are more likely to commit crimes, be involved in a gang, and be imprisoned later in life. This was further stressed by Dunlap et al. (2006) who suggested that challenging behaviors can potentially lead to future maladjustment in adolescent and adult life, even for typically developing children. Both teachers and parents have used evidence-based strategies to decrease challenging behaviors (Chai & Lieberman, 2016).

Strategies for Decreasing Challenging Behaviors

Several intervention approaches are available in decreasing challenging behaviors in children with ASD. Among these interventions, behavior-based interventions are the most widely used in teaching new skills and trying to modify challenging behavior in children with ASD (Sarala, Junni, Cooper, & Tarba, 2016). Social community norms play a major role in the development of interventions that help decrease challenging behavior. One important aspect is recognizing the cultural diversity of the children with ASD; hence, strategies that are culturally diversified need to be developed (Fong & Lee, 2017). Interventions that are culturally sensitive recognize that children with ASD are from diverse cultural backgrounds and their needs should be addressed based on sociocultural contexts within their adaptive environment (Sarala, Junni, Cooper, & Tarba, 2016). These interventions should also integrate appropriate cultural views that are important in the design and implementation of the interventions. Applied behavior analysis is one of the common strategies used to decrease challenging behaviors in children with ASD (Fong & Lee, 2017). Cultural knowledge has been shown to develop effective behavior analytic interventions. It does so by recognizing variations in interventions as well as understanding their functional relationships. Examples include verbal relations that differ in different cultural communities (Fong & Lee, 2017). In conclusion, by taking time to understand the social-cultural environment of children with ASD, better strategies for decreasing challenging behavior can be developed which will contribute greatly in the management of ASD.

Numerous strategies have been utilized to decrease challenging behaviors by both teachers and parents of children with or without Autism Spectrum Disorder (ASD). In a review by Montgomery et al. (2014), the types of interventions used to reduce challenging behaviors were classified according to seven categories based on sample articles, namely: stimulus-based,

instructional-based, extinction-based, reinforcement-based, punishment-based, system-change, and other interventions not described with sufficient detail. The effectiveness of each intervention used to reduce challenging behavior was calculated. Of the 38 interventions for which effectiveness was determined, only one intervention produced a negative reduction indicating an increase in problem behavior rates. Of the 37 interventions, 16 produced over 90% positive reduction. The study results indicated that in children with ASD, stimulus- and reinforcement-based strategies produced the highest percentage (over 70%) of reductions in challenging behaviors. These findings were consistent with other studies that reported reduction in challenging behaviors (Brosnan & Healy, 2011; Horner, Carr, Strain, Todd, & Reed, 2002).

Challenging behaviors in children with ASD are a major concern since without proper interventions, the challenging behaviors tend to persist. As such, the presence of challenging behaviors in children with ASD has clear implications for the need to develop effective strategies that can help decrease the challenging behaviors. One strategy to address challenging behavior is engaging the individual with ASD in a communicative development process. Several strategies have been developed for using communication to remediate challenging behaviors. Carr and Durand (1985) documented possible predictable relationships between challenging behaviors and environmental circumstances. Their study indicated that reduced adult attention and increased levels of task difficulty were associated with misbehavior. Therefore, teaching children to solicit verbally for attention and assistance through functional communication training led to the suppression of problem behaviors.

Challenging behaviors persist in children with disabilities who do not receive appropriate interventions (Murphy et al., 2005). Studies have shown that interventions that were implemented based on pre-assessment and functional analysis demonstrated significant effects in

reducing the challenging behaviors of young children (Dunlap et al., 2006; Horner et al., 2002; Montgomery et al., 2014). Finding replacement behaviors as teaching procedures have also shown to be effective in reducing challenging behaviors significantly (Montgomery et al., 2014). Challenging behaviors were reduced when features of a child's social and physical activities were altered as part of the intervention (Montgomery et al., 2014).

Another strategy is antecedent-based interventions which are used to change conditions in the environment that can prompt an individual to engage in challenging behaviors (Parsonson, 2012). Additionally, contingency-based strategy is a form of operant conditioning in which positive reinforcement is used to change behavior. In contingency-based interventions, the reinforcement follows the target behavior (Skinner, 1981). Giving a child reinforcement following completion of a target task is an example of contingency-based strategy. Research has demonstrated that positive and functional learning environments can minimize challenging behaviors and reward engagement and achievement (Kleinman & Saigh, 2011).

According to Rahn et al. (2017), teachers of children with ASD are required to know a variety of evidence-based strategies to decrease challenging behaviors. These evidence-based strategies include antecedent-based interventions, differential reinforcement, extinction, and response interruption/redirection. Antecedent-based interventions are used to change the environmental conditions that prompt an individual to engage in a target behavior (Horner et al., 2002). An example of an antecedent-based strategy is the removal of excess materials from the desk of an ASD student who engages in harmful throwing behaviors. By simply removing possible throwing materials from within his or her vicinity, the student is less likely to cause destruction. Differential reinforcement refers to the contingent reinforcement of appropriate responses while discouraging challenging behaviors, and this results in a decrease in the

occurrences of challenging behaviors (Horner et al., 2002). Extinction is the withdrawal of reinforcement for previously reinforced behavior, which decreases future emissions of this behavior (Horner et al., 2002). Teachers have frequently used this to address inappropriate joking behaviors in students; they coach the class to ignore such behaviors, thereby decreasing the possibility of such challenging behaviors recurring. Research has demonstrated that when behavioral strategies are implemented among children with ASD, they can decrease the occurrence of challenging behaviors as well as increase meaningful participation in the classrooms (Rahn et al., 2017).

Frea and Hepburn (1999) found that even though professionals have been using functional assessment to design interventions with the sole purpose of dealing with challenging behaviors, parents do not often seem to have those skills. Therefore, Frea and Hepburn (1999) studied parents' ability to acquire skills associated with functional assessment and independently develop strategies to decrease challenging behaviors. The results of this study demonstrated that only one of the two families participating in the study was able to utilize functional assessment information to independently develop an effective strategy to decrease challenging behaviors. However, it was demonstrated that the functional assessment information was not enough for the second family in the study; therefore, they required an additional briefing instructional session on effectively utilizing the strategy. Furthermore, the findings of the study indicated that when parents utilized such strategies, their children improved in their communicative, play, and social skills (Charlop & Rispoli, 2018).

Meadan and colleagues (2016) revealed the importance of identifying the function of challenging behavior and planning strategies to decrease the challenging behaviors. This study suggested that once the function of the challenging behavior is identified, intervention strategies

are matched accordingly. The *54 evidence-based strategies* used in the experimenter-designed survey are based on three types: (a) antecedent-based, focusing on what happens before a behavior; (b) consequences-based, focusing on what happens after the behavior; or (c) replacement-based, focusing on a socially acceptable skill that replaces the target behavior (Meadan, Ayvazo, Yellin, & Ostrosky, 2016). Unfortunately, most of the research in this area of treating challenging behaviors are single-case studies or have small research samples, which fail to indicate significant effects. These limitations have thus far proven to be a major significant disadvantage to this field (Machalicek et al., 2009; Montgomery et al., 2014).

Significance of the Study

Children with ASD exhibit many challenging behaviors that are difficult for their parents at home as well as for their teachers at school. Given the pervasive nature of ASD and its effects on children both at home and at school, it is important to understand the differences between parents' and teachers' identification of different functions of challenging behaviors as displayed by children with and without ASD. One major and essential component of the effective management of challenging behaviors is the use of evidence-based strategies by parents and teachers. However, because these strategies vary at home and at school, this study will help in understanding the different strategies used by the parents and teachers to decrease challenging behaviors of children with or without ASD. The study results will add to the body of knowledge on the different forms of identification strategies parents and teachers use to identify different functions of challenging behaviors as displayed by children with and without ASD. In addition, by understanding the different evidence-based strategies used by parents and teachers, these data will help in designing and establishing parent and teacher education trainings on effective behavioral interventions that will lead their children towards productive and successful futures.

Such knowledge will help both teachers, parents, and caregivers look into more ways of helping their children with or without ASD to live productive and successful lives.

Theoretical Frameworks

The causes of challenging behavior have been described based on two theoretical approaches: the behavioral approach and the biological approach. This study was based on a behavioral theory of challenging behavior which, in all its forms, proposes that challenging behaviors are learned and maintained through their consequences, just as all other operant behaviors.

The Operant Theory of Challenging Behavior

This theory proposes that challenging behaviors are behaviors for which a contingent reinforcer or a reward increases their future occurrence (Wood & Alderman, 2011). In addition, the removal of the contingent reinforcement or reward is theorized to affect the future occurrence of the challenging behaviors by decreasing their frequency. Antecedents to challenging behavior are guided by the establishment of operations and discriminative stimuli which act as behavior motivators to indicate the presence or absence of a reinforcement (Clark, Leonard, Cano, & Pester, 2018). One of the best ways to illustrate an operation for challenging behavior is attention deprivation, whereby at the occurrence of a challenging behavior, attention acts as a reinforcer, whereas the discriminative stimulus is the presence of an individual (Wood & Alderman, 2011).

Operant conditioning plays an important function in the development and maintenance of individuals with behavior problems. The operant behavior model is divided into stages. In stage one, repetitive behaviors have been proposed to be dependent on the state, internally regulated and appropriate developmentally (Richmna & Linaduer, 2005). In the second stage, the repetitive

behaviors influence or can be influenced through the environment, becoming an adaptive response. In the third stage, which is also the also the last stage of the model, the repetitive behaviors evolve through the operant process. Challenging behaviors can be developed through several behavioral mechanisms. This has been supported by researchers who identified some topologies of challenging behaviors that have evolved from early stereotypic behaviors in children with disabilities (Richmna & Linaduer, 2005).

To further enhance the behavior model, a mutual reinforcement paradigm has been developed, based on the operant reinforcement of behavior (Whitney & Barnard, 2017). Evidence also indicate that social reinforcement plays an important role in the development of challenging behavior. Petty, Allen, and Oliver (2009) identified the existence of a strong temporal association between challenging behavior and repetitive behavior.

Communication Theory

The communication theory of challenging behavior was proposed by Carr and Durand (1985). This theory acknowledged the role of social reinforcement, as did operant theory. However, communication theory focused more on the notion of pragmatics, with its main premise being that challenging behaviors function as nonverbal communicative acts, which are also similar to other nonverbal behaviors (Wong et al., 2015). This theory is supported by the inverse relationship between communicative skills and behavioral problems, which indicates that for individuals with disabilities, challenging behaviors function similarly to communicative behaviors to gain attention and obtain a desired object (Carr & Durand, 1985). Research has indicated that typically developing 2-year-old children demonstrate communicatively functional aggression (Ninio, 2018). However, as the children grow older, aggression becomes extinct, due to the functionally equivalent verbal communicative behaviors they acquire over time to replace

the challenging behaviors. However, children with severe intellectual disabilities are less likely to acquire these functionally equivalent behaviors and thus continue to rely on the communicative function of challenging behaviors.

Functional communication training proposes that challenging behaviors function as a communication form which teaches individuals appropriate communicative behaviors. Carr and Durand (1985) identified the function of challenging behavior of four children with intellectual disabilities. Each of the participants was taught both relevant and irrelevant responses; the study results indicated that only the functional relevant response led to reduced challenging behaviors (O'Nions, Happé, Evers, Boonen, & Noens, 2018). Many more studies have provided further evidence for the effectiveness of functional communication training to reduce challenging behaviors.

Automatic Reinforcement Theory

Automatic reinforcement theory indicates that operant behaviors can be reinforced by internal variables that are present in an individual and not those within the environment (Minshawi, Hurwitz, Morriss, & McDougle, 2015). The reinforcement of the behavior is not mediated through the action of another person. Patel, Carr, Kim, Robles, and Eastridge (2000) defined these behaviors as non-social as they are independent of the social environment. An example is health problems that are associated with chronic pain; these lead to challenging behaviors to try and relieve the pain and may possibly result in self-injury**.** Two classes of automatic reinforcement exist: positive and negative reinforcement. Positive reinforcement occurs when individuals are able to obtain something through their own behavior, whereas negative reinforcement occurs when individuals avoid something thorough the influence of their

own behavior (Patel et al., 2000). Behaviors maintained through automatic reinforcement have been referred to as self-stimulatory.

Much theoretical and empirical support exists on why operant theories of challenging behavior are important. In addition, communication theory recognizes the need for social reinforcement as well as pragmatic communication and provides a basis for functional communication training. Together, these behavioral theories of challenging behavior help in understanding the behavior as well as providing effective intervention strategies for challenging behaviors.

Statement of the Problem

Previous studies have evaluated and reviewed functions and strategies to decrease challenging behaviors. Both teachers and parents have been shown to use evidence-based strategies to decrease challenging behaviors (Simonsen, Fairbanks, Briesch, Myers, & Sugai, 2008). However, only limited research has described the differences between teachers and parents in identifying the functions of challenging behaviors in children with and without ASD and in the strategies teachers and parents use to decrease the challenging behaviors of children with and without ASD. This study aims to investigate the functions of challenging behaviors of children with and without ASD and the strategies utilized by teachers and parents to decrease these behaviors.

Purpose of the Study

Children exhibit challenging behaviors which can adversely affect their development, academic success, functioning, and social interactions. Children with ASD also exhibit challenging behaviors that are usually persistent throughout their lifetime. The challenging behaviors include aggression, antisocial behaviors, irritability, and manipulative behaviors. All

behaviors are triggered by an environmental stimulus that is referred to as the function of that that specific behavior. Common functions of any behavior are (a) attention, (b) escape, (c) sensory, and (d) tangible activities (Low & Webster, 2016). The reduction of challenging behaviors in children lies with their parents and teachers. For both parents and teachers, the first step is to determine the function of the challenging behavior—that is, to understand why the behavior is occurring in order to improve on it. Because school and home environments are different, they could trigger different challenging behaviors in both children with and without ASD. Therefore, teachers and parents need to take proactive approaches to determine what in the environment triggers the behaviors and what keeps it occurring. In this case, the function of the challenging behavior is more important than the form, as it tells us how to address it. By knowing these details, then, parents and teachers can make changes proactively in the environment and also teach children better ways to overcome challenging behaviors. In addition, an increase in functional communicative competence both in class and at home leads to a decrease in challenging behaviors. Thus, the first purpose of the present study is to explore the functions of challenging behaviors, as reported by parents and teachers of children with and without ASD.

More targeted interventions towards challenging behaviors are required both at school and at home and may include both disciplinary and support interventions. Teachers use different strategies to address challenging behaviors and are dependent on the nature and severity of the behaviors. These strategies include the development of a support plan, environmental changes, teaching of replacement behaviors, use of student support groups, use of appropriate disciplinary measures, and use of learning management options such as re-engagement programs, among many other strategies. The strategies parents use to address challenging behaviors at home may

differ from those of the teacher and include understanding the child well, understanding the

meaning of the behavior, determining the types of environments that trigger the behavior, and

intervening with compassion. Parents can use visual supports, organize the environment to

promote clear expectations, provide more choices to the child, and regulate sensory experiences

to calm the child. All these strategies provide replacement behavior as well as provide general

skills that promote desirable behaviors in children—coping and tolerance skills. Therefore, the

second purpose of this study is to describe differences between parents and teachers in the use of

evidence-based strategies to deal with challenging behaviors of children with or without ASD.

Chapter II

REVIEW OF LITERATURE

The aim of Chapter II is to review the literature on the functions of challenging behaviors and strategies utilized in dealing with challenging behaviors in young children aged 2 to 10 years with and without Autism Spectrum Disorder (ASD). Challenging behavior is a common concern for children with and without disabilities (Horner, Carr, Strain, Todd, & Reed, 2002). Research indicates that school-aged children with disabilities demonstrate challenging behaviors, such as aggression, noncompliance, self-injury, and stereotypy (McClintock, Hall, & Oliver, 2003). Furthermore, challenging behaviors are a major concern for young children with ASD and are considered particularly difficult to manage by both teachers and parents if there are no proper interventions for their management (Hart & Whalon, 2013; Horner et al., 2002).

Challenging behavior is defined as "culturally abnormal behavior(s) of such intensity, frequency or duration that the physical safety of the person or others is placed in serious jeopardy, or behavior which is likely to seriously limit or deny access to the use of ordinary community facilities" (Emerson, 2001, p.3). Powell et al. (2007) defined challenging behavior as "any repeated pattern of behavior or perception of behavior that interferes with or is at risk of interfering with optimal learning or engagement in pro-social interactions with peers and adults" (p. 83). According to Fox and Lentini (2006), challenging behaviors consist of four components: persistent noncompliance, problems regulating emotions, inability to form relationships with adults or peers, and difficulty engaging in learning activities. Research has indicated that when challenging behaviors are intense and physical, access to the community and its facilities may be limited (Emerson et al., 2001). Challenging behavior in this study is defined as an abnormal

behavior that is persistent, affects the physical safety of the person, and risks and limits the engagement of the individual in a social setting. Challenging behaviors can be classified into seven major categories: (a) physical or personal assault which includes spitting, biting, hitting; (b) property destruction (object assault); (c) inappropriate verbalization (e.g., calling names and cursing); (d) self-injury (e.g., self-biting, skin picking, head punching, head butting, pica); (e) stereotypy (repetitive) (self-stimulatory behavior); (f) noncompliance and defiance, tantrum and disruption (Horner, Diemer, & Brazeau, 1992); and (g) unawareness of social boundaries and personal space (Heyvaert, Maes, & Onghena, 2010). These behaviors are considered major barriers to the social and educational development of children (Emerson et al., 2001). Social unawareness of boundaries, however, may not be a concern unless the behavior is intense and frequent (Heyvaert, Maes, & Onghena, 2010).

Factors Related with Incidents of Challenging Behaviors

Previous studies have suggested that children with limited communication and social skills use challenging behaviors to communicate with others (Borthwick-Duffy et al., 1996; Koegel, Koegel, & Surrat, 1992; Sigafoos, Arthur, & O'Reilly, 2003). Chiang (2008) examined the use of challenging behaviors as a communication tool in Australian and Taiwanese children with ASD who had limited communication skills in natural school settings. The researchers found that a significant number of these children used challenging behaviors to communicate across various classroom settings and activities. Furthermore, Horner et al. (2002) proposed that challenging behaviors are common among children with disabilities. Additionally, Horner and colleagues suggested that once challenging behaviors were established as part of a child's behavioral repertoire, they were difficult to control without a suitable intervention.

Holden and Gitlesen (2006), in their study on challenging behavior in Norway, found a prevalence of 11.1% of people with mental disorders. However, in this study, challenging behavior was independent of gender of the participants. Nevertheless, challenging behavior was associated with age and increased as the severity of mental retardation increased. One third of the study participants had less communication and social skills. In addition, this study proposed that communication deficits and severe intellectual disability were some of the factors that consistently predicted decreased effectiveness in the treatment of challenging behaviors. Additionally, they found that age was not an influencing factor as a decline in the occurrence of challenging behaviors at older age was not correlated to any incidents at a younger age.

Murphy, Healy, and Leader (2009) assessed the factors associated with the occurrence of challenging behaviors among children with ASD in Ireland. Although over 82% of the study participants had challenging behavior, age was not found to be a factor. Other factors such as level of intellectual functioning and type of intervention given were not associated with the prevalence of challenging behavior. Further, the study compared the frequency of challenging behavior with the level of intellectual disability, gender, age, type, and duration of intervention received. The results of their study indicated that the level of intellectual disability, type, and duration of intervention received are factors that have a positive influence on the challenging behavior.

A prevalence rate of 10-15% has been established on challenging behaviors among individuals with intellectual disabilities (Holden & Gitlesen, 2006). Several factors have been correlated with challenging behaviors in individuals with ASD. Holden and Gitlesen (2006), in their study investigating the specific factors associated with the presence of challenging behaviors, acknowledged that individuals with a diagnosis of ASD are at more risk for

developing challenging behaviors. Given that the disorder is associated with social and communicative deficits, the study results are not surprising. According to Baghdadli, Pascal, Grisi, and Aussilloux (2003), 50% of their 222 study participants experienced self-injurious behaviors and 14.6% experienced *severe* self-injurious behaviors. A number of child characteristics have been implicated in relation to factors associated with challenging behavior.

Powell et al. (2006) also found that challenging behaviors persisted when they were not identified and treated during early years. These behaviors resulted in poor academic performance and social maladjustment (Powell et al., 2006). A significant amount of attention has begun to focus on the early identification and treatment of challenging behaviors (Powell et al., 2006). Further, Powell et al. discussed types and various categories of challenging behaviors that children demonstrated from birth onwards and found models of interventions that showed significant results.

Another study conducted by Moss et al. (2000) assessed the prevalence of challenging behavior through associated variables. The study results indicated that 10-15% of the participants with mental retardation had challenging behaviors. Individuals with severe challenging behaviors had restricted expressive and receptive communication. Age and gender were important factors as about one third of the participants with problem behavior were male and two thirds of them were adolescents.

Murphy, Healy, and Leader (2009) assessed the factors associated with the occurrence of challenging behaviors among children with ASD in Ireland. Over 82% of the study participants had challenging behavior; however, age was not found to be a factor. Other factors such as level of intellectual functioning and type of intervention given were not associated with the prevalence of challenging behaviors. Further, the study compared the frequency of challenging behaviors

with the level of intellectual disability, gender, age, type, and duration of intervention received. Results indicated that 64.3% (n = 101) of the participants showed challenging behaviors, with a high occurrence across categories of behavior. The study findings indicated no correlation between age and gender as well as the presence of challenging behaviors. The study results in relation to level of intellectual disability, type, and hours of intervention received were all positive factors influencing challenging behaviors.

Challenging behaviors have been shown to be common among children with ASD and several factors have been shown to correlate with them. These factors may influence the severity of challenging behaviors in children with ASD. Some of these factors include age, gender, and country differences among children with ASD (Chung et al., 2012). Other factors have been thought to influence challenging behaviors in children with ASD, including demographic factors that have strong evidence supporting their relation to challenging behaviors in children with ASD (Murphy, Healy, & Leader, 2009). However, other factors such as cultural differences have not been widely explored. To examine cultural differences, most researchers have focused on looking a specific geographical region and assessing challenging behaviors in children with ASD in the region. However, not much research has been conducted to compare different countries or cultures to determine the differences in challenging behaviors in children with ASD in different areas. Nevertheless, a few studies have compared differences among different countries. For example, Matson (2011) compared differences between Israel, South Korea, the United Kingdom, and the United States, and the findings supported cross-cultural differences between countries in ASD symptoms. Cultural differences have also been shown to influence behavioral presentation and development in children. There is clear variable prevalence in rates across

different countries; however, due to the use of different methodologies, it is difficult to compare cultural differences on challenging behaviors among children with ASD (Chung et al., 2011).

In conclusion, it is evident that several factors which correlate to challenging behaviors in individuals with ASD exist. These factors have been shown to have differences based on country, gender, and age among children with ASD.

Function of Challenging Behaviors

Tarbox et al. (2009) stated that the function of a behavior refers to the environmental reinforcement source for that specific behavior. There are several common sources of environmental reinforcement for specific challenging behaviors that include self-stimulatory, escaping task demands, accessing preferred items, and seeking attention from others (Hanley, 2003). The four common functions of the behavior are: (a) attention, (b) escape, (c) sensory, and (d) tangible activities (Low & Webster, 2016). According to Cooper, Heron, and Heward (2007), individuals engage in a certain behavior to get social attention or reaction. This attention increases the frequency of their future behaviors. For example, a child may engage in challenging behavior such as cursing or elopement in order to obtain a reaction from the individuals around them. Additionally, Miltenberger (2008) argued that many challenging behaviors occur because individuals want to avoid the task or the environmental setting. Giving an individual a chance to escape one time may increase the frequency of future occurrences of the behavior (Williams, 2018). Furthermore, efforts should be made to limit an individual's exposure to aversive sensory stimuli (O'Neill et al., 1997). For example, an individual might get irritated from a sensory input such as the touch form a cloth. Moreover, some individuals engage in acts of self-stimulation which can be internally pleasing to them (O'Neill et al., 1997). Individuals have been shown to engage in certain behaviors to obtain a tangible item, access a

desired or preferred activity, or gain social attention from other people (Cooper et al., 2007).

O'Neill et al. (1997) shared that individuals engage in certain behaviors because it serves a

specific desirable function for them. It is also important to note that a behavior may serve more

than one function (Miltenberger, 2008).

Research has indicated that accurate identification of the function of challenging

behaviors is essential in informing and designing effective treatments for challenging behaviors

across children with ASD and other disabilities (Hong, Dixon, Stevens, Burns, & Linstead,

2018). A key tool in identifying the function of challenging behaviors is the Functional Analysis

Assessment (Iwata et al., 1982, 1994). The Functional Analysis Assessment is designed to

identify the function of behaviors through the systematic testing of behavioral occurrences such

as escape, access, attention, alone/automatic reinforcement, and play conditions (Iwata et al.,

1982, 1994). Careful analysis of data collected across the given conditions indicated that it is

possible to determine the primary function or reason a behavior is emitted (Iwata et al., 1982).

This study aimed at identifying the differences between the functions of challenging behaviors

that teachers and parents have observed, such as gaining attention, avoiding or escaping a task or

environment, getting sensory input, self-stimulation, and requesting a tangible item, in children.

Strategies Utilized to Decrease Challenging Behaviors

Fifty-four evidence-based strategies listed in *Behavior Interventions in Response to*

Instruction and intervention (Rti2) Model Handbook (2011) were used in creating a survey that

measured the differences in how parents and teachers report using evidence-based strategies to

decrease challenging behaviors. These 54 evidence-based strategies used in this study are listed

in Table 1.

Table 1

Evidence-Based Strategies Listed in Behavior Interventions in Response to Instruction and Intervention (Rti2) Model Handbook

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Stimulus-based procedures

1. Making adaptations and modification to make task easier/more fun
2. Reducing the number of people who are required to work together
3. Pairing for support with an appropriate model
4. Providing a self-monitoring checklist at home/school
5. Encouraging a child to express or verbalize feelings
6. Creating a safe environment where a child can make mistakes
7. Encouraging communication
8. Giving high fives
9. Reducing over stimulating distractions

Instructional-based Procedures

10. Both parents and teachers collaborate to change assignments to assist a child's learning
11. Providing a choice of activities within a task or completion of a project
12. Breaking assignments into segments
13. Checking a child's work to assess comprehension
14. Alternating tasks/assignments
15. Providing opportunities to be involved such as taking responsibilities/jobs both at home and school
16. Providing frequent turns
17. Providing multisensory (audio, visual, tactile, etc.) instructional strategies
18. Providing rules and guidelines to a child for the items which may create dispute
19. Providing a visual schedule
20. Using a visual prompt
21. Using a verbal prompt
22. Using physical prompts
23. Giving immediate and frequent feedback on positive behavior
24. Providing correction calmly, immediately and respectfully
25. An adult walking away rather than engaging in a power struggle
26. Allowing stretch breaks

Extinction-based Procedures

27. Limiting number of "escapes" or number of times they can avoid a task per day
28. Providing an opportunity to a child to avoid or escape a task
29. Reinforcing positive effortful behavior
30. Teaching strategies such as breathing/relaxation to reduce stress
31. Encouraging appropriate attempts for attention

Reinforcement Procedures

32. Giving permission to a child to move away from non-preferred person
33. Allowing a child to stand and work
34. Allowing "wiggle cushion," heavy rubber bands, "squish balls," weighted lap pad, tilted chair, slant board, bean bag chairs
35. Acknowledging the sensory need when asked appropriately
36. Allowing children to go to quiet area
37. Talking to children about change in the plan and possible emergency change in plans
38. Allowing the children to move toward desired element such as light, heat, good smell
39. Providing opportunities for preferred sensory stimulation such as music, object while staying on task
40. Providing access to preferred item to hold while completing a task
41. Providing snacks
42. Providing motivating activities to choose from when bored/overwhelmed
43. Acknowledging appropriate requests for items
44. Having more than one preferred choice from which to select
45. Keeping distracting items out of sight

Punishment Procedures

46. Providing a child/student waiting time before making another request
47. Allowing a child to adjust seats, positions if needed for sensory reasons

System Change Procedures

48. Intentionally Ignoring child when showing tantrums or crying
49. If appropriate, allowing children to work alone
50. Rewarding a child to complete non-preferred task
51. Prompting for help prior to a stressful situation
52. Using socially active peers who speak clearly, use eye contact and observe appropriate distance, to model and reinforce appropriate behavior
53. Using a timer to set for short periods
54. Providing positive attention such as praise and acknowledgement

Reviews and meta-analyses based on previous studies have indicated the effectiveness of the use of one-on-one interventions for challenging behaviors (Montgomery et al., 2014). Much of the research related to challenging behaviors has engaged single-subject design strategies to study multicomponent, instructional, and function-based interventions (Conroy et al., 2005).

Conroy et al. (2005) focused on positive strategies that reduced challenging behaviors for young children under the age of 6. These strategies included antecedent interventions, such as providing individuals with a choice, instructional interventions such as using Picture Exchange Communication Systems (PECS), self-monitoring interventions in which the individuals self-manage and monitor their own behavior, functional assessment-based interventions in which functions of the behaviors are replaced for example escaping a task, and multicomponent interventions which more than one component is implemented. Conroy et al. (2005) found that caregivers, such as teachers and family members, primarily serve as the intervention agents who implement strategies in various environmental settings to reduce the behavior. Additionally, Machalicek and colleagues (2007) stated that all types of interventions utilized for challenging behaviors such as antecedent manipulation, changing instructional context, differential reinforcement, and self-management strategies were effective in decreasing challenging behaviors in in school settings.

There is a relative gap in the field's understanding of differences in the types of strategies generally utilized by parents and teachers to address challenging behavior. Such information is critical because it is integral that a relationship be formed between parents and professionals in order to develop and implement an effective behavior plan (Chai & Lieberman-Betz, 2016). Noonan and McCormick (2014) argued that family-centered practices that provide information to families of children with special needs are essential so that they can make the right choices and stay involved as agents in the decision-making process. Teachers who involve families in their strategies increase the likelihood of effective implementation of strategies that bring about positive outcomes for children (Chai & Lieberman-Betz, 2016). Moreover, Chai and Lieberman-Betz (2016) argued that when professionals recognize that parents provide valuable information

during their process of making a behavior support plan, this can serve as an effective means in the child's life.

Horner and colleagues (2002) examined interventions utilized for challenging behaviors in children diagnosed with ASD. The authors reviewed articles published from 1988 to 2000 and the original research published between 1996 and 2000. The behaviors that were targeted most often in the published research were aggression, destruction, disruption, self-injury, and stereotypy (Horner at el., 2002). Additionally, the results of the review indicated that stimulus/antecedent-based or instructional-based intervention was utilized from 1990-2000. The purpose of an antecedent-based intervention is to change the environmental condition, which prompts an individual to engage in a behavior before the challenging behavior occurs. However, studies conducted prior to 1990 utilized consequence-based interventions which altered behavior using techniques, such as reinforcing the behavior after it occurred to increase the future frequency of the positive behavior (Horner et al., 2002). The results also revealed that the interventions conducted for children prior to 8 years old reduced challenging behaviors by 80-90%. Additionally, interventions based on prior functional assessment were demonstrated to be significantly effective (Horner et al., 2002). Functional assessment interventions analyze the cause and function of inappropriate behavior and then replace it with effective skills, after assessing the function of it.

Similar to the above-mentioned reviews, Matson and Lovullo (2008) examined treatments utilized for challenging behaviors, such as self-injurious behaviors, in individuals with ASD. The results indicated that behavior-based treatments such as choice making, assessing environmental factors, and training (requesting for an item) and replacement behaviors were effective in reducing challenging behaviors. However, the authors suggested that when positive

reinforcement, such as altering the environment and giving choices did not seem to provide effective results, medication and pharmacotherapy were utilized to reduce challenging behaviors.

Moreover, Brosnan and Healy (2011) studied interventions utilizing manipulation of an antecedent, known as antecedent-based strategies, which manipulates changes occurring before the challenging behavior. Moreover, consequence-based strategies utilize changes that happens after the behavior, for example, providing verbal praise for socially acceptable behavior after it has occurred (Meadan, Ayvazo, & Ostrosky, 2016). Brosnan and Healy (2011) used manipulation in antecedents to decrease aggression in individuals with intellectual disabilities. The results of all interventions were demonstrated to be effective. Research has indicated that prior to selecting and administering interventions, utilization of functional assessment has shown a significant reduction in aggressive behavior.

Furthermore, Harvey, Boer, Meyer, and Evans (2009) conducted a similar review on the articles utilizing interventions for challenging behaviors for individuals with intellectual disabilities. The results of their study revealed that teaching replacement skills combined with either systems change (e.g., the environmental changes) or antecedent/consequence manipulation demonstrated significant results. Additionally, a more significant result was demonstrated when interventions were initiated with assessment and functional analysis than those interventions that did not have any pre-assessments. Harvey and colleagues also found that different interventions seemed to work better for different behaviors. Changing antecedents, for example, successfully reduced destructive and behaviors that result in self-harm. Additionally, changing consequences creates an average effect in increasing social behaviors. Skill replacement strategies indicated a slight effect when utilized for challenging behaviors such as stereotypy, object destruction, self-

injury, and socially inappropriate social behaviors. System change intervention, such as changing

the patterns in the system or routine, has also been demonstrated to produce a moderate effect.

Additionally, Heyvaert and colleagues (2010) conducted a meta-analysis study which

examined 30 studies utilizing pharmacological, psychotherapeutic, and contextual interventions

to treat challenging behaviors for individuals with intellectual disabilities. The results of the

meta-analysis conducted on 80 potential articles demonstrated that only 30 articles had sufficient

data to support statistical meta-analysis. The summary of the results of the meta-analysis effect

size was strong for the 30 studies with sufficient data. However, individual characteristics of the

participants produced variations in response to the treatment implemented. Furthermore, Matson

and Nebel-Schwalm (2007) argued about the little work conducted on the assessment of

challenging behaviors, such as recording and measuring rate and intensity, and identifying

setting events and other variables. Continuous research in the field has shown signs that

sometimes challenging behaviors are exhibited due to the inability of communication and social

interaction. Therefore, in early inclusive childhood settings, when children diagnosed with ASD

have difficulties with communication and social interactions, they sometimes communicate

through challenging behaviors (Barned et al., 2011; Vakil, Welton, O'Connor, & Kline, 2009).

Snell, Berlin, Voorhees, Stanton-Chapman, and Hadden (2012) indicated that teachers

have consistently reported that it is difficult to manage challenging behaviors and that identifying

strategies to manage behaviors should be a high priority. Additionally, Hart and Whalon (2013)

underscored the importance of teachers providing opportunities for all children with and without

ASD to learn new skills, as it helps to reduce challenging behaviors.

Studies have indicated that stereotypy, repetitive, and self-stimulatory behaviors that are

targeted by researchers are reduced using functional assessment-based strategies (Horner et al.,

2002; Montgomery et al., 2014). Functional-based strategies include defining challenging behaviors, identifying the source that triggers the behavior and maintains it, and ultimately using the information to implement appropriate strategies (Montgomery et al., 2014; Stichter, 2001). Montgomery et al. (2014) listed stimulus-based, instructional-based, extinction-based, reinforcement-based, punishment-based, system change, and other interventions as common tools to reduce challenging behaviors.

Stimulus-based procedures. According to Montgomery et al. (2014), stimulus-based procedures involve altering antecedent events and using motivating operations, stimulus fading, stimulus discrimination training (Horner et al., 2002), and classical conditioning (Weiss, 2014). Horner and colleagues (2002) summarized research on behavioral strategies that included stimulus-based procedures for children with autism who were 8 years or younger; these studies were published between 1996 and 2000. The analysis included new areas discovered in the field of technology to support challenging behaviors, existing research on behavioral strategies, and results to develop strategies to modify behaviors for children with autism. This study recommended the need for more research on the development of behavioral interventions in children with ASD that are effective. The study further indicated that advancing behavioral technology also plays an important role in meeting the needs of children with ASD.

Instructional-based procedures. Instructional-based interventions (Royer et al., 2017) include teaching appropriate behaviors such as time on task, accuracy and fluency that, prior to the implementation, demonstrated very low frequency. Royer and colleagues conducted a review of literature to support academic commitment and reduce challenging behaviors. The review examined evidence regarding instructional choice, a low-intensity, teacher-delivered interventions implemented with school-aged children in school settings. The results of the review

demonstrated that providing instructional-based strategies increased expectations about the desired level of educational performance while decreasing occurrences of challenging behavior (Royer et al., 2017). This consisted of prompted communication and self-management exercises (Montgomery et al., 2014).

Extinction-based procedures. Extinction-based procedures are designed to withhold or decrease the delivery of reinforcers following challenging behaviors to reduce the frequency of that behavior (Horner et al., 2002). Research has demonstrated that when a behavior that was previously reinforced is no longer reinforced, it will decrease or cease to occur (Scotti et al., 1991). Extinction-based strategies can be used for challenging behaviors such as noncompliance, aggression, and self-injury. Planned ignoring a child is a common form of an extinction-based strategy to reduce challenging behaviors (Scotti et al., 1991).

Reinforcement procedures. Reinforcement procedures are designed to increase or maintain the frequency of the desired behaviors through contingent reinforcement delivered during the events and occurrence of desired behaviors (Horner et al., 2002). For instance, multiple reinforcement schedules have been utilized to teach stimulus control by indicating to the students when reinforcement is available or not available depending on an appropriate response (Torelli, Lloyd, Diekman, & Wehby, 2017). Token systems and non-contingent reinforcement are other forms of reinforcement procedures (Horner et al., 2002; Montgomery et al., 2014). A token system is used to give positive reinforcement to children who engage in desirable behaviors or complete a given task. The tokens are exchanged at a specific time with back-up reinforcers. On the other hand, non-contingent reinforcement is the use of reinforcers based on a time schedule an example being attention in class (Newcomb, & Hagopian, 2018). In a study conducted in 2017, Fritz and colleagues studied the effects of non-contingent reinforcement to

decrease challenging behavior, which was maintained by social positive reinforcement. Five individuals with ASD were selected to participate in this study. Results of the study indicated that an instant decrease in the challenging behaviors exhibited by all participants during continuous non-contingent reinforcement. The findings also demonstrated that challenging behaviors maintained at low levels during non-contingent reinforcement thinning for three participants.

Punishment procedures. Punishment procedures are designed to reduce challenging behaviors utilizing delivery of contingent negative events immediately following the occurrence of the challenging behaviors (Horner et al., 2002). Punishment refers to the use of a stimulus which is delivered contingent to a certain response. It leads to a decrease in the probability of a future occurrence of the response. This procedure includes time-outs, overcorrection, reprimands (reprimand is a severe or formal talking by a person of power), and response cost (Horner et al., 2002; Montgomery et al., 2014). Research has suggested that punishment should be delivered together with other reinforcement-based strategies so that behavior-decreasing mechanisms are not the only ones in effect. This is because punishment, if used for a long time, leads to negative effects which not always desirable (Horner et al., 2002). There has also been reported inconsistencies in the use of punishment. Rush, Crockett, and Hagopian (2001) studied the impact of the use of a combination of punishment and non-contingent reinforcement. They found that when the two were combined, there was sufficient reduction in problem behavior than when non-contingent reinforcement was used alone. They also learned that punishment did not decrease the positive effects in any notable manner.

System change procedures. Montgomery et al. (2014) discussed system change as an intervention utilized to decrease challenging behaviors. This type of intervention is designed to

alter structural and environmental features, including staffing pattern, and alter outcomes utilized to assess success in reducing target behaviors (Horner et al., 2002). The review also revealed several interventions that were not described with sufficient detail to determine its effectiveness (Montgomery et al., 2014).

Montgomery et al. (2014) reviewed 38 articles that discussed interventions aiming to decrease challenging behaviors. The review consisted of 35 studies conducted primarily in United States. Three other articles selected were from the United Kingdom, Ireland, and Australia. Twenty-six articles focused on behavior interventions and six focused on ASD and intellectual disabilities. The other areas of study were social work (1 study), therapy (2 studies), and education (3 studies) (Montgomery et al., 2014). Reviews conducted on challenging behaviors identified 68 participants (56 males and 12 females) (Montgomery et al., 2014). The ages of the participants ranged from 3-21 years, with the mean recorded as 8.4 years and standard deviation recorded as 3.8. Ages of the participants are not specified in various studies (Glaeser, Pierson & Fritschmann, 2003; Johnson, Van Laarhoven, & Repp, 2002; Montgomery et al., 2014). However, some articles reported the ages of the participants (Glaeser et al., 2003; Johnson et al., 2002). The primary diagnosis in Montgomery and Colleagues (2014) reviewed articles were of ASD (74.1%), ID (15.7%), Asperger's Disorder (4.3%), Pervasive Developmental Disorder Not Otherwise Specified (4.3%), and developmental disorders (4.3%).

Evidence-based Strategy Use in Home and School Contexts

Webster-Straton and Taylor (2001) found a relationship between the challenging behaviors and the use of harsh and punishment strategies to discipline children in home settings. Further, the authors argued that these strategies utilized at home to reduce behaviors can lead to increasing stressful and challenging interaction between parents and children (Webster-Stratton

& Taylor, 2001). Moreover, Powell et al. (2006) stressed the utilization of materials to help establish consistent management routines to create a positive interaction between the parents and children. These strategies will help parents to interact with children to foster healthy social and emotional development (Powell et al., 2006). Furthermore, research has indicated that when parents utilize social problem-solving and modeling strategies, they significantly encourage positive behaviors such as empathy for others, self-regulation, and friendship (Powell et al., 2006). Moreover, research findings have indicated that families who receive information from health care professionals and teachers to support the growth of their children minimize the probability of developing challenging behavior (Powell et al., 2006).

In the school context, it has been revealed that when teachers deliberately and proactively implement strategies in their classrooms, they help prevent and reduce challenging behaviors in students (Powell et al., 2006). Additionally, preparation such as arranging the room, classroom routines, schedules, and positive child and teacher interactions help create a positive environment (Powell et al., 2006). When classrooms are well designed to provide comfort, positive interactions between teachers and students as well as between children and their peers can be created and fostered (Powell et al., 2006). Research has also indicated that when children see consistent classroom schedules, routines, and activities, they are less likely to demonstrate challenging behaviors (Powell et al., 2006). It is important to respond to minor inappropriate conduct and positively reinforce appropriate behavior for the purpose of reducing challenging behaviors (Powell at el., 2006). Furthermore, it should be noted that when children are delivered clear directions which are given positively, a child will contribute and comply (Powell et al., 2006). Additionally, when children's behaviors are monitored and redirected, escalation of challenging behaviors can be prevented (Horner et al., 2002; Powell et al., 2006).

Researchers and clinicians have indicated that teachers should be aware of the classroom routines when interested in treating challenging behaviors (Horner et al., 2002; Powell et al., 2006). Generally, in experimental setting conditions, common classroom distractions are controlled. However, unpredictable activity transitions and distractions are present in real-life settings (Powell et al., 2006). Additionally, research has argued that the age and number of the children receiving interventions in the classroom should be considered as unexpected difficulties may arise when applying strategies that may have previously worked (Horner et al., 2002; Powell et al., 2006).

According to Machalicek and colleagues (2007), schools have been held responsible for the treatment of the challenging behaviors of children with disabilities for two reasons. First, the staff is trained at the school to implement intervention. Second, the Individuals with Disabilities Education Act (IDEA) requires making a functional behavior assessment to identify the variables that maintain challenging behavior. This assessment ultimately helps teachers develop a behavioral intervention plan (BIP) for students who demonstrate challenging behaviors (Mchalicek et al., 2007).

The current study was conducted to investigate the functions of the challenging behaviors across home and school environments reported by parents and teachers of children with or without ASD. It also examined the differences between parents and teachers in the use of evidence-based strategies to deal with challenging behaviors of children with or without ASD. Additionally, the study explored variables such as gender, age, country, and diagnosis of ASD for whether they are predictive of functions of challenging behaviors reported by parents and teachers. A few studies have been carried out to investigate parents' (O'Nions et al., 2017) and teachers' (Royer et al., 2017) methods to manage challenging behaviors. O'Nions et al. (2017)

explored through a meta-analysis strategy that parents use in the management of challenging behavior in children with ASD and various approaches were investigated. The findings indicated that there were complex parenting demanded to address challenging behavior for children with ASD. Royer et al. (2017) conducted a systematic review of strategies to decrease challenging behaviors in schools. The study findings indicated that the provision of students with instruction choices decreases instances of disruptive behavior but increases the desired academic behavior. However, there has been no evidence in the literature of differences in the implementation of evidence-based strategies and the identification of the function of challenging behaviors as reported by parents and teachers of children with or without ASD.

Summary of Literature Review

The literature discussed in this chapter is on functions of challenging behaviors and strategies utilized in dealing with challenging behaviors in young children aged 2 to 10 years with and without Autism Spectrum Disorder (ASD). These behaviors were shown to jeopardize children's growth in various domains, and have implications for their functioning at home as well as in school (Doubet & Ostrosky, 2015). The analysis of the literature revealed that challenging behaviors are a common concern for children with and without disabilities. Among children with disabilities, challenging behaviors are a particular concern for children with ASD which is the group that this study focused on. The factors related with incidents of challenging behaviors identified several factors for example social and communicative deficits, self-injurious behaviors, and severe intellectual disability which have been correlated with challenging behaviors in individuals with ASD. Challenging behaviors were found to be frequent concern for parents as well as teachers of children with ASD since it is common for these children to behave

differently at school and at home. It was discovered that challenging behaviors in children with

ASD serve various functions. Examples of the functions included as an indicator of boredom,

attention seeking, confusion about a task they are meant to perform, discomfort for a child in the

environment, or difficulty in communicating their needs. A review of interventions utilized to

decrease challenging behaviors indicated that numerous strategies that teachers and parents of

children with autism spectrum disorder (ASD) have utilized to decrease challenging behaviors.

Challenging behaviors have been shown to persist in children with ASD who do not receive

appropriate interventions.

Based on the literature review, it was established that most of the research in this area of

the functions of challenging behaviors in children with ASD was based on single-case studies or

had small research samples, which failed to indicate significant effects. In addition, only limited

research has described the differences between teachers and parents in identifying the functions

of challenging behaviors in children with and without ASD and the strategies used by teachers

and parents to decrease challenging behaviors of children with and without ASD.

The current study was therefore conducted to investigate the functions of the challenging

behaviors across home and school environments as reported by parents and teachers of children

with or without ASD. It also examined the differences between parents and teachers in the use of

evidence-based strategies to deal with challenging behaviors of children with or without ASD.

Additionally, the study explored the variables such as gender, age, country, and the diagnosis of

ASD to determine if they were related to functions of challenging behaviors reported by parents

and teachers.

Research Questions

Research Question 1: What are the differences in the functions of challenging behavior between home and school environments?

Hypothesis 1: Children with or without ASD display different functions of challenging behavior in home and school environments as reported by parents and teachers. This hypothesis is based on the findings by Attwood (1997), who indicated that it is very common for children with ASD to behave differently at school and at home. This character type has been referred to as "Jekyll and Hyde" (Attwood, 1997).

Research Question 1-1: Are there differences in the functions of challenging behavior displayed by children with ASD between home and school environments as reported by parents?

Research Question 1-2: Are there differences in the functions of challenging behavior displayed by children with ASD between home and school environments as reported by teachers?

Research Question 1-3: Are there differences in the functions of challenging behavior displayed by children without ASD between home and school environments as reported by parents?

Research Question 1-4: Are there differences in the functions of challenging behavior displayed by children without ASD between home and school environments as reported by teachers?

Research Question 2: What are the differences in parents' and teachers' reports of the functions of challenging behavior?

Hypothesis 2: Children with or without ASD display different functions of challenging behavior displayed at school as reported by parents and teachers. This hypothesis is supported by the findings by Keenan and Wakschlag (2000), who expressed that children

exhibit different challenging behaviors both at home and school environments. Further, teachers are thought to have different responses form the parents because they are trained to make a functional behavior assessment for the identification of the variables that maintain challenging behavior (Mchalicek et al., 2007). This assessment ultimately helps the teachers to develop a more detailed and elaborate behavioral intervention plan (BIP) for students who demonstrate challenging behavior (Mchalicek et al., 2007).

Research Question 2-1: Are there differences between parents' and teachers' reports of the functions of challenging behavior displayed by children with ASD at school?

Research Question 2-2: Are there differences between parents' and teachers' reports of the functions of challenging behavior displayed by children with ASD at home?

Research Question 2-3: Are there differences between parents' and teachers' reports of the functions of challenging behavior displayed by children without ASD at school? '

Research Question 2-4: Are there differences between parents' and teachers' reports of the functions of challenging behavior displayed by children without ASD at home?

Research Question 3: What are the differences in the functions of challenging behavior by children with ASD and children without ASD?

Hypothesis 3: The functions of challenging behavior differ in children with or without ASD. This hypothesis is supported by the findings that Children with ASD exhibit many challenging behaviors unlike children without ASD. Given the pervasive nature of autism and its effects on children both at home and at school, it is important to understand how the functions of functions of challenging behavior differ in children with or without ASD.

Research Question 3-1: Are there differences in the functions of challenging behavior displayed by children with ASD and children without ASD at school as reported by parents?

Research Question 3-2: Are there differences in the functions of challenging behavior displayed by children with ASD and children without ASD at school as reported by teachers?

Research Question 3-3: Are there differences in the functions of challenging behavior displayed by children with ASD and children without ASD at home as reported by parents**?**

Research Question 3-4: Are there differences in the functions of challenging behavior displayed by children with ASD and children without ASD at home as reported by teachers?

Research Question 4: Are there any differences in the use of evidence-based strategies to deal with challenging behaviors**?**

> **Hypothesis 4:** There are differences in the use of evidence-based strategies in dealing with challenging behaviors in children with or without ASD. Chai and Lieberman, (2016) indicated that both teachers and parents have used evidence-based strategies to decrease challenging behaviors. Powell et al. (2006) stressed the utilization of materials to help establish consistent management routines to create a positive interaction between the parents and children. Based on these findings, a difference exists in the use of evidence-based strategies at home and school setting.

Research Question 4-1: Are there differences between parents and teachers in the use of evidence-based strategies to deal with challenging behaviors of children with ASD?

Research Question 4-2: Are there differences between parents and teacher in the use of evidence-based strategies to deal with challenging behaviors of children without ASD?

Research Question 4-3: Are there differences in the use of evidence-based strategies to deal with challenging behaviors of children with ASD and children without ASD by parents?

Research Question 4-4: Are there differences in the use of evidence-based strategies to deal with challenging behaviors of children with ASD and children without ASD by teachers?

Research Question 5: Are gender, age, country, and the diagnosis of ASD predictive of functions of challenging behavior?

Research Question 6: Are gender, age, country, and the diagnosis of ASD predictive of the number of evidence-based strategies used by parents?

Research Question 7: Are gender, age, country, and the diagnosis of ASD predictive of the number of evidence-based strategies used by teachers?

Hypotheses 5, 6 and 7: Gender, age, and the diagnosis of ASD are variables that are predictive of functions of challenging behaviors reported by parents and teachers. This hypothesis is supported by the study by Murphy, Healy and Leader (2009) who discussed the factors associated with the occurrence of challenging behaviors and compared the frequency of these behaviors with the level of intellectual disability, gender, age, type and duration of intervention received. The study findings indicated that the level of intellectual disability, gender, type and duration of intervention received were all positive factors influencing challenging behaviors. Based on gender, females were shown to be less likely to use challenging behaviors to avoid or escape a task or environment at school as compared to boys. Age was not significant a significant factor exhibiting challenging behaviors.

Chapter III

METHOD

Participant Recruitment

An approval from the Institutional Review Board (IRB) was obtained from Teachers

College, Columbia University prior to the start of the study. The IRB protocol number allocated

to the study was 17-228 (see Appendix A). The participants were recruited through snowball

sampling and word-of-mouth, through school principals and organizations that serve special

education teacher and parent communities. The recruitment flyer (see Appendix B) was posted

on Twitter (@AnnaJaved5) and Facebook (Anna Javed) and the Teachers College bulletin board

to reach out to potential participants of this study.

Consent Procedure and Administration of Instruments

The consent form (see Appendix C) was posted on SurveyMonkey. Parents and teachers

were required to sign the consent forms prior to participating in this study. The consent form

preceded the survey. The participants were instructed to fill out the survey on SurveyMonkey

once they provided their consent.

Participants

The participants of this study were teachers and parents of children with and without

ASD aged 2-10 years old. The inclusion criteria for this study included (a) parent of one or more

children with or without ASD, (b) teacher who has taught one or more students with or without

ASD, and (c) child/students aged between 2 and 10 years. A total of 784 individuals responded

to recruitment materials. A total of 238 respondents were excluded from analyses because they

did not agree to participate, did not meet inclusion criteria, and/or did not complete the survey.

Three participants responded "No" to "Do you agree to participate in this study?", 40

participants responded "No"" to "Do you meet the above qualifications?", and 195 participants

stopped responding after the question "Are you the child's mother, father, guardian, teacher or

other?" After excluding 238 respondents, 546 respondents remained and were grouped into three

categories: teachers, parents, and both teachers and parents of children with or without ASD.

Participants who were both teachers and parents (n = 58) were excluded from this study as the

research questions target population was just teachers or just parents of children with or without

ASD. The final sample of this study included a total of 251 teachers (51.5%) and 237 parents

(48.5%). The information of these participants was collected on SurveyMonkey and then

transferred to IBM® SPSS® Statistics Standard GradPack 24 for analyses.

Measures

The research design implemented for this study was a cross-sectional design utilizing an

Investigator Designed Survey that was implemented electronically using SurveyMonkey. The

Investigator-designed survey (see Appendix D) consisted of three sections: (a) demographics,

(b) functions of challenging behaviors, and (c) strategies used to address challenging behaviors.

Demographics

Participants' demographic information was collected in the first section. Specifically,

participants were asked to report on their relationship with the child (teachers/parents of children

diagnosed with ASD and without ASD), gender, age, diagnosis (children with ASD and without

ASD) and country.

Functions of Challenging Behaviors

In the second section, parents and teachers were asked to identify the functions of challenging behaviors exhibited by their child/student at home/school setting. The participants were asked to select the functions out of the options provided. Five functions were listed: (a) to gain attention, (b) to avoid or escape a task or environment, (c) to gain sensory input, (d) to receive self-stimulation, (e) to request a tangible item. There are many other functions; however, due to time and resources constraint, this study concentrated on these five functions. The participants were prompted to select all the functions that were relevant for their child and the situations they encounter with their child.

Strategies Used to Address Challenging Behaviors

The third section of the survey asked the participants to indicate the frequency in which they used each of 54 strategies (see these strategies in dependent variables in Table 1) to reduce their child or student's challenging behaviors. Response choices were reported using a 4-point Likert scale with the response choices: (1) often, (2) sometimes, (3) seldom and (4) never.

Dependent and Independent Variables

The independent variables in the study were gender, age, country, participant group (teacher vs. parent) and the diagnosis of ASD, whereas the dependent variables were the functions of the challenging behavior and 54 strategies listed to decrease the challenging behaviors (see Table 1).

Table 2

Independent Variables and Dependent Variables

Independent Variables	Dependent Variables

1. Gender
 	
2. Age
 	
3. Country
 	
4. Diagnostic group (with or without ASD diagnosis)
 	
5. Participant group (teacher vs. parent)
	1. Functions of challenging behavior:
	    a) to get attention,
	    b) to avoid or escape task or environment,
	    c) to get sensory input,
	    d) self-stimulation
	    e) to request a tangible item
	
	The sum of the strategies used to decrease challenging behaviors. The strategies used in this study, include:
	1. Both parents and teachers collaborate to change assignments to assist a child's learning
	2. Providing a choice of activities within a task or completion of a project
	3. Breaking assignments into segments
	4. Making adaptations and modification to make task easier/more fun
	5. Checking a child's work to assess comprehension
	6. Alternating tasks/assignments
	7. Giving permission to a child to move away from non-preferred person
	8. Ignore purposefully when showing tantrums or crying
	9. If appropriate, allowing to work alone
	10. Reducing the number of people who are required to work together
	11. Pairing for support with an appropriate model
	12. Provide a self-monitoring checklist at home/school
	13. Encourage a child to express or verbalize feelings
	14. Create a safe environment where a child can make mistakes
	15. Rewarding a child to complete non-preferred task
	16. Prompting to ask for help prior to a stressful situation
	17. Limiting number of "escapes" or number of times they can avoid a task per day
	18. Providing an opportunity to a child to avoid or

	escape a task
	19. Reinforcing positive effortful behavior
	20. Teaching strategies such as breathing/relaxation to reduce stress
	21. Encouraging appropriate attempts for attention
	22. Use socially active peers who speak clearly, use eye contact and observe appropriate distance, to model and reinforce appropriate behavior
	23. Timer to set for short periods
	24. Provide positive attention such as praise and acknowledgement
	25. Provide opportunities to be involved such as taking responsibilities/ jobs both at home and school
	26. Providing frequent turns
	27. Encourage communication
	28. Give high fives
	29. Immediate and frequent feedback on positive behavior
	30. Providing correction calmly, immediately and respectfully
	31. An adult walking away rather than engaging in a power struggle
	32. Provide a child/student waiting time before making another request
	33. Allowing a child to adjust seats, positions if needed for sensory reasons
	34. Allowing stretch breaks
	35. Allowing a child to stand and work
	36. Allowing "wiggle cushion", heavy rubber bands, "squish balls", weighted lap pad, tilted chair, slant board, bean bag chairs
	37. Acknowledge the sensory need when asked appropriately
	38. Allowing going to quiet area
	39. Reducing over stimulating distractions
	40. Talking to children about change in the plan and possible emergency change in plans
	41. Providing multi-sensory (audio, visual and tactile etc.) instructional strategies
	42. Allowing moving toward desired element such as light, heat, good smell
	43. Providing opportunities for preferred sensory stimulation such as music, object while staying on task
	44. Providing access to preferred item to hold while

	completing a task 45. Providing snacks 46. Providing motivating activities to choose from when bored/overwhelmed 47. Acknowledging appropriate requests for items 48. Having more than one preferred choice from which to select 49. Keeping distracting items out of sight 50. Providing rules and guidelines to a child for the items which may create dispute 51. Providing visual schedule 52. Using visual prompt 53. Using verbal prompt 54. Using physical prompts

Data Analysis

IBM® SPSS® Statistics Standard GradPack 24 for Windows for students was used for all statistical analyses. The data was exported from SurveyMonkey to Excel and from Excel transferred to IBM® SPSS® Statistics Standard GradPack 24 for Windows for students. Descriptive statistics were calculated for demographic information and the strategy used by parents and teachers of children with or without ASD to deal with challenging behaviors. Given that multiple comparisons were used in this study, a conservative p value < .01 was used throughout this study. Data analyses were conducted as follows:

Research Questions 1, 2, and 3

Descriptive statistics were used to investigate whether there were differences in parents' and teachers' reports in the five functions of challenging behavior.

Research Question 4

This research question was analyzed using independent *t*-test to determine the mean difference of the sum of strategies between parents and teachers in the use of evidence-based strategies to deal with challenging behaviors of children with ASD.

Research Questions 5, 6, and 7

These research questions were analyzed using regression analyses. Logistic regression was used for question number 5. The independent variables used to analyze the data were gender, age, country and diagnosis of ASD and the dependent variables used were the functions (e.g., to gain attention, to avoid or escape task or environment, to get sensory input, for self-stimulation and to request a tangible item) of challenging behaviors at home and school environmental settings. A multiple linear regression model was used for questions 6 and 7. The independent variables used were gender, age, country and diagnosis of ASD and the dependent variable was the sum of the evidence-based strategies utilized by parents and teachers to decrease challenging behaviors.

Chapter IV

RESULTS

Demographic Information of Participants

The final sample consisted of 488 respondents: 251 (51.5%) teachers and 237 (48.5%) parents completed the survey. Approximately 25.2 % of the children were female, while 67.6 % were males and 7.1% identified as other. The children ranged between 2 and 10 years of age; the average age was 6.5 years old. Primarily, 88.72% of the individuals who completed the survey were from the United States of America and 11.27% from other countries (e.g., India, Pakistan, Mexico, Canada, United Kingdom, and Ireland). Moreover, 67.4 % of respondents' (teachers/parents) children were diagnosed with ASD and 32.6% were respondents' (teacher/parents) children were without ASD.

Information about the participants' characteristics can be found in Table 3.

Table 3

Participants' Characteristics

Characteristic	N	%
Child's Gender		
Female	123	25.2
Male	330	67.6
Other	35	7.1
Country		
United States of America	433	88.72
Other	55	11.27
Child's/Student's Age		
2	27	5.5
3	45	9.2
4	64	13.11
5	56	11.47
6	53	10.86
7	47	9.6
8	57	11.68
9	53	10.86
10	86	17.6

Diagnosis
   With ASD   329   67.4
   Without ASD   159   32.6
Respondents
   Parents of Children with ASD   119   24.38
   Parents of Children without ASD   118   24.18
   Teachers of Children with ASD   210   43.03
   Teachers of Children without ASD   41   8.40

Research Question 1-1: Are there differences in the functions of challenging behavior displayed by children with ASD across home and school environments as reported by parents?

The functions of challenging behaviors displayed by children with ASD across home and school environments as reported by parents can be found in Table 4.

Table 4

Differences in the functions of challenging behavior displayed by children with ASD across home and school environments as reported by parents.

	Home only	School only	Not home or school	Both home and school
To get attention	28 23.5%	2 1.68%	58 48.73%	31 26.05%
To avoid or escape a task or environment	15 12.6%	10 8.4%	21 17.6%	73 61.3%
To get sensory input	9 7.5%	7 5.8%	46 38.6%	57 47.8%
Self-stimulation	9 7.5%	7 5.8%	66 55.4%	37 31.0%
To request a tangible item	20 16.8%	5 4.2%	64 53.7%	30 25.2%

Yes, there were differences in the functions of challenging behaviors displayed by children with ASD across home and school environments as reported by parents. Approximately half of the parents (48.73%) reported that their children did not use challenging behaviors to get

attention at home or school, whereas a low percentage (1.68 %) reported the use of this function only at school. More than half of parents (61.3%) reported that their children used challenging behaviors at home to avoid or escape a task/environment, whereas 8.4% of parents reported the use of this function at school. Additionally, about half of parents (47.8%) reported that their children did not use challenging behaviors to get sensory input at home and school for this function. However, a lower portion of the sample (5.8%) reported that their children use the function of sensory input when exhibiting challenging behaviors only at school. The majority of parents reported that their children did not use challenging behaviors at home or school (55.4%) for self-simulation, while smaller portions (5.8% and 7.5%) reported the use of this function at school only and home only. A similar pattern was observed in terms of using challenging behavior to request a tangible item, where 53.7% of parents reported that children did not use challenging behaviors for this function at home or school. Conversely, 4.2% of the parents reported that their children used this function at school only. It is notable that the highest percentage for each function can be found in the "home and school" environment, whereas the lowest percentage for each function could be found in the "at school only" environment across the data findings.

Research Question 1-2: Are there differences in the functions of challenging behavior displayed by children with ASD across home and school environments as reported by teachers?

The functions of challenging behaviors displayed by children with ASD across home and school environments as reported by teachers can be found in Table 5.

Table 5

Differences in the functions of challenging behavior displayed by children with ASD across home and school environments as reported by teachers.

	Home only	School only	Not home or school	Both home and school
To get attention	10 4.7%	72 34.3%	50 23.8%	78 37.2%
To avoid or escape a task or environment	6 2.8%	96 45.7%	18 8.7%	90 42.8%
To get sensory input	8 3.8%	60 28.5%	95 45.2%	47 22.4%
Self-stimulation	4 1.9%	52 24.76%	114 54.2%	37 17.6%
To request a tangible item	13 6.1%	44 20.9%	106 50.4%	47 22.38%

Yes, there were differences in the functions of challenging behaviors displayed by children with ASD across the home and school environments as reported by teachers. More than one-third of the teachers (37.2%) reported the use of challenging behaviors to get attention at home and school environments, while 4.7% of the teachers reported that children with ASD used this function to get attention only at home. A large proportion (34.3%) of teachers reported the use of challenging behavior to get attention only in school. As for the function of avoiding or escaping a task or environment, nearly half of children with ASD (45.7%) were reported to do so at only school, 42.8% reported both at home and school, whereas 2.8% of the teachers reported the use of this function only at home. In regards to the function of obtaining sensory input, almost half of children with ASD (45.2%) were reported as not using this function at home or school, while only 3.8% were reported to use this function at home by the teachers. Self-stimulation was not used at home or school for approximately 54.2% of children with ASD, however, 1.9 % of children were reported as using this function at home only. Lastly, 50.4% of children with ASD were reported as not requesting a tangible item as a function to exhibit challenging behaviors at home or at school, while 6.1% were reported to use this function only at home.

Research Question 1-3: Are there differences in the functions of challenging behavior displayed by children without ASD across home and school environments as reported by parents?

The functions of challenging behaviors displayed by children without ASD across home and school environments as reported by parents can be found in Table 6.

Table 6

Differences in the functions of challenging behavior displayed by children without ASD across home and school environments as reported by parents.

	Home only	School only	Not home or school	Both home and school
To get attention	31	7	46	34
	26.2%	5.9%	38.9%	28.81%
To avoid or escape a task or environment	34	5	35	44
	28.81%	4.2%	29.66%	37.28%
To get sensory input	9	4	84	21
	7.5%	5.8%	38.6%	47.8%
Self-stimulation	6	0	96	16
	5.0%	0%	81.35%	13.55%
To request a tangible item	22	2	80	14
	18,64%	1.6%	67.79%	11.86%

Yes, there were differences in the functions of challenging behaviors displayed by children without ASD across the home and school environments as reported by parents. Only 5.9% of parents reported that children without ASD used challenging behaviors to get attention at school only, while 38.9% reported that this function was not used either at home or at school. Additionally, 4.2% of the parents reported the use of the function to avoid or escape a task or environment at school only, whereas 37.28% reported to use of this function at both home and school environments. While 5.8 % of parents reported the use of the function to get sensory input at only school, 47.8% of the parents reported the use of this function when exhibiting challenging

behaviors both at home and school. While no parents in the sample (0%) reported the use of

challenging behaviors for self-stimulation at school, 81.35% of the parents reported use of

challenging behaviors for self-stimulation neither at school nor at home. Only 1.6% of the

parents reported the use of challenging behaviors to request a tangible item at school, while

67.79% of the parents reported the function to request a tangible item neither at school nor home.

Research Question 1-4: Are there differences in the functions of challenging behavior displayed

by children without ASD across home and school environments as reported by teachers?

The functions of challenging behaviors displayed by children without ASD across home

and school environments as reported by teachers can be found in Table 7.

Table 7

Differences in the functions of challenging behavior displayed by children without ASD across

home and school environments as reported by teachers.

	Home only	School only	Not home or school	Both home and school
To get attention	1	19	8	13
	2.4%	46.34%	19.5%	31.70%
To avoid or escape a task or environment	3	15	12	11
	7.3%	36.58%	29.26%	26.82%
To get sensory input	0	9	27	5
	0%	21.95%	65.85%	12.19%
Self-stimulation	0	3	34	4
	0%	7.3%	82.92%	9.7%
To request a tangible item	2	5	29	5
	4.8%	12.19%	70.73%	12.19%

Yes, there were differences in the functions of challenging behaviors displayed by

children without ASD across home and school environments as reported by teachers. Almost half

of children without ASD (46.3%) were reported by teachers as using challenging behaviors to get attention at school only, while 2.4 % of children did so only at home. When it came to avoiding or escaping a task/environment, 36.6% of children without ASD were reported as using this function at school only, and only 7.3% used this function at home. A sizeable majority of children (65.9%) were reported as not using challenging behaviors at home or at school to get sensory input and none of the teachers reported the use of this function at home environment. A large sample of teachers (82.9%) reported that the children did not use the function of self-stimulation to exhibit behaviors at home and school. None reported the presence of this function at home only. For requesting a tangible item, 4.8% teachers reported the use of this function at home only, while a majority of the sample (70.73%) reported using this function neither at school nor at home.

Research Question 2-1: Are there differences in the functions of challenging behavior displayed by children with ASD at school between parents' report and teacher's report?

The functions of challenging behaviors displayed by children with ASD at school as reported by parents and teachers can be found in Table 8.

Table 8

Differences in the functions of challenging behavior displayed by children with ASD at school between parents' report and teacher's report.

	Parent only	Teacher only	Neither teacher or parent	Both teacher and parent
To get attention	86	150	60	33
	26.13%	45.59%	18.23%	10.03%
To avoid or escape a task or environment	36	186	24	83
	10.94%	56.53%	7.29%	25.22%
To get sensory input	55	107	103	64
	16.71%	32.52%	31.30%	19.45%

Self-stimulation	75	92	118	44
	22.79%	27.96%	35.86%	13.37%
To request a tangible	84	91	119	35
item	25.53%	27.65%	36.17%	10.63%

Yes, there were differences between parents' report and teacher's report in the functions of the challenging behavior displayed by children with ASD at school. For the function of getting attention, only 10.03% of children were reported by neither their teachers nor parents to use this function of challenging behavior. Over half of children with ASD were reported by teachers only (56.53%) to use challenging behavior to avoid or escape a task/environment at school, while 7.29 % of children were reported by neither their teachers nor parents to use this function. Just under a third of children had only teachers (32.55%) reporting the use of getting sensory input, whereas a comparatively small portion (16.71%) of parents reported the use of this function. Neither parents nor teachers (31.30%) reported the use of getting sensory input as a function to exhibit challenging behaviors. For self-stimulation 35.86% of children were reported not to use this function to exhibit challenging behaviors by parents and teachers, while 13.37% of children with ASD were reported to use this function by both parents and teachers. About a third of children (36.2%) with ASD were reported not to use the function of requesting a tangible item to exhibit challenging behaviors. However, 10.63% of both parents and teachers reported the use of requesting a tangible item to exhibit challenging behaviors.

The results in Table 8 demonstrated that teachers of children with ASD seemed more likely than parents to report these children using challenging behaviors for all functions. The percentage of responses in the teachers' only category was higher across all five functions at school as compared to the parents' only category.

Research Question 2-2: Are there differences in the functions of challenging behavior displayed by children with ASD at home between parents' report and teacher's report?

The functions of challenging behaviors displayed by children with ASD at home as reported by parents and teachers can be found in Table 9.

Table 9

Differences in the functions of challenging behavior displayed by children with ASD at home between parents' report and teacher's report.

	Parent only	Teacher only	Neither teacher or parent	Both teacher and parent
To get attention	60	88	122	59
	18.23%	26.74%	37.08%	17.93%
To avoid or escape a task or environment	31	96	114	88
	9.42%	29.17%	34.65%	26.74%
To get sensory input	53	55	155	66
	16.10%	16.71%	47.11%	20.06%
Self-stimulation	73	44	166	46
	22.18%	13.37%	50.45%	13.98%
To request a tangible item	69	60	150	50
	20.97%	18.23%	45.59%	15.19%

Yes, there were differences in the functions of challenging behavior displayed by children with ASD at home between parents' report and teacher's report. While 37.08% of teachers and parents reported that their children did not challenging behavior to get attention at home, 17.93% reported that they used this function at home. Almost one-third of teachers and parents (34.65%) reported that their children did not use the function of avoiding/escaping a task or environment by children with ASD at home. However, a smaller proportion of parents 9.42% reported the use of this function at home. Almost half, 47.11%, of parents and teachers reported that children with ASD did not use the function of getting sensory input at home, while (16.71%)

parent reported use of this function to exhibit challenging behaviors at home. Just over half

(50.45%) of children were reported by both teachers and parents to not use challenging behavior

to get self-stimulation at home, while 13.98% fell into teacher only category to use this function

to exhibit challenging behaviors. Approximately 46% of children were not reported to use

challenging behavior at home to request a tangible item, leaving 15.19% of both children that

were reported by both teachers and parents to use this function at home.

Research Question 2-3: Are there differences in the functions of challenging behavior displayed

by children without ASD at school between parents' report and teacher's report?

The functions of challenging behaviors displayed by children without ASD at school as

reported by parents and teachers can be found in Table 10.

Table 10

Differences in the functions of challenging behavior displayed by children without ASD at school

between parents' report and teacher's report.

	Parent only	Teacher only	Neither teacher or parent	Both teacher and parent
To get attention	77	32	9	65
	42.08%	17.49%	4.91%	35.52%
To avoid or escape a task or environment	69	26	15	49
	43.39%	16.35%	9.43%	30.81%
To get sensory input	93	14	27	25
	58.49%	8.80%	16.98%	15.72%
Self-stimulation	102	7	34	16
	64.15%	4.40%	21.38%	10.06%
To request a tangible item	102	10	31	16
	64.15%	6.28%	19.49%	10.06%

Yes, there were differences in the functions of challenging behavior displayed by

children without ASD at school between parents' report and teacher's report. The result in Table

10 demonstrated that a large portion of parents of children without ASD reported their children use challenging behavior to gain attention (42.08%), whereas on the other hand a small percentage of teachers and parents 4.91% reported that the children without ASD did not use this function to exhibit challenging behaviors. For the function to avoid or escape a task or environment a sizeable majority (43.39%) of parents reported use of this function to exhibit challenging behaviors, however 9.43% of both parents and teachers reported not using this function to exhibit challenging behaviors. More than half of the sample of parents (58.49%) reported to use function of challenging behavior to get sensory input, conversely to a percentage of teachers (8.80%) reporting use of this function to exhibit challenging behaviors. About 64% of parents reported use of the function of self-stimulation to exhibit challenging behavior, while only 4.40% of teachers reported that their students used this function to exhibit challenging behaviors. A majority of the sample of parents (64.15%) were reported to request a tangible item at school whereas a smaller percentage of teachers (6.28%) reported the use of this function to exhibit challenging behaviors.

Research Question 2-4: Are there differences in the functions of challenging behavior displayed by children without ASD at home between parents' report and teacher's report?

The functions of challenging behaviors displayed by children without ASD at home as reported by parents and teachers can be found in Table 11.

Table 11

Differences in the functions of challenging behavior displayed by children without ASD at home between parents' report and teacher's report.

	Parent only	Teacher only	Neither teacher or parent	Both teacher and parent
To get attention	53	14	27	65
	33.33%	8.80%	16.98%	40.88%
To avoid or escape a task or environment	40	14	27	78
	25.15%	8.80%	16.98%	49.05%
To get sensory input	88	5	36	30
	55.34%	3.14%	22.64%	18.86%
Self-stimulation	96	4	37	22
	60.37%	2.51%	23.27%	13.83%
To request a tangible item	82	7	34	36
	51.57%	4.40%	21.38%	22.64%

Yes, there were differences in the functions of challenging behavior displayed by children without ASD at home between parents' report and teacher's report. The result in Table 11 indicated that 40.88% of both parents and teachers reported that children without ASD used challenging behaviors to get attention, while 8.80% of teachers reported use of this function. As for the function of avoiding or escaping a task/environment, 49.05% of teachers and parents reported the use of this function, while only 8.80% of teachers reported use of this function to exhibit challenging behaviors. Just above half (55.34%) of the parent category reported use of function to get sensory input, while only 3.14 % of teachers reported use of this function. When it came to the function of self-stimulation, 60.37% of parents reported that their children exhibited challenging behaviors due to this function. Only 2.51% of children without ASD were reported by only by their teachers to use this function at home. Compared with 51.57% parents who reported that their children exhibited challenging behaviors to request a tangible item, only 4.40% of children were reported to do so by their teachers at home.

Findings reported for research question 2 were that the functions with the highest rates of parents and teachers indicating that children with ASD did *not* use challenging behaviors were self-stimulation (35.90%) and requesting a tangible item (36.20%). It was found that in the home

environment, parents were more likely to indicate that problem behaviors were used for self-stimulation (22.20%), while teachers were more likely that children with ASD did so to get attention (26.70%) and to avoid or escape a task/environment (29.20%). For children without ASD, teachers and parents indicated that most students used challenging behaviors at school for the five functions considered in this study. It was also found that for children without ASD, parents were more likely than teachers to report that their children used challenging behavior for all five functions – by margins of 45-60% for the functions of self-stimulation, requesting a tangible item, and avoiding a task/environment.

Research Question 3-1: Are there differences in the functions of challenging behavior displayed by children with ASD and children without ASD at school as reported by parents?

The functions of challenging behaviors displayed by children with ASD and without ASD at school as reported by parents can be found in Table 12.

Table 12

Differences in the functions of challenging behavior displayed by children with ASD and children without ASD at school as reported by parents.

	Children with ASD	Children without ASD	Neither children with and without ASD	Both children with and without ASD
To get attention	86	41	77	33
	36.29%	17.30%	32.49%	13.92%
To avoid or escape a task or environment	36	49	69	83
	15.18%	20.67%	29.11%	35.02%
To get sensory input	55	25	93	64
	23.20%	10.54%	39.24%	27.00%
Self-stimulation	75	16	102	44
	31.64%	6.75%	43.03%	18.56%

To request a tangible item	84 35.44%	16 6.75%	102 43.03%	35 14.76%

Yes, there were differences in the functions of challenging behavior displayed by children with ASD and children without ASD at school as reported by parents. The result in Table 12 show that children with ASD were more likely than those without ASD to be reported by parents to use all the functions of challenging behaviors except for the function of avoiding or escaping a task or environment. While 36.29% of children with ASD were reported to use challenging behavior to get attention, 17.3% of children without ASD were reported to do so. When it came to escaping a task or environment, 35.02% of parents reported that both children with and without ASD used this function of challenging behavior, whereas 15.18% children with ASD were reported to use this function to exhibit challenging behaviors. Approximately 40% of the responses fell into the neither category regarding the function of getting sensory input, while 10.54% of responses on this function fell into the category of children without ASD. Only 6.75% of parents reported that children without ASD did not exhibit challenging behaviors for self-stimulation, while 43.03% of parents of children with or without ASD reported that this function was not used to exhibit challenging behaviors. Parents of children without ASD (6.75%) were more likely to report use of challenging behavior to request a tangible item, whereas a sizeable majority of parents 43.03% reported that neither type of child used challenging behavior for this function.

Research Question 3-2: Are there differences in the functions of challenging behavior displayed by children with ASD and children without ASD at school as reported by teachers?

The functions of challenging behaviors displayed by children with ASD and without ASD at school as reported by teachers can be found in Table 13.

Table 13

Differences in the functions of challenging behavior displayed by children with ASD and

children without ASD at school as reported by teachers.

	Children with ASD	Children without ASD	Neither children with and without ASD	Both children with and without ASD
To get attention	60 23.90%	32 12.74%	9 3.58%	150 59.76%
To avoid or escape a task or environment	24 9.56%	26 10.35%	15 5.97%	186 74.10%
To get sensory input	103 41.03%	14 5.57%	27 10.75%	107 42.62%
Self-stimulation	118 47.01%	7 2.78%	34 13.54%	92 36.65%
To request a tangible item	119 47.41%	10 3.98%	31 12.35%	91 36.25%

Yes, there were differences in the functions of challenging behavior displayed by

children with ASD and children without ASD at school as reported by teachers. Teachers

reported that both children with and without ASD were likely to use challenging behavior at

school to get attention (59.76%), while only 3.58% indicated that neither children with nor

without ASD would use this function. A large percentage of teachers (74.10%) indicated that

both children with and without ASD used challenging behavior to avoid or escape a task

environed, with only 5.97% teachers reporting that children with and without ASD not using this

function to exhibit challenging behaviors. More children with and without ASD indicated use of

the function of getting sensory input (42.62%) than children without ASD (5.57%) to exhibit

challenging behaviors. For self-stimulation 47.01% of children with ASD were reported by

teachers to use challenging behavior at school, as compared with only 2.78% of children without

ASD. A large percentage, 47.41% of teachers reported children with ASD used function to request a tangible item to exhibit challenging behaviors. Only 3.98% of children without ASD were reported to use challenging behavior for this function.

Research Question 3-3: Are there differences in the functions of challenging behavior displayed by children with ASD and children without ASD at home as reported by parents?

The functions of challenging behaviors displayed by children with ASD and without ASD at home as reported by parents can be found in Table 14.

Table 14

Differences in the functions of challenging behavior displayed by children with ASD and children without ASD at home as reported by parents.

	Children with ASD	Children without ASD	Neither children with and without ASD	Both children with and without ASD
To get attention	60 25.31%	65 27.42%	53 22.36%	59 24.89%
To avoid or escape a task or environment	31 13.08%	78 32.91%	40 16.87%	88 37.13%
To get sensory input	53 22.36%	30 12.65%	88 37.13%	66 27.84%
Self-stimulation	73 30.80%	22 9.28%	96 40.50%	46 19.40%
To request a tangible item	69 29.11%	36 15.18%	82 34.59%	50 21.09%

Yes, there were differences in the functions of challenging behavior displayed by children with ASD and children without ASD at home as reported by parents. The responses for trying to receive attention were almost evenly split among the four categories; children without ASD was the highest response category here but a very slim margin (27.42%). 37.13% of parents reported that both children with and without ASD used challenging behavior at home to avoid or

escape a task, while 13.08% children with ASD were reported to use this function to exhibit

challenging behavior. More than one third of the parents 37.1% reported that neither children

with and without ASD used challenging behavior to get sensory input, followed by 27.84% both

children with and without ASD were reported to use this function to exhibit challenging

behaviors. Regarding the function of self-stimulation, a large percentage (40.50%) of parents

reported that their children with or without ASD did not use this function to exhibit challenging

behaviors. However, a smaller portion of children without ASD (9.28%) were reported to use

this function to exhibit challenging behaviors. Similarly, for the function of requesting a tangible

item, more parents reported the use of this function in children with ASD (29.11%) than in

children without ASD (15.18%).

Research Question 3-4: Are there differences in the functions of challenging behavior displayed

by children with ASD and children without ASD at home as reported by teachers?

The functions of challenging behaviors displayed by children with ASD and without

ASD at home as reported by teachers can be found in Table 15.

Table 15

Differences in the functions of challenging behavior displayed by children with ASD and

children without ASD at home as reported by teachers.

	Children with ASD	Children without ASD	Neither children with and without ASD	Both children with and without ASD
To get attention	122 48.60%	14 5.57%	27 10.75%	88 35.05%
To avoid or escape a task or environment	114 45.41%	14 5.57%	27 10.75%	96 38.24%
To get sensory input	155 61.75%	5 1.99%	36 14.34%	55 21.91%

Self-stimulation	166	4	37	44
	66.13%	1.59%	14.74%	17.52%
To request a tangible item	150	7	34	60
	59.76%	2.70%	13.54%	23.90%

Yes, there were differences in the functions of challenging behavior displayed by children with ASD and children without ASD at home as reported by teachers. Almost half of teachers (48.60%) reported that their student used challenging behavior at home to get attention, while 5.57% reported that children without ASD used this function. Regarding the function of avoiding or escaping the task or environment, children without ASD (5.57%) were not very likely to use this function as compared to children with ASD (45.41%). A majority of teachers reported that children with ASD (61.75%) used the function of sensory input at home, compared to a small minority in the without ASD category (1.99%). While 17.52% of teachers reported that both types of children used the function of self-stimulation, a majority of responses once again fell in the children with ASD (66.13%) only category. Similarly, most responses for the last function, requesting a tangible item, fell into the children with ASD only (59.76%) category compared to 2.70% of children without ASD who reported to use this function to exhibit challenging behaviors.

Table 15 shows the teacher-reported data for children with and without ASD for the five functions of challenging behavior at home. The response patterns across the four categories was remarkably similar for the five functions of challenging behavior considered. According to teachers, children with ASD are considerably more likely to exhibit challenging behaviors for reasons related to all five functions, and by large margins (40-60%), as compared to children without ASD. A small minority of teachers (<15% for every function) reported neither type of student was likely to exhibit challenging behaviors for the functions included in this study.

The results of the finding of research question 3 demonstrated that children with ASD were reported by parents to be more likely to use the functions of challenging behavior for every function except to avoid or escape a task/environment. According to teachers, students with ASD were more likely by wide margins (around 40%) than those without ASD to exhibit challenging behaviors at school to get sensory input, for self-stimulation, and to request a tangible item. At home, parents indicated that most children did use all five functions of challenging behavior – though around 35-40% of children were not reported to use the functions of getting sensory input, self-stimulation, and requesting a tangible item. The difference between parents of children with and without ASD were trivial for the function of getting attention (<2%).

Research Question 4-1 Are there differences between parents and teachers in the use of evidence-based strategies to deal with challenging behaviors of children with ASD?

Table 16 presents a comparison of mean between parents (N= 119) and teachers (N=210) in the use of evidence-based strategies to deal with challenging behaviors of children with ASD.

Table 16

The Evidence-Based Strategies used by Parents and Teachers of Children with ASD

Strategies	Parents Mean	Teachers Mean
Both parents and teachers collaborate to change assignments to assist a child's learning	2.09	2.23
Providing a choice of activities within a task or completion of a project	2.22	2.69
Breaking assignments into segments	2.33	2.69
Making adaptations and modification to make task easier/more fun	2.45	2.74
Checking a child's work to assess comprehension	2.55	2.70
Alternating tasks/assignments	2.00	2.63
Giving permission to a child to move away from non-preferred person	1.99	2.28
Ignore purposefully when showing tantrums or crying	2.04	2.45
If appropriate, allowing to work alone	2.19	2.18

Reducing the number of people who are required to work together	2.09	2.33
Pairing for support with an appropriate model	2.22	2.14
Provide a self-monitoring checklist at home/school	1.44	1.50
Encourage a child to express or verbalize feelings	2.69	2.65
Create a safe environment where a child can make mistakes	2.79	2.83
Rewarding a child to complete non-preferred task	2.68	2.80
Prompting to ask for help prior to a stressful situation	2.50	2.70
Limiting number of "escapes" or number of times they can avoid a task per day	1.83	2.28
Providing an opportunity to a child to avoid or escape a task	1.67	1.81
Reinforcing positive effortful behavior	2.81	2.94
Teaching strategies such as breathing/relaxation to reduce stress	1.85	2.02
Encouraging appropriate attempts for attention	2.49	2.76
Use socially active peers who speak clearly, use eye contact and observe appropriate distance, to model and reinforce appropriate behavior	2.05	2.07
Timer to set for short periods	1.59	2.35
Provide positive attention such as praise and acknowledgement	2.83	2.94
Provide opportunities to be involved such as taking responsibilities/ jobs both at home and school	2.47	2.37
Providing frequent turns	2.37	2.51
Encourage communication	2.86	2.87
Give high fives	2.42	2.62
Immediate and frequent feedback on positive behavior	2.86	2.91
Providing correction calmly, immediately and respectfully	2.63	2.89
An adult walking away rather than engaging in a power struggle	2.29	2.26
Provide a child/student waiting time before making another request	2.09	2.55
Allowing a child to adjust seats, positions if needed for sensory reasons	2.50	2.52
Allowing stretch breaks	2.35	2.45
Allowing a child to stand and work	2.37	2.28
Allowing "wiggle cushion", heavy rubber bands, "squish balls", weighted lap pad, tilted chair, slant board, bean bag chairs	1.99	2.19
Acknowledge the sensory need when asked appropriately	2.40	2.52
Allowing going to quiet area	2.51	2.40

Reducing over stimulating distractions	2.49	2.61
Talking to children about change in the plan and possible emergency change in plans	2.31	2.38
Providing multi-sensory (audio, visual and tactile etc.) instructional strategies	2.22	2.52
Allowing moving toward desired element such as light, heat, good smell	2.08	2.03
Providing opportunities for preferred sensory stimulation such as music, object while staying on task	2.38	2.32
Providing access to preferred item to hold while completing a task	2.12	2.28
Providing snacks	2.47	2.38
Providing motivating activities to choose from when bored/overwhelmed	2.36	2.53
Acknowledging appropriate requests for items	2.69	2.89
Having more than one preferred choice from which to select	2.42	2.75
Keeping distracting items out of sight	2.36	2.56
Providing rules and guidelines to a child for the items which may create dispute	2.50	2.51
Providing visual schedule	2.24	2.69
Using visual prompt	2.01	2.48
Using verbal prompt	2.72	2.83
Using physical prompts	2.01	2.28

Table 17:

	Respondents	*N*	M (SD)	*T*	*P*
Sum of Strategies	Teachers	210	47.8000 (11.39953)	1.331	.185
	Parents	119	45.7800 (12.72600)		

Table 17 demonstrates the comparison of the mean of the sum of strategies between

parents (N= 119) and teachers (N=210) in the use of evidence-based strategies to deal with

challenging behaviors of children with ASD. An independent samples *t*-test showed there was

not a significant difference between teachers and parents in the total number of the evidence-based strategies used ($t = 1.331$, $p = .185$).

Although there were no significant differences between parents and teachers in the use of evidence-based strategies to deal with challenging behaviors of children with ASD, a few strategies were reported that are most and least common reported by parents of children with ASD. The five most common strategies reported by parents of children with ASD that help in dealing with challenging behavior were: creation of a safe environment where a child can make mistakes, reinforce positive behavior, effortful behavior, provide positive attention such as praise and acknowledgement, encourage communication and immediate and frequent feedback on positive behavior. The five least common strategies reported by parents of children with ASD to deal with challenging behavior were: provision of a self-monitoring checklist at school, limiting the number of escapes or number of times they can avoid a task, providing an opportunity to a child to avoid or escape a task, teach strategies such as breathing/relaxation to reduce stress and use a timer to set up for short periods.

The five most common strategies reported by teachers of children with ASD to deal with challenging behavior were: reinforcing positive effortful behavior, providing positive attention such as praise and acknowledgement, immediate and frequent feedback on positive behavior, providing correction calmly, immediately and respectfully acknowledging appropriate request for items. The five least common strategies reported by teachers of children with ASD to deal with challenging behavior were: providing a self-monitoring checklist at home/school, providing an opportunity to a child to avoid or escape a task, teaching strategies such as breathing/relaxation to reduce stress, using socially active peers who speak clearly, use eye

contact and observe appropriate distance, modeling and reinforcing appropriate behavior and

allowing movement toward a desired element such as light, heat and good smell.

Research Question 4-2 Are there differences between parents and teachers in the use of

evidence-based strategies to deal with challenging behaviors of children without ASD?

Table 18 presents comparison of mean differences between parents (*N*= 118) and teachers

(*N*=41) in the use of evidence-based strategies to deal with challenging behaviors of children

without ASD.

Table 18:
The Evidence-Based Strategies used by Parents and Teachers of Children without ASD

Strategies	Parents Mean	Teachers Mean
Both parents and teachers collaborate to change assignments to assist a child's learning	1.84	2.07
Providing a choice of activities within a task or completion of a project	2.25	2.13
Breaking assignments into segments	2.24	2.20
Making adaptations and modification to make task easier/more fun	2.37	2.27
Checking a child's work to assess comprehension	2.37	2.67
Alternating tasks/assignments	2.03	2.00
Giving permission to a child to move away from non-preferred person	2.00	2.03
Ignore purposefully when showing tantrums or crying	2.13	2.00
If appropriate, allowing to work alone	2.40	2.17
Reducing the number of people who are required to work together	1.90	1.93
Pairing for support with an appropriate model	1.91	2.20
Provide a self-monitoring checklist at home/school	1.24	1.47
Encourage a child to express or verbalize feelings	2.74	2.53
Create a safe environment where a child can make mistakes	2.79	2.50
Rewarding a child to complete non-preferred task	2.53	2.13
Prompting to ask for help prior to a stressful situation	2.40	2.23
Limiting number of "escapes" or number of times they can avoid a task per day	1.60	1.90
Providing an opportunity to a child to avoid or escape a task	1.47	1.33
Reinforcing positive effortful behavior	2.81	2.60

Teaching strategies such as breathing/relaxation to reduce stress	1.91	1.77
Encouraging appropriate attempts for attention	2.26	2.53
Use socially active peers who speak clearly, use eye contact and observe appropriate distance, to model and reinforce appropriate behavior	1.78	2.10
Timer to set for short periods	1.31	2.03
Provide positive attention such as praise and acknowledgement	2.85	2.63
Provide opportunities to be involved such as taking responsibilities/ jobs both at home and school	2.56	2.30
Providing frequent turns	2.53	2.40
Encourage communication	2.78	2.70
Give high fives	2.47	2.33
Immediate and frequent feedback on positive behavior	2.84	2.70
Providing correction calmly, immediately and respectfully	2.51	2.63
An adult walking away rather than engaging in a power struggle	2.10	2.07
Provide a child/student waiting time before making another request	2.01	2.13
Allowing a child to adjust seats, positions if needed for sensory reasons	2.10	2.07
Allowing stretch breaks	2.07	2.00
Allowing a child to stand and work	2.00	2.00
Allowing "wiggle cushion", heavy rubber bands, "squish balls", weighted lap pad, tilted chair, slant board, bean bag chairs	1.28	1.77
Acknowledge the sensory need when asked appropriately	1.82	2.13
Allowing going to quiet area	2.10	1.93
Reducing over stimulating distractions	2.06	2.13
Talking to children about change in the plan and possible emergency change in plans	2.21	2.10
Providing multi-sensory (audio, visual and tactile etc.) instructional strategies	1.94	2.33
Allowing moving toward desired element such as light, heat, good smell	1.79	1.87
Providing opportunities for preferred sensory stimulation such as music, object while staying on task	1.96	1.97
Providing access to preferred item to hold while completing a task	1.94	1.93
Providing snacks	2.37	1.97

Providing motivating activities to choose from when bored/overwhelmed	2.37	2.20
Acknowledging appropriate requests for items	2.53	2.60
Having more than one preferred choice from which to select	2.37	2.27
Keeping distracting items out of sight	2.18	2.40
Providing rules and guidelines to a child for the items which may create dispute	2.49	2.40
Providing visual schedule	1.46	2.43
Using visual prompt	1.51	2.33
Using verbal prompt	2.56	2.77
Using physical prompts	1.85	2.20

Table 19

	Respondents	*N*	M(SD)	*t*	*P*
Sum of Strategies	Teachers	41	44.0526 (14.15350)	.651	.517
	Parents	118	42.2556 (14.57068)		

Table 19 demonstrates the comparison of the sum of strategies between parents (*N*= 118)

and teachers (*N*=41) in the use of evidence-based strategies to deal with challenging behaviors of

children without ASD. An independent samples t-test showed there is not a significant difference

between teachers and parents in the total number of the evidence-based strategies used (*t*= .651,

p= .517).

However, a few strategies are reported that are most and least common reported by

parents of children without ASD. The five most common strategies reported by parents of

children without ASD to deal with challenging behavior were: creating a safe environment where

a child can make mistakes, reinforcing positive, effortful behavior, providing positive attention

such as praise and acknowledgement, encouraging communication and immediate frequent

feedback on positive behavior. The five least common strategies reported by parents of children

without ASD to deal with challenging behavior were: allowing wiggle cushions, heavy rubber

bands, squish balls, weighted lap pad, titled chair, slant board and bean bag chairs, using a timer

for short periods, providing a visual schedule and using verbal prompts.

The five most common strategies reported by teachers of children without ASD to deal

with challenging behavior were: providing positive attention such as praise and

acknowledgement, immediate and frequent feedback on positive behavior, providing correction

calmly, immediately and respectfully encouraging communication and using verbal prompts. The

five least common strategies reported by teachers of children without ASD to deal with

challenging behavior were: providing a self-monitoring checklist at home/school, providing an

opportunity to a child to avoid or escape a task, teaching strategies such as breathing/ relaxation

to reduce stress, allowing moving toward a desired element such as light, heat, good smell and

allowing wiggle cushions, heavy rubber bands, squish balls, weighted lap pad, titled chair, slant

board and bean bag chairs.

Research Question 4-3 Are there differences in the use of evidence-based strategies to deal with

challenging behaviors of children with ASD and children without ASD by parents?

Table 20 presents a comparison of the mean differences in the use of evidence-based

strategies to deal with challenging behaviors of children with ASD ($N = 119$) and children

without ASD ($N=118$) by parents.

Table 20

The Evidence-Based Strategies used by Parents of Children with and without ASD

Strategies	Children with ASD Mean	Children w/o ASD Mean
Both parents and teachers collaborate to change assignments to assist a child's learning	1.84	2.09
Providing a choice of activities within a task or completion of a project	2.25	2.22
Breaking assignments into segments	2.24	2.33

Making adaptations and modification to make task easier/more fun	2.37	2.45
Checking a child's work to assess comprehension	2.37	2.55
Alternating tasks/assignments	2.03	2.00
Giving permission to a child to move away from non-preferred person	2.00	1.99
Ignore purposefully when showing tantrums or crying	2.13	2.04
If appropriate, allowing to work alone	2.40	2.19
Reducing the number of people who are required to work together	1.90	2.09
Pairing for support with an appropriate model	1.91	2.22
Provide a self-monitoring checklist at home/school	1.24	1.44
Encourage a child to express or verbalize feelings	2.74	2.69
Create a safe environment where a child can make mistakes	2.79	2.79
Rewarding a child to complete non-preferred task	2.53	2.68
Prompting to ask for help prior to a stressful situation	2.40	2.50
Limiting number of "escapes" or number of times they can avoid a task per day	1.60	1.83
Providing an opportunity to a child to avoid or escape a task	1.47	1.67
Reinforcing positive effortful behavior	2.81	2.81
Teaching strategies such as breathing/relaxation to reduce stress	1.91	1.85
Encouraging appropriate attempts for attention	2.26	2.49
Use socially active peers who speak clearly, use eye contact and observe appropriate distance, to model and reinforce appropriate behavior	1.78	2.05
Timer to set for short periods	1.31	1.59
Provide positive attention such as praise and acknowledgement	2.85	2.83
Provide opportunities to be involved such as taking responsibilities/ jobs both at home and school	2.56	2.47
Providing frequent turns	2.53	2.37
Encourage communication	2.78	2.86
Give high fives	2.47	2.42
Immediate and frequent feedback on positive behavior	2.84	2.86
Providing correction calmly, immediately and respectfully	2.51	2.63
An adult walking away rather than engaging in a power struggle	2.10	2.29

Provide a child/student waiting time before making another request	2.01	2.09
Allowing a child to adjust seats, positions if needed for sensory reasons	2.10	2.50
Allowing stretch breaks	2.07	2.35
Allowing a child to stand and work	2.00	2.37
Allowing "wiggle cushion", heavy rubber bands, "squish balls", weighted lap pad, tilted chair, slant board, bean bag chairs	1.28	1.99
Acknowledge the sensory need when asked appropriately	1.82	2.40
Allowing going to quiet area	2.10	2.51
Reducing over stimulating distractions	2.06	2.49
Talking to children about change in the plan and possible emergency change in plans	2.21	2.31
Providing multi-sensory (audio, visual and tactile etc.) instructional strategies	1.94	2.22
Allowing moving toward desired element such as light, heat, good smell	1.79	2.08
Providing opportunities for preferred sensory stimulation such as music, object while staying on task	1.96	2.38
Providing access to preferred item to hold while completing a task	1.94	2.12
Providing snacks	2.37	2.47
Providing motivating activities to choose from when bored/overwhelmed	2.37	2.36
Acknowledging appropriate requests for items	2.53	2.69
Having more than one preferred choice from which to select	2.37	2.42
Keeping distracting items out of sight	2.18	2.36
Providing rules and guidelines to a child for the items which may create dispute	2.49	2.50
Providing visual schedule	1.46	2.24
Using visual prompt	1.51	2.01
Using verbal prompt	2.56	2.72
Using physical prompts	1.85	2.01

Table 21

Respondents	*N*	M (SD)	*t*	*P*
With ASD	119	45.7800	1.767	.079

Sum of Strategies			(12.72600)
	Without ASD	118	42.2556
			(14.57068)

Table 21 demonstrates the comparison of the mean of the sum of strategies used by parents of children with ASD ($N = 119$) and children without ASD ($N = 118$) to deal with challenging behaviors. An independent t-test showed the total evidence-based strategies used by parents for children with ASD did not differ from that used by parents for children without ASD ($t = 1.767$, $p = .079$).

However, a few strategies are reported that are most and least common reported by parents of children with ASD. The five most common strategies reported by parents of children with ASD to deal with challenging behavior were: encouraging a child to express or verbalize feelings, creating a safe environment where a child can make mistakes, reinforcing positive effortful behavior, providing positive attention such as praise and acknowledgement, immediate and frequent feedback on positive behavior. The five least common strategies reported by parents of children with ASD to deal with challenging behavior were: providing a self-monitoring checklist at home/school, providing an opportunity to a child to avoid or escape a task, setting a timer for short periods, allowing wiggle cushions, heavy rubber bands, squish balls, weighted lap pad, titled chair, slant board and bean bag chairs and providing visual schedule.

The five most common strategies reported by parents of children without ASD to deal with challenging behavior were: creating a safe environment where a child can make mistakes, reinforcing positive effortful behavior, providing positive attention such as praise and acknowledgement and encouraging communication. The five least common strategies reported by parents of children without ASD to deal with challenging behavior were: providing a self-

monitoring checklist at home/school, providing an opportunity to a child to avoid or escape a

task, limiting number of escapes or number of times they can avoid a task per day, teaching

strategies such as breathing/ relaxation to reduce stress and setting a timer for short periods.

Research Question 4-4 Are there differences in the use of evidence-based strategies to deal with

challenging behaviors of children with ASD and children without ASD by teachers?

Table 22 presents a comparison of mean differences in the use of evidence-based

strategies to deal with challenging behaviors of children with ASD ($N = 210$) and children

without ASD ($N = 41$) by teachers.

Table 22

The Evidence-Based Strategies used by Teachers of Children with and without ASD

Strategies	Children with ASD Mean	Children without ASD Mean
Breaking assignments into segments	2.07	2.23
Providing a choice of activities within a task or completion of a project	2.13	2.69
Breaking assignments into segments	2.20	2.69
Making adaptations and modification to make task easier/more fun	2.27	2.74
Checking a child's work to assess comprehension	2.67	2.70
Alternating tasks/assignments	2.00	2.63
Giving permission to a child to move away from non-preferred person	2.03	2.28
Ignore purposefully when showing tantrums or crying	2.00	2.45
If appropriate, allowing to work alone	2.17	2.18
Reducing the number of people who are required to work together	1.93	2.33
Pairing for support with an appropriate model	2.20	2.14
Provide a self-monitoring checklist at home/school	1.47	1.50
Encourage a child to express or verbalize feelings	2.53	2.65
Create a safe environment where a child can make mistakes	2.50	2.83
Rewarding a child to complete non-preferred task	2.13	2.80
Prompting to ask for help prior to a stressful situation	2.23	2.70

Limiting number of "escapes" or number of times they can avoid a task per day	1.90	2.28
Providing an opportunity to a child to avoid or escape a task	1.33	1.81
Reinforcing positive effortful behavior	2.60	2.94
Teaching strategies such as breathing/relaxation to reduce stress	1.77	2.02
Encouraging appropriate attempts for attention	2.53	2.76
Use socially active peers who speak clearly, use eye contact and observe appropriate distance, to model and reinforce appropriate behavior	2.10	2.07
Timer to set for short periods	2.03	2.35
Provide positive attention such as praise and acknowledgement	2.63	2.94
Provide opportunities to be involved such as taking responsibilities/ jobs both at home and school	2.30	2.37
Providing frequent turns	2.40	2.51
Encourage communication	2.70	2.87
Give high fives	2.33	2.62
Immediate and frequent feedback on positive behavior	2.70	2.91
Providing correction calmly, immediately and respectfully	2.63	2.89
An adult walking away rather than engaging in a power struggle	2.07	2.26
Provide a child/student waiting time before making another request	2.13	2.55
Allowing a child to adjust seats, positions if needed for sensory reasons	2.07	2.52
Allowing stretch breaks	2.00	2.45
Allowing a child to stand and work	2.00	2.28
Allowing "wiggle cushion", heavy rubber bands, "squish balls", weighted lap pad, tilted chair, slant board, bean bag chairs	1.77	2.19
Acknowledge the sensory need when asked appropriately	2.13	2.52
Allowing going to quiet area	1.93	2.40
Reducing over stimulating distractions	2.13	2.61
Talking to children about change in the plan and possible emergency change in plans	2.10	2.38
Providing multi-sensory (audio, visual and tactile etc.) instructional strategies	2.33	2.52
Allowing moving toward desired element such as light, heat, good smell	1.87	2.03

Providing opportunities for preferred sensory stimulation such as music, object while staying on task	1.97	2.32
Providing access to preferred item to hold while completing a task	1.93	2.28
Providing snacks	1.97	2.38
Providing motivating activities to choose from when bored/overwhelmed	2.20	2.53
Acknowledging appropriate requests for items	2.60	2.89
Having more than one preferred choice from which to select	2.27	2.75
Keeping distracting items out of sight	2.40	2.56
Providing rules and guidelines to a child for the items which may create dispute	2.40	2.51
Providing visual schedule	2.43	2.69
Using visual prompt	2.33	2.48
Using verbal prompt	2.77	2.83
Using physical prompts	2.20	2.28

Table 23

	Respondents	*N*	M (SD)	*t*	*P*
Sum of Strategies	With ASD	210	47.8000 (11.39953)	1.536	.131
	Without ASD	41	44.0526 (14.15350)		

Table 23 demonstrates the comparison of the mean of the sum of strategies used by teachers of children with ASD (*N* = 210) and children without ASD (*N* = 41) to deal with challenging behaviors. An independent t-test showed the total evidence-based strategies used by parents for children with ASD did not differ from that used by teachers for children without ASD (*t* = 1.536, *p* = .131).

However, a few strategies are reported that are most and least common reported by teachers of children with ASD and children without ASD. The five most common strategies reported by teachers of children with ASD to deal with challenging behavior were: reinforcing positive effortful behavior, providing positive attention such as praise and acknowledgement,

immediate and frequent feedback on positive behavior, providing correction calmly, immediately and respectfully encouraging communication. The five least common strategies reported by teachers of children with ASD to deal with challenging behavior were: providing a self-monitoring checklist at home/school, providing an opportunity to a child to avoid or escape a task, allowing moving toward desired element such as light, heat, good smell and using socially active peers who speak clearly, use eye contact and observe appropriate distance, to model and reinforce appropriate behavior.

The five most common strategies reported by teachers of children without ASD to deal with challenging behavior were: using verbal prompts, providing positive attention such as praise and acknowledgement, immediate and frequent feedback on positive behavior, providing correction calmly, immediately and respectfully encouraging communication. The five least common strategies reported by teachers of children without ASD to deal with challenging behavior were: providing a self-monitoring checklist at home/school, providing an opportunity to a child to avoid or escape a task, allowing moving toward desired element such as light, heat, good smell and using socially active peers who speak clearly, use eye contact and observe appropriate distance, to model and reinforce appropriate behavior.

Research Question 5: Are gender, age, country, and the diagnosis of ASD predictive of functions of challenging behavior?

This study investigated five functions of challenging behavior at school and home including: (a) to gain attention, (b) to avoid or escape a task or environment, (c) to get sensory input, (d) to self-stimulate, and (e) to request a tangible item. Thus, five logistic regression analyses were performed to understand whether age, gender, country and diagnosis of ASD were

predictive of each function of challenging behavior at both school and home – making for a total of 10 logistic models in total.

Function (A) to get attention at school:

Table 24 shows the logistic regression results for the function of using challenge behaviors to get attention at school. Age, diagnosis, gender, and living in the United States (country) were not significantly related to exhibiting challenging behavior to get attention at school. Although not significant, the regression model showed that children with autism were more likely to use challenging behavior to get attention at school than their non-autistic counter parts were, and this effect was trending toward significance ($p = .120$) and explained about 4-5% of the variance in the model when added on top of age. The omnibus test for overall model significance was not significant ($\chi^2_{(df=4)} = 5.358$, $p = 252$).

Table 24

Logistic regression model for children exhibiting challenge behaviors to get attention at school.

Factor	B	SE	Wald	df	p
Age	.05	0.03	1.77	1	.184
Diagnosis	.32	0.13	2.42	1	.120
Female	.23	0.21	1.11	1	.292
Country	-.014	7.0	.002	1	.962
Constant	-.59	0.27	2.22	1	.136

Function (B) to avoid or escape a task or environment at school:

Table 25 shows the logistic regression results for the function of using challenge behaviors to avoid or escape a task or environmental school. Diagnosis ($p < .001$) showed significance at the .001 level; children with ASD were more likely to use challenging behavior to

avoid or escape a task or environment at school. Gender was also significant at the .05

significance level, females were less likely to use challenging behaviors to avoid or escape a task

or environment at school. Age and living in the United States (country) were not significant

predictors of exhibiting challenging behaviors to avoid or escape a task/environment. The

omnibus test for overall model significance was significant ($\chi^2_{(df=4)}=$ 60.116, $p < .001^{**}$).

Table 25

Logistic regression model for children exhibiting challenge behaviors to avoid or

escape a task/environment at school.

Factor	B	SE	Wald	df	p
Age	-.02	0.08	.247	1	.619
Diagnosis	1.5	0.03	46.191	1	.000
Female	-.47	0.12	3.899	1	.048
Country	.007	7.00	.001	1	.985
Constant	.134	1.52	.088	1	.767

Function (C) to get sensory input at school:

Table 26 shows the logistic regression results for the function of using challenging

behaviors to get sensory input at school. Of all the independent variables, only diagnosis ($p <$

.001) was significant; children with ASD were 3.2 times more likely to use challenging behavior

to get sensory input at school. The omnibus test for overall model significance was found not to

be significant ($\chi^2_{(df=4)} = 36.993$, $p < .001^{**}$).

Table 26

Logistic regression model for children exhibiting challenge behaviors to get sensory input at school.

Factor	B	SE	Wald	df	p
Age	.039	0.04	.969	1	.325
Diagnosis	1.171	0.04	26.053	1	.000
Female	-.268	0.20	1.323	1	.250
Country	.118	0.79	.149	1	.699
Constant	-1.416	0.13	11.125	1	.001

Function (D) for self-stimulation at school.

Table 27 shows the logistic regression results for the function of using challenge behaviors for self-stimulation at school. Diagnosis ($p < .001$) was significant, while age, gender, and living in the United States (country) were not significantly related to exhibiting challenging behavior for self-stimulation at school. The omnibus test for overall model significance was significant ($\chi^2_{(df = 4)} = 32.931$, $p < .001$**).

Table 27

Logistic regression model for children exhibiting challenge behaviors for self-stimulation at school.

Factor	B	SE	Wald	df	p
Age	.022	0.08	.268	1	.605
Diagnosis	1.29	0.05	24.40	1	.000
Female	-.122	0.51	.240	1	.624

Country	-.042	2.47	.017	1	.895
Constant	-1.7	0.11	15.26	1	.136

Function (E) to request a tangible item at school:

Table 28 shows the logistic regression results for the function of using challenging behaviors to request a tangible item at school. Again, only diagnosis ($p < .001$) was significant in predicting the use of challenging behaviors to gain attention. Age, gender, and living in the United States (country) were not significantly related to exhibiting challenging behaviors to request a tangible item at school. The omnibus test for overall model significance was significant ($\chi^2_{(df = 4)} = 26.015, p < .001**$).

Table 28

Logistic regression model for children exhibiting challenge behaviors to request a tangible item at school.

Factor	B	SE	Wald	df	p
Age	-.072	0.03	2.814	1	.093
Diagnosis	1.18	0.06	19.642	1	.000
Female	-.180	0.36	.497	1	.481
Country	-.123	0.83	.149	1	.700
Constant	-1.14	0.18	6.475	1	.011

Function (A) to get attention at home:

Table 29 shows the logistic regression results for the function of using challenging behaviors to gain attention at home. Age ($p = .023$) was negatively related to using challenging behaviors at

home to get attention. Diagnosis, gender, and living in the United States (country) were not significantly related to exhibiting challenging behavior to gain attention at home. The omnibus test for overall model significance was not significant. ($\chi^2_{(df = 4)} =$ 8.624, $p = .071$.).

Table 29

Logistic regression model for children exhibiting challenge behaviors to get attention at home.

Factor	B	SE	Wald	df	p
Age	-.086	0.02	5.157	1	.023
Diagnosis	-.118	0.37	.318	1	.573
Female	-.059	0.82	.072	1	.788
Country	-.481	0.19	2.566	1	.109
Constant	1.010	0.16	6.223	1	.013

Function (B) to avoid or escape a task or environment at home:

Table 30 shows the logistic regression results for the function of using challenging behaviors to gain attention at home. Older children were less likely to use challenging behavior at home to avoid or escape a task/environment ($p = .01$). Diagnosis, gender, and living in the United States (country) were not significantly related to exhibiting challenging behavior to gain attention at home. The omnibus test for overall model significance was not significant ($\chi^2_{(df = 4)} =$ 7.168, $p = .127$).

Table 30

Logistic regression model for children exhibiting challenge behaviors to get attention at home.

Factor	B	SE	Wald	df	p
Age	-.100	0.02	6.623	1	.010
Diagnosis	.138	0.33	.423	1	.516

Female	.046	1.10	.042	1	.838
Country	-.118	0.80	.148	1	.700
Constant	1.031	0.16	6.291	1	.012

Function (C) to get sensory input at home:

Table 31 shows the logistic regression results for the function of using challenging behaviors to gain attention at home. Diagnosis ($p = .001$) was the only significant predictor of using challenging behaviors at home to gain attention at the five percent level. Age, gender, and living in the United States (country) were not significantly related to exhibiting challenging behavior to get sensory input at home. The omnibus test for overall model significance was significant ($\chi^2_{(df = 4)} = 19.554$, $p < .001**$).

Table 31

Logistic regression model for children exhibiting challenge behaviors to get attention at home.

Factor	B	SE	Wald	df	P
Age	-.078	0.02	3.665	1	.056
Diagnosis*	.767	0.07	10.490	1	.001
Female	-.201	0.29	.694	1	.405
Country	-.560	0.16	3.465	1	.063
Constant	-.180	0.96	.187	1	.665

Function (D) for self-stimulation at home:

Table 32 shows the logistic regression results for the function of using challenging behaviors to gain attention at home. Children diagnosed with ASD ($p = .011$) were 1.9 times more likely to use challenging behavior for self-simulation at home, while children living inside

the United States were reported to be less likely to use do so ($p = .021$). The omnibus test for overall model significance was significant ($\chi^2_{(df = 4)} = 15.283$, $p < .01*$).

Table 32

Logistic regression model for children exhibiting challenge behaviors for self-stimulation at home.

Factor	B	SE	Wald	df	p
Age	-.062	0.03	1.958	1	.162
Diagnosis	.661	0.10	6.391	1	.011
Female	-.167	0.42	.402	1	.526
Country	-.713	0.13	5.313	1	.021
Constant	-.520	0.38	1.386	1	.239

Function (E) to request a tangible item at home:

Table 33 shows the logistic regression results for the function of using challenging behaviors to request a tangible item at home. Diagnosis was the only significant predictor ($p = 0.41$). Age, gender, and living in the United States (country) were not significantly related to exhibiting challenging behavior to request a tangible item at home. The omnibus test for overall model significance was not significant ($\chi^2_{(df = 4)} = 11.351$, $p = .023$).

Table 33

Logistic regression model for children exhibiting challenge behaviors to request a tangible item at home.

Factor	B	SE	Wald	df	P
Age	-.103	0.02	6.406	1	.056
Diagnosis	.470	0.11	4.172	1	.041

Female	.073	0.76	.096	1	.756
Country	-.373	0.25	1.511	1	.219
Constant	-.078	2.23	.035	1	.851

Research Question 6: Are gender, age, country, and the diagnosis of ASD predictive of the number of evidence-based strategies used by parents?

The results of the multiple regression revealed that none of the factors were revealed as a significant predictor of the sum of the evidence-based strategies used by parents. Diagnosis ($p = .093$) was marginally significant at the .10 level and suggests that parents of children diagnosed with ASD are more likely to use evidence-based policies than parents of children without ASD. With a R^2 of only .033, the model overall was not significant, suggesting that none of the independent variables were explaining a significant amount of variance in the number of evidence-based policies used by parents.

Table 34

Gender, Age, Country, and the Diagnosis of ASD predictive of the number of evidence-based strategies used by parents.

Predictors	*B*	*t*	*P*	*F*	*P*
Gender	-.941	-.419	.676	1.579	.182
Age	.511	1.238	.217		
Country	3.241	1.145	.254		
Diagnosis	3.594	1.691	.093		
Adjusted R Square	.012				

R	.182
R^2	.033

Research Question 7: Are gender, age, country, and the diagnosis of ASD predictive of the number of evidence-based strategies used by teachers?

The results of the multiple regression revealed that none of the factors were revealed as a significant predictor of the sum of the evidence-based strategies used by teachers. The model overall was not significant, suggesting that none of the independent variables were explaining a significant amount of variance in the number of evidence-based policies used by parents. Accordingly, R^2 was estimated at .009.

Table 35

Gender, Age, Country, and the Diagnosis of ASD predictive of the number of evidence-based strategies used by teachers.

Predictors	*B*	*T*	*P*	*F*	*P*
Gender	.024	.011	.991	.435	.783
Age	-.283	-.810	.419		
Country	.677	.234	.816		
Diagnosis	2.510	1.054	.293		
Adjusted R Square	.012				
R	.095				
R^2	.009				

Chapter V

DISCUSSION

Overview

This chapter discusses the study findings. After providing an overview of the results,

findings related to the functions of challenging behavior in children with ASD and those without

ASD are discussed, including how parents and teachers reported the five functions of challenging

behavior as well as their understanding of the functions of the children's challenging behaviors,

how these behaviors were reported to occur in the home and school environments, and the

factors that predicted the functions of challenging behaviors with a specific focus on gender, age,

and the diagnosis of ASD.   Next, the chapter describes parents' and teachers' reports of

strategies that they use to address challenging behaviors. Differences between raters and

between strategies reported to be used at home and in school are discussed, followed by a

discussion of factors that predicted the use of evidence-based strategies. Collectively, the

findings are discussed relative to previous literature. The chapter concludes by discussing the

study limitations and future directions.

The study described the differences between parents' and teachers' reports of children

with and without ASD in their perception of the function of their children's challenging

behaviors and the strategies that they have utilized to decrease those behaviors. Overall, the

results of this study showed differences in the functions of challenging behavior across home and

school environments and in the use of evidence-based strategies to deal with challenging

behaviors of children with and without ASD as reported by parents and teachers. Specifically,

28% of the parents reported that their children used challenging behaviors to get attention at

home and 2% reported the use of challenging behaviors to seek attention at school. On the

contrary, 72% of the teachers indicated that children with ASD use challenging behaviors to seek attention at school and only 10% of the teachers suggested that they used them at home. This finding is critical as it shows the differences in the opinions towards the use of challenging behaviors in the home and school settings as reported by parents and teachers. Based on the finding's parents were less likely to report that their children with ASD used challenging behaviors either at school or at home to seek attention or certain favors. On the contrary, teachers suggested that children with ASD take advantage of their challenging behaviors to seek attention and other favors more so at school and to a limited extent at home. This finding is consistent with findings from a study by O'Nions et al. (2017) who noted that parents are able to manage a child's problematic behavior at home through adapting situations that suit the child which then minimizes the need for a child to use challenging behaviors to get attention at home. This past finding may support the reason why a reduced percentage of parents, relative to teachers, reported that their children used challenging behaviors to get attention at home or at school.

Functions of Challenging Behaviors

Differences between children with ASD and those without ASD in functions. The results of this study indicated that there were differences in the functions of challenging behavior in children with and without ASD as reported by parents and teachers. Specifically, the study results indicated that parents with children with ASD didn't report the use of challenging behaviors to self-stimulate at school. In addition, they were significantly more likely to use challenging behaviors to avoid or escape a task or environment, self-stimulate, and request a tangible item at school more than children without ASD. On the other hand, teachers reported that children with ASD were significantly more likely to use challenging behaviors to seek attention, get sensory input, self-stimulate and request a tangible item at the home setting more

than children without ASD. At the school setting, teachers reported that children with ASD were

significantly more likely to use challenging behaviors to avoid or escape a task or environment,

get sensory input, self-stimulate and request a tangible more than children without ASD. These

findings indicate that there is a direct relationship between ASD and challenging behavior. One

of the possible reasons for the differences between the parents and teachers' reports could be that

the teachers were less likely to report the use of challenge behaviors at only home for all the five

functions, whereas as reported by the parents, most children did use all five functions of

challenging behavior at home and school settings. The current study indicated a similarity in the

pattern of teachers selecting the function of the challenging behaviors; both teachers of children

with and without ASD reported the use of challenging behavior to get attention and to escape or

avoid a task/ environment. In line with the findings of the present study, Lang and colleagues

(2010) found that functions of challenging behaviors were attention and escape at school as

reported by the teachers and professionals. These findings suggest that the main factors that can

clearly elaborate challenging behavior in children are their desire for attention and avoidance of a

task or a specific environment. According to Dunlap et al. (2006), challenging behaviors can

potentially lead to future maladjustment in school and adult life for both children with and

without ASD. Therefore, it is important for professionals across various disciplines to seek

resources and training that enable them to identify the functions of challenging behaviors as well

as effective interventions to decrease these (Dunlap et al., 2006). Indeed, according to Hart &

Whalon, (2013), challenging behaviors are a major concern for young children with ASD and are

considered particularly difficult to manage by both teachers and parents.

The study reveals that there are differences in the functions of challenging behaviors

displayed by children with ASD across home and school environments as reported by parents.

Similar to the findings in the present study, Lindsay, Proulx, Thomson, and Scott (2013) found that children with ASD could display a number of challenging behaviors. The forms of such behavior could be considered as being physically aggressive as well as behavior that leads to negative impact both to the individual and the family. The study's findings are also in line with those of Hong, Dixon, Stevens, Burns, and Linstead, (2018) who stated that children with ASD are at a greater risk of developing challenging behavior than children without ASD. Further, this study noted that the best course of treatment for challenging behavior is to first identify the functions of these behaviors. There is also the need to encourage parents and teachers to not only identify but to also openly communicate about challenging behaviors.

Differences between parent and teacher in functions. The study examined differences in the functions of challenging behavior displayed by children with ASD at school between parents' report and teacher's report. Findings showed that the teachers reported higher use of challenging behaviors to seek attention, to avoid or escape a task or environment, get sensory input, self-stimulate and request a tangible item at school as compared to the parents who indicated to a lesser extent that the children with ASD used challenging behaviors for all the five functions. These findings demonstrated that teachers of children with ASD seemed more likely than parents to report the use of challenging behaviors by the children for all functions at the school setting. To further examine if there were differences in the functions of challenging behavior displayed by children with ASD at home between parents' report and teacher's report, the study findings indicated differences existed as reported by the parents and teachers. Interestingly, unlike in the school setting where the teachers reported higher use of the five functions, there were mixed results in the home setting. The parents reported higher use of self-stimulation and to request a tangible item while the teachers reported higher use of the

challenging behaviors to seek attention, to avoid or escape a task or environment and to get sensory input.

For children without ASD, the study findings indicated that there were differences in the functions of challenging behavior at school as reported by parents and teachers. The parents reported the use of challenging behaviors to seek attention, to avoid or escape a task or environment, get sensory input, self-stimulate and request a tangible item. The teachers indicated to a lesser extent that the children without ASD used challenging behaviors for all the five functions. The study further examined if there were differences in the functions of challenging behavior displayed by children without ASD at home between parents' report and teacher's report; findings indicated differences existed as reported by the parents and teachers. The parents indicated the use of challenging behaviors to seek attention, to avoid or escape a task or environment, get sensory input, self-stimulate and request a tangible item. The teachers indicated to a lesser extent that the children without ASD used challenging behaviors for all the five functions at the home setting. These findings are in line with previous studies that indicated that teachers ranked the causes of challenging behaviors as attention seeking, task avoidance, communication problems, stress, interference with routines, and provocation (Porter & Lacey, 2009). In addition, similar to the findings in the present study, past work has revealed that parents of children with ASD have been shown to report the functions of challenging behaviors as to self-stimulate and request a tangible item that they want (Weiss, Wingsiong, & Lunsky, 2014). Moreover, Hart and Whalon, (2013) noted that challenging behaviors are a major concern for young children with ASD or without ASD and both teachers and parents have considered their treatments to be difficult. Therefore, these studies are in line with the present study's

findings demonstrating that parents and teachers perceive the causes of challenging behaviors differently.

   Differences between home and school in functions. The study examined whether there were differences in the functions of challenging behavior displayed by children with ASD and children without ASD at the school setting as reported by parents. Findings indicated that several major differences existed. The study findings showed that the parents reported higher use of challenging behaviors to seek attention, get sensory input, self-stimulate and request a tangible item at school in children with ASD. In children without ASD, the parents indicated to a lesser extent that the children without ASD used challenging behaviors for four functions but used challenging behaviors to avoid or escape a task or environment. Further, for the home setting the parents reported higher use of challenging behaviors to get sensory input, self-stimulation and to request a tangible item among children with ASD while the use of challenging behaviors such as seeking attention, avoiding or escaping a task or environment was reported to be highly used by children without ASD.

   In determining if there were differences in the functions of challenging behavior displayed by children with ASD and children without ASD at the school setting as reported by teachers, the study findings indicated that there were no major differences that existed in comparison to the parents reports. The teachers reported of the use of challenging behaviors to seek attention, get sensory input, self-stimulate and request a tangible item at school in children with ASD. In children without ASD, the teachers indicated that they used challenging behaviors to avoid or escape a task or environment. This finding corresponds to work by Meadan, Ayvazo and Ostrosky, (2016) who also found that children without ASD exhibit challenging behaviors at home and this is a major concern for their parents and families. Further, in the present study,

teachers reported higher use of challenging behaviors in the home setting to seek attention, to avoid or escape a task or environment, to get sensory input, self-stimulation and to request a tangible item among children with ASD. The teachers indicated that children without ASD used all the five functions to a lesser extent than children with ASD. Children without ASD take advantage of challenging behaviors to avoid a task at school. They take advantage of the fact that the teacher may not clearly understand if indeed the challenging behavior is genuine or not. This is unlike at home whereby the parent deeply understands the child and they can tell when a child is avoiding a task (Lefevre, 2014). This may indicate that children without ASD take advantage of challenging behaviors to avoid a task at school however, as Qi and Kaiser (2003) noted in their study challenging behaviors in children without ASD are most likely to be found in children from low-income settings.

O'Nions et al. (2017) noted the extent to which parents manage a child's problematic behavior at home through adapting situations that suit the child. The authors concluded that this then minimizes the need for a child to use challenging behaviors to get attention at home. Machalicek and colleagues (2007) noted that children used challenging behaviors at school hence required interventions to be utilized in decreasing challenging behaviors in the school settings. Further, these study findings are similar to what was reported by Iwata et al. (2000) that teachers are trained and mandated to use functional assessment and analysis to determine challenging behavior in children, hence they were able to easily identify the use of challenging behavior for various functions. Further, the study by Azad and Mandell (2016) indicates that the pervasive nature of autism and its effects on children both at home and at school has led to the easy identification of functions of challenging behaviors in children with ASD by both parents and teachers. According to Horner et al. (2002), children with ASD exhibited challenging

behavior as a means to communicate during various classroom activities. This indicates that the children may use challenging behaviors at school as indicated by teachers in the current study.

Factors predictive of functions of challenging behaviors. When we explored how age, gender, country and diagnosis of ASD predicted each function of challenging behavior at both school and home, none of the independent variables was significantly related to the use of challenging behavior to get attention at school at the .05 level. Being diagnosed with ASD was, however, significantly related to using challenging behavior to avoid or escape a task/environment at school. Being diagnosed with ASD and being male were associated with an increased likelihood in exhibiting challenging behaviors for this function. This result may indicate that the gender of a child with ASD greatly determines their challenging behaviors. A study by Holtz, Fox, and Meurer (2015) revealed that females are associated with passive behaviors, unlike their male counterparts who are aggressive. This indicates that the males are therefore at a greater risk for developing challenging behaviors as compared to the females. Reaven, and Willar (2017) indicated that males are more likely to show certain challenging behaviors especially aggressiveness than females. In addition, Dean, Harwood, and Kasari (2017) indicated that males a slightly likely to show self-injury than females. Together, these findings support the particular need to target challenging behaviors in males who may be at risk for such behaviors.

Use of Evidence-Based Strategies by Parents and Teachers

Differences between Children with and without ASD in Adults' Use of Evidence-Based Strategies. The present study investigated differences in the use of evidence-based strategies between parents and teachers to deal with the challenging behaviors of children with ASD and those without ASD. Interestingly, based on the study findings, there were no

significant differences between parents and teachers in the use of evidence-based strategies to deal with challenging behaviors in children with ASD. The parents indicated the highest means in the use of strategies such as pairing, an adult walking away rather than engaging in a power struggle or support with an appropriate model, encouraging a child to express or verbalize feelings, provide opportunities to be involved such as taking responsibilities/ jobs both at home and school, allowing going to quiet area, allowing moving toward desired element such as light, heat, good smell, providing opportunities for preferred sensory stimulation such as music, object while staying on task, providing snacks . Teachers indicated the highest mean in the use of the strategies which included; reinforcing positive effortful behavior, providing positive attention such as praise and acknowledgement, immediate and frequent feedback on positive behavior, providing correction calmly, immediately and respectfully encouraging communication.

Both parents and teachers collaborating in the use of evidence-based strategies indicated that the top five things included; to change assignments to assist the child's learning, providing a choice of activities within a task or completion of a project, breaking assignments into segments, making adaptations and modification to make task easier/more fun and checking a child's work to assess comprehension.

Webster-Straton and Taylor (2001) found a relationship between challenging behaviors and the use of harsh and punishment strategies to discipline children in both home and school settings. Unfortunately, these strategies utilized at home or at schools to reduce behaviors can lead to increasing stressful and challenging interaction between parents and children (Webster-Stratton & Taylor, 2001). The use of evidence-based strategies can be used to help establish consistent management routines hence create a positive interaction between the parents/teachers and the children. These evidence-based strategies foster healthy social and emotional

development between the children and the parents/teachers (Powell et al., 2006). Research

indicates that social problem solving and modelling strategies significantly encourage positive

behaviors such as empathy for others, self-regulation, and friendship (Powell et al., 2006). No

significant difference was demonstrated between parents and teachers in the use of evidence-

based strategies to deal with challenging behaviors. These strategies help both parents and

teachers to interact with children and foster healthy social and emotional development (Powell et

al., 2006). Powell et al. (2006) revealed that when teachers deliberately and proactively

implement strategies in their classrooms, it helps prevent and reduce challenging behaviors in

students. Horner et al., (2002) indicated that there is a need for parents and teachers to be aware

of a child's routines, when interested in treating challenging behaviors. The present study's

finding that both parents and teachers use evidence-based strategies similarly for children with

ASD may reflect the strong emphasis and growing knowledge in the field of ASD on the

importance of using evidence-based strategies. Indeed, according to Simonsen, Fairbanks,

Briesch, Myers, and Sugai (2008), teachers and parents have used evidence-based strategies to

decrease challenging behaviors. Our investigation of teachers' and parents' use of evidence-

based strategies did not assess how efficacious the adults were in their use of such interventions.

Hart and Whalon (2013) indicated that challenging behaviors are considered particularly difficult

to manage by both teachers and parents if there are no proper interventions for their

management. The current study indicates that parents and teachers used similar evidence-based

strategies to deal with challenging behaviors in children with ASD. Given that this study did not

assess how effectively the adults used such strategies, there is a need for future work to assess

the efficacy of parents and teachers of children with and without ASD to know their knowledge

of how to use evidence-based strategies most effectively to decrease challenging behaviors

(Rahn et al, 2017).

Differences between parents' and teachers' use of evidence-based strategies. With

regard to differences between parents and teachers in the use of evidence-based strategies to deal

with challenging behaviors of children without ASD, the study findings indicated that there was

not a significant difference between teachers and parents in the total number of the evidence-

based strategies used. Parents indicated the highest endorsement of strategies which included;

providing a choice of activities within a task or completion of a project, breaking assignments

into segments, making adaptations and modification to make task easier/more fun, alternating

tasks/assignments, ignore purposefully when showing tantrums or crying, if appropriate,

allowing to work alone and pairing for support with an appropriate model. Teachers indicated the

highest mean in the use of the strategies in children without ASD which included; Provide

opportunities to be involved such as taking responsibilities/ jobs both at home and school, an

adult walking away rather than engaging in a power struggle, allowing going to quiet area,

allowing moving toward the desired element such as light, heat, good smell, providing snacks,

and providing opportunities for preferred sensory stimulation such as music, object while staying

on task.

Murphy et al. (2005) noted that challenging behaviors persist in children with disabilities

who do not receive appropriate interventions. Evidence-based strategies have been shown to be

effective in reducing challenging behaviors significantly (Montgomery et al., 2014). For

example, research indicates that challenging behaviors can be reduced when the features of a

child's social and physical activities have been altered as part of the intervention (Montgomery et

al., 2014). Therefore, as revealed by Meadan and colleagues (2016) it is important to identify the

function of challenging behavior and come up with strategies to decrease challenging behaviors. Research indicates that once the function of the challenging behavior is identified, intervention strategies can be matched accordingly.

According to Rahn et al. (2017) teachers of children with ASD are required to know a variety of evidence-based strategies to decrease challenging behaviors. Therefore, as Powell et al. (2006) stresses there is a need to utilize materials that help to establish consistent management routines and create a positive interaction between the parents/teachers and children. Powell et al. (2006) revealed that when teachers deliberately and proactively implement strategies in their classrooms, it helped prevent and reduce challenging behaviors in students. This study identified the most common strategies reported by parents of children with ASD to help in dealing with challenging behavior as creation of a safe environment where a child can make mistakes, reinforce positive behavior, effortful behavior, provide positive attention such as praise and acknowledgement, encourage communication and immediate and frequent feedback on positive behavior. In addition, the most common strategies reported by teachers of children with ASD to deal with challenging behavior were identified as reinforcing positive effortful behavior, providing positive attention such as praise and acknowledgement, immediate and frequent feedback on positive behavior, providing correction calmly, immediately and respectfully acknowledging an appropriate request for items. Out of all the common strategies reported to help in dealing with challenging behavior the two common strategies identified by both teachers and parents of children with ASD were reinforcing positive effortful behavior, providing positive attention such as praise and acknowledgement. The rest of the strategies differed between the parents and teachers of children with ASD.

Factors predictive of use of evidence-based strategies. This study also sought to understand if age, gender, country and diagnosis of ASD were predictive of the functions of challenging behavior at both school and home. None of the factors was revealed as a significant predictor of the sum of the evidence-based strategies used by parents as well as teachers. Therefore, there is a need for more research to be conducted on the influence of factors such as the age and number of the children receiving interventions, as unexpected difficulties may be experienced when applying strategies that may have previously worked (Horner et al., 2002).

Study Limitations

This study was not without limitations. Study limitations offer an important opportunity for future research to continue this line of work. One of the limitations was that the experimenter designed survey was not tested for reliability and validity. However, a pilot survey was conducted on five teachers and five parents of children with and without ASD. The results of this pilot survey showed that there were differences in the functions of challenging behavior across home and school environments and in the use of evidence-based strategies to deal with challenging behaviors of children with and without ASD as reported by the parents and teachers. Nevertheless, future work should strive to use well-validated measures to investigate this research topic. Another limitation of the survey was the distribution of the survey using snowballing and word-of-mouth. The participants of this study were not chosen from a random sampling. It is likely that the participant who responded and completed the survey might be the ones who were interested in the research topic and were motivated to participate, thus there may have been some selection bias in the participants. Not using the same child's parent and the teacher is another limitation; future work should link the parent and teacher such that they report on behaviors and strategies concerning the same child. Another study limitation was that the

education level of the parents was not taken into account, which may have affected the responses as more educated parents may clearly understand the function of challenging behaviors in their children, unlike uneducated parents. In addition, the teacher's educational background was not considered as teachers with a background in special education are in a position to better understand the function of challenging behaviors in children with and without ASD unlike teachers with no such background. Future research should aim to understand if such parent and teacher characteristics (i.e., education and knowledge about ASD) are associated with their perceptions of the functions of behaviors and their use of evidence-based strategies.

Future Research Recommendations Based on the Study Findings

Based on this study's findings we noted that there were differences in the functions of challenging behavior in children with and without ASD and between home and school environments as reported by parents and teachers. Therefore, there is a need to investigate if there are any similarities in the function of challenging behaviors exhibited by children with ASD and without ASD. None of the factors such as age, gender, country and diagnosis of ASD was revealed as significant predictors of the sum of the evidence-based strategies used by parents as well as teachers. However, in order to advance these research findings, there is need to conduct further research studies to evaluate the differences in the perceptions of the same child's parent and teacher in selecting the functions of challenging behaviors and strategies utilized to decrease those behaviors in children with and without ASD. There is also a need to link the work on behavior functions with that of strategies by investigating the importance of the functions of challenging behavior to the effectiveness of given strategies. Such work would allow for more precisely-tailored recommendations for evidence-based strategies by both teachers and parents of children with and without ASD. Finally, this line of work should further consider exploring the

impact of the teacher's education background since teachers with a background in special education may be better positioned to understand the function of challenging behaviors in children with and without ASD unlike teachers with no such background.

Conclusion and Implications

In conclusion, the study indicated that a reduced percentage of parents, relative to teachers, reported that their children use challenging behaviors to get attention at home or at school. Thus, is because parents are able to manage problematic behavior at home through adapting situations that suit the child which then minimizes the need for a child to use challenging behaviors to get attention at home. In school settings, challenging behaviors can potentially lead to future maladjustment and adult life for both children with and without ASD. Therefore, it is important for professionals across various disciplines to seek resources and training that enable them to identify the functions of challenging behaviors as well as effective interventions to reduce the challenging behaviors. Schools should ensure that teachers are trained and mandated to use functional assessment and analysis to determine challenging behavior in children. By doing so, identification of the use of challenging behavior for various functions will be made easier.

It will be necessary to replicate this study more widely across professionals and caregivers to further advance and strengthen the use of functional analysis procedures and achieve recommendations of accurate strategies to decrease challenging behaviors. There is also a need to encourage parents to work together and to help them to identify and implement the best evidence-based strategies to decrease challenging behaviors. Future research should consider investigating how well the parents and teachers are able to implement the evidence-based

strategies and the impact these strategies actually have on children with and without ASD in different contexts.

The results of this study have several implications. Because the findings indicate that parents and teachers perceive the causes of challenging behaviors differently, the findings indicate that the initial course of treatment for challenging behavior should be to first identify the functions of the behaviors as well as encourage parents and teachers to not only identify but to also openly communicate about the challenging behaviors. Based on parents and teachers views, challenging behaviors are a major concern for young children with and without ASD. It may be useful for interventions to be developed to support parents and teachers to develop more effective partnerships as they work together to address children's behaviors. Use of evidence-based strategies can help establish consistent management routines which create a positive interaction between the parents/teachers and the children. In addition, they can foster healthy social and emotional relationships between the children and the parents/teachers.

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Appendix A

TEACHERS COLLEGE
COLUMBIA UNIVERSITY

Teachers College IRB   *Exempt Study Approval*

To: Suzzanna Javed

From: Curt Naser, TC IRB Coordinator

Subject: IRB Approval: 17-228 Protocol

Date: 03/16/2017

Thank you for submitting your study entitled, "*Strategies for Decreasing Challenging Behaviors of Children with or without Autism*;" the IRB has determined that your study is **Exempt** from committee review (Category **2**) on 03/16/2017.

Please keep in mind that the IRB Committee must be contacted if there are any changes to your research protocol. The number assigned to your protocol is **17-228**. Feel free to contact the IRB Office by using the "Messages" option in the electronic Mentor IRB system if you have any questions about this protocol.

As the consent process is done online, no stamped copy of the approved consent form is provided with this approval. Further, all research recruitment materials must include the study's IRB-approved protocol number. You can retrieve a PDF copy of this approval letter from the Mentor site.

Best wishes for your research work.

Sincerely,
Curt Naser, Ph.D.
TC IRB Coordinator
curtn@axiomeducation.com

Appendix B

Teachers College, Columbia University

525 West 120th Street New York NY 10027

 212 678 3000

TC IRB Protocol number (17-228)

Recruiting Participants for Study:

Strategies for Decreasing Challenging Behaviors of Children with or without ASD

Who:

a) parent of one or more than one child with or without ASD between 2 to 10 years,

b) teacher (special and general education) who has taught one or more students with or

withoutASD between 2 to 10 years.

The survey would take approximately 15-17 minutes.

What: Complete an anonymous survey about functions of your child challenging behaviors and

strategies utilized to decrease the behaviors.

In appreciation of your participation in this study, you may elect to be entered into a random

drawing to

receive a $10 Starbucks gift card (1 in 25 chances of winning).

Contact: Suzzanna Javed PhD Candidate, email: annajaved82@gmail.com for more information

about this study.

TEACHERS COLLEGE, COLUMBIA UNIVERSITY INSTITUTIONAL REVIEW BOARD

Teachers College, Columbia University

525 West 120th Street New York NY 10027 212 678 3000

Appendix C

TEACHERS COLLEGE, COLUMBIA UNIVERSITY INSTITUTIONAL REVIEW BOARD

Teachers College, Columbia University

525 West 120th Street

New York, NY 10027

(212) 678-3000

www.tc.edu

IRB Approval: 17-228 Protocol

INFORMED CONSENT

Protocol Title: Strategies for Decreasing Challenging Behaviors of Children with or without

ASD

Principal Investigator: Suzzanna Javed, Doctoral Candidate - Teachers College, Columbia

University (646) 373-6844

INTRODUCTION

You are being invited to participate in this research study called "Strategies for

Decreasing Challenging Behaviors of Children with or without ASD." You may qualify to take

part in this research study because you (a) are a parent of one or more than one child with or

without ASD between ages 2½ to 10 years b) teacher who has taught one or more students with

or without ASD between ages 2½ to 10 years. This study will take 10-15 minutes of your time to

complete.

WHY IS THIS STUDY BEING DONE?

The purposes of this research are to: (a) identify the differences between teachers and parents in using the evidence-based strategies to decrease challenging behaviors of children with or without ASD (b) understand different functions of challenging behavior across home and school environments of children with or with ASD.

WHAT WILL I BE ASKED TO DO IF I AGREE TO TAKE PART IN THIS STUDY?

If you decide to participate, you will respond to survey items about strategies you have used to decrease challenging behaviors of children with or without ASD and questions about behavior functions. Survey items will be presented using the on-line survey platform, SurveyMonkey.

WHAT POSSIBLE RISKS OR DISCOMFORTS CAN I EXPECT FROM TAKING PART IN AATHIS STUDY?

This is a minimal risk study, which means the harms or discomforts that you may experience are not greater than you would ordinarily encounter in daily life while taking routine physical or psychological examinations or tests. You can refuse to participate, decline to answer specific items, or withdraw your participation at any time.

WHAT POSSIBLE BENEFITS CAN I EXPECT FROM TAKING PART IN THIS STUDY?

There is no direct benefit to you for participating in this study. However, an indirect benefit is that the findings of this study may provide important information for educators and parents about evidence based strategies and behavior functions.

WILL I BE PAID FOR BEING IN THIS STUDY?

You will not be paid to participate; however, you may choose to enter a lottery to receive one of several $10.00 Starbucks e-gift cards. The chances of winning the lottery are approximately 1 in 25. Participants will qualify for this incentive upon completion of the survey, even if they refuse

to answer individual survey items. Individuals who refuse to participate, or withdraw from participation altogether, will not qualify for the aforementioned incentive.

WHEN IS THE STUDY OVER? CAN I LEAVE THE STUDY BEFORE IT ENDS?

The study is over when you have completed the survey. However, you can leave the study at any time, even if you haven't finished.

Please take the survey titled "Challenging Behaviors ". Your feedback is important! surveymonkey.com/r/MJWP72R

Appendix D

1. A Survey for Parents and Teachers about Challenging Behaviors of Children With or Without Autism

Teachers College, Columbia University
525 West 120th Street
New York, NY 10027
(212) 678-3000
www.tc.edu

IRB Approval: 17-228 Protocol

INFORMED CONSENT

Protocol Title: Strategies for Decreasing Challenging Behaviors of Children with or without Autism
Principal Investigator: Suzzanna Javed, Doctoral Candidate - Teachers College, Columbia University (646) 373-6844

INTRODUCTION

You are being invited to participate in this research study called "Strategies for Decreasing Challenging Behaviors of Children with or without Autism." You may qualify to take part in this research study because you (a) are a parent of one or more than one child with or without autism between ages 2 to 10 years b) teacher who has taught one or more students with or without autism between ages 2 to 10 years. This study will take 10-15 minutes of your time to complete.

WHY IS THIS STUDY BEING DONE?

The purposes of this research are to: (a) identify the differences between teachers and parents in using the evidence-based strategies to decrease challenging behaviors of children with or without autism (b) understand different functions of challenging behavior across home and school environments of children with or with autism.

WHAT WILL I BE ASKED TO DO IF I AGREE TO TAKE PART IN THIS STUDY?

If you decide to participate, you will respond to survey items about strategies you have used to decrease challenging behaviors of children with or without autism and questions about behavior functions. Survey items will be presented using the on-line survey platform, SurveyMonkey.

WHAT POSSIBLE RISKS OR DISCOMFORTS CAN I EXPECT FROM TAKING PART IN THIS STUDY?

This is a minimal risk study, which means the harms or discomforts that you may experience are not greater than you would ordinarily encounter in daily life while taking routine physical or psychological examinations or tests. You can refuse to participate, decline to answer specific items, or withdraw your participation at any time.

WHAT POSSIBLE BENEFITS CAN I EXPECT FROM TAKING PART IN THIS STUDY?

There is no direct benefit to you for participating in this study. However, an indirect benefit is that the findings of this study may provide important information for educators and parents about evidence based strategies and behavior functions.

WILL I BE PAID FOR BEING IN THIS STUDY?

You will not be paid to participate; however, you may choose to enter a lottery to receive one of several $10.00 Starbucks e-gift cards. The chances of winning the lottery are approximately 1 in 25. Participants will qualify for this incentive upon completion of the survey, even if they refuse to answer individual survey items. Individuals who refuse to participate, or withdraw from participation altogether, will not qualify for the aforementioned incentive.

WHEN IS THE STUDY OVER? CAN I LEAVE THE STUDY BEFORE IT ENDS?

The study is over when you have completed the survey. However, you can leave the study at any time, even if you haven't finished.

2.

PROTECTION OF YOUR CONFIDENTIALITY

The list of participants' e-mail addresses will be kept on a password-protected computer and cannot be linked to the coded data. The SurveyMonkey account belongs to the principal investigator and is password protected. For information on SurveyMonkey's security policies, please visit https://www.surveymonkey.com/mp/policy/security/. Regulations require that research data be kept for at least three years.

HOW WILL THE RESULTS BE USED?

The results of this study will be published in journals and presented at academic conferences. Data from individuals who withdraw their participation will be deleted and will not be used. This study is being conducted as part of the dissertation of the principal investigator.

WHO CAN ANSWER MY QUESTIONS ABOUT THIS STUDY?

If you have any questions about taking part in this research study, you should contact the principal investigator, Suzzanna Javed, 646-373-6844
or at annajaved82@gmail.com. You can also contact the faculty advisor, Dr. Hsu-Min Chiang at hchiang@tc.columbia.edu.

If you have questions or concerns about your rights as a research subject, you should contact the Institutional Review Board (IRB) (the human research ethics committee) at (212) 678-4105 or e-mail IRB@tc.edu. Or, you can write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY 10027. The IRB is the committee that oversees human research protection for Teachers College, Columbia University.

3.

PARTICIPANTS' RIGHTS

Principal Investigator: Suzzanna Javed
Protocol Title: Strategies for Decreasing Challenging Behaviors of Children with or without Autism

I have read the informed consent. If I have questions regarding the purposes and procedures regarding this study, I may e-mail the principal investigator who will answer my questions (annajaved82@gmail.com).
I understand that my participation is voluntary. I may refuse to participate, decline to answer specific items, or withdraw from participation at any time without penalty.
The principal investigator may withdraw me from the research at his professional discretion (i.e., if the participant does not meet the inclusion criteria outlined in the study.)
If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue my participation, the principal investigator will provide this information to me.
Any information derived from the research project that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
If, at any time, I have questions regarding the research or my participation, I can contact the principal investigator, Suzzanna Javed will answer my questions. The principal investigator's e-mail address is annajaved82@gmail.com.
If, at any time, I have comments or concerns regarding the conduct of the research or questions about my rights as a research subject, I should contact the Teachers College, Columbia University Institutional Review Board (IRB). The phone number for the IRB is (212) 678-4105. Or, I can write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY 10027, Box 151.
I should print or save a copy of the Research Description and this Participants' Rights document.

* **Do you agree to participate in this study?**

◯ Yes, I agree to participate. (Please continue)

◯ No, I do not agree to participate. (Please stop here.)

4. Challenging Behaviors

In order to qualify for this study, you must:

a) parent of one or more than one child with or without autism between the ages of 2 to 10 years,
b) teacher (special and general education) who has taught one or more students with or without
autism between the ages of 2 to 10 years.
Please do not proceed, if you do not meet these qualifications.

* Do you meet the above qualifications?

○ Yes.

○ No. (Please stop.)

5. Demographic information

* Are you the child's mother, father, guardian, teacher or other?

○ Mother

○ Father

○ Guardian

○ Teacher

○ Both a teacher and a parent

○ Other (please specify)

[   ]

* What is your child's gender

○ Male

○ Female

○ Other

* What is your child's/student's age?

○ 2

○ 3

○ 4

○ 5

○ 6

○ 7

○ 8

○ 9

○ 10

* Please indicate the country that your child/student lives in:

○ United States of America

○ Other (please specify)

[   ]

* If you live in the US, please indicate your State or Territory

[   ]

* Does your child/student have autism?

( ) He/She has been diagnosed with autism.

( ) He/She does not have autism.

What does your child use challenging behavior for at school ? (Pick all that applies)

[ ] To get attention.

[ ] To avoid or escape a task or environment.

[ ] To get sensory input (tactile, auditory etc.)

[ ] Self-Stimulation

[ ] To request a tangible item.

[ ] I don't know

What does your child use challenging behavior for at home? (Pick all that applies)

[ ] To get attention

[ ] To avoid or escape a task

[ ] To get sensory input (tactile, auditory etc.)

[ ] Self-stimulation

[ ] to request a tangible item

[ ] I don't know

6.

Strategies for Decreasing Challenging behavior. For each of the strategies listed below, pleased indicate the frequency of the strategy that you have used on your child/student using the following scale.

often
sometimes
seldom
never

[The strategies used in this survey are taken from *Behavior Interventions in a Response to Instruction and Intervention (RtI2) Model Handbook*, (2011)].
Mantooth, S. (2011). *Behavior Interventions in a Response to Instruction and Intervention (RtI2) Model Handbook*. Ventura County, CA.

* Both parents and teachers collaborate to change assignments to assist a child's learning

○ Often

○ Sometimes

○ Seldom

○ Never

* Providing a choice of activities within a task or completion of a project

○ Often

○ Sometimes

○ Seldom

○ Never

* Breaking assignments into segments

○ Often

○ Sometimes

○ Seldom

○ Never

* Making adaptations and modification to make task easier/more fun

  ◯ Often

  ◯ Sometimes

  ◯ Seldom

  ◯ Never

* Checking a child's work to assess comprehension

  ◯ Often

  ◯ Sometimes

  ◯ Seldom

  ◯ Never

* Alternating tasks/assignments (easy/ difficult)

  ◯ Often

  ◯ Sometimes

  ◯ Seldom

  ◯ Never

* Giving permission to a child to move away from non-preferred person

  ◯ Often

  ◯ Sometimes

  ◯ Seldom

  ◯ Never

* Ignore purposefully when showing tantrums or crying

  ◯ Often

  ◯ Sometimes

  ◯ Seldom

  ◯ Never

* If appropriate, allowing to work alone

○ Often

○ Sometimes

○ Seldom

○ Never

* Reducing the number of people who are required to work together (small groups for activities)

○ Often

○ Sometimes

○ Seldom

○ Never

* Pairing for support with an appropriate model (peer/sibling/cousin/friend)

○ Often

○ Sometimes

○ Seldom

○ Never

7.

* Provide a self-monitoring checklist at home/school

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Encourage a child to express or verbalize feelings

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Create a safe environment where a child can make mistakes

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Rewarding a child to complete non-preferred task

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Prompting to ask for help prior to a stressful situation

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Limiting number of "escapes" or number of times they can avoid a task per day

    ◯ Often

    ◯ Sometimes

    ◯ Seldom

    ◯ Never

* Providing an opportunity to a child to avoid or escape a task

    ◯ Often

    ◯ Sometimes

    ◯ Seldom

    ◯ Never

* Reinforcing positive effortful behavior (For example, a child/ student is working hard to complete a task)

    ◯ Often

    ◯ Sometimes

    ◯ Seldom

    ◯ Never

8.

* Teaching strategies such as breathing/relaxation to reduce stress

- ◯ Often
- ◯ Sometimes
- ◯ Seldom
- ◯ Never

* Encouraging appropriate attempts for attention

- ◯ Often
- ◯ Sometimes
- ◯ Seldom
- ◯ Never

* Use socially active peers who speak clearly, use eye contact and observe appropriate distance, to model and reinforce appropriate behavior

- ◯ Often
- ◯ Sometimes
- ◯ Seldom
- ◯ Never

* Timer to set for short periods

- ◯ Often
- ◯ Sometimes
- ◯ Seldom
- ◯ Never

* Provide positive attention such as praise and acknowledgement

- ◯ Often
- ◯ Sometimes
- ◯ Seldom
- ◯ Never

* Provide opportunities to be involved such as taking responsibilities/ jobs both at home and school

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Providing frequent turns (answering questions, turn-taking while playing a game etc.)

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Encourage communication (listening and speaking)

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Give high fives

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Immediate and frequent feedback on positive behavior (giving a hug, vocal praise, pat on the back etc.)

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Providing correction calmly, immediately and respectfully

○ Often

○ Sometimes

○ Seldom

○ Never

* an adult walking away rather than engaging in a power struggle

○ Often

○ Sometimes

○ Seldom

○ Never

9.

* Provide a child/student waiting time before making another request

○ Often

○ Sometimes

○ Seldom

○ Never

* Allowing a child to adjust seats, positions if needed for sensory reasons

○ Often

○ Sometimes

○ Seldom

○ Never

* Allowing stretch breaks

○ Often

○ Sometimes

○ Seldom

○ Never

* Allowing a child to stand and work

○ Often

○ Sometimes

○ Seldom

○ Never

* Allowing "wiggle cushion", heavy rubber bands, "squish balls", weighted lap pad, tilted chair, slant board, bean bag chairs

○ Often

○ Sometimes

○ Seldom

○ Never

* Acknowledge the sensory need when asked appropriately (remove it, provide headphones, change of seating, reduce volume)

○ Often

○ Sometimes

○ Seldom

○ Never

* Allowing going to quiet area

○ Often

○ Sometimes

○ Seldom

○ Never

* Reducing over stimulating distractions

○ Often

○ Sometimes

○ Seldom

○ Never

10.

* Talking to children about change in the plan and possible emergency change in plans

○ Often

○ Sometimes

○ Seldom

○ Never

* Providing multi-sensory (audio, visual and tactile etc.) instructional strategies

○ Often

○ Sometimes

○ Seldom

○ Never

* Allowing moving toward desired element such as light, heat, good smell

○ Often

○ Sometimes

○ Seldom

○ Never

* Providing opportunities for preferred sensory stimulation such as music, object while staying on task

○ Often

○ Sometimes

○ Seldom

○ Never

* Providing access to preferred item to hold while completing a task (younger child can hold a small toy)

○ Often

○ Sometimes

○ Seldom

○ Never

* Providing snacks

- ◯ Often
- ◯ Sometimes
- ◯ Seldom
- ◯ Never

11.

* Providing motivating activities to choose from when bored/overwhelmed

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Acknowledging appropriate requests for items

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Having more than one preferred choice from which to select

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

* Keeping distracting items out of sight

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

12.

* Providing rules and guidelines to a child for the items which may create dispute

○ Often

○ Sometimes

○ Seldom

○ Never

* Providing visual schedule (For example, token board)

○ Often

○ Sometimes

○ Seldom

○ Never

* Using visual prompt (For example, highlighting)

○ Often

○ Sometimes

○ Seldom

○ Never

* Using verbal prompt

○ Often

○ Sometimes

○ Seldom

○ Never

* Using physical prompts

○ Often

○ Sometimes

○ Seldom

○ Never

If there are any additional strategies that you have used please mention them here.

Provide email to participate in the lottery