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Child Characteristics and Parent Factors in Children with ASD and/or ADHD: Disruptive Behaviors, Internalizing Symptoms, Parental Distress, and Parenting Practices

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CHILD CHARACTERISTICS AND PARENT FACTORS IN CHILDREN WITH ASD AND/OR ADHD: DISRUPTIVE BEHAVIORS, INTERNALIZING SYMPTOMS, PARENTAL DISTRESS, AND PARENTING PRACTICES

by

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ABSTRACT

CHILD CHARACTERISTICS AND PARENT FACTORS IN CHILDREN WITH ASD AND/OR ADHD: DISRUPTIVE BEHAVIORS, INTERNALIZING SYMPTOMS, PARENTAL DISTRESS, AND PARENTING PRACTICES

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The current study examined disruptive behaviors, internalizing symptoms, parental distress, and parenting practices in children with autism spectrum disorder (ASD), attention-deficit/hyperactivity disorder (ADHD), ASD+ADHD, and typically-developing (TD) children. Specifically, the current study examined how those factors differed according to diagnostic group as well as how child characteristics (i.e., disruptive behaviors and internalizing symptoms) were related to parental factors above and beyond specific symptoms of ASD and ADHD (examined dimensionally). To examine those questions, parents of 14 children with ASD, 16 children with ADHD, 13 children with ASD+ADHD, and 15 TD children participated in the current study (total $N = 58$). They completed various online measures regarding their child's diagnostic symptoms and functioning as well as self-report measures assessing their own distress levels and use of various specific parenting practices. Analyses of variance (ANOVAs) and analyses of covariance (ANCOVAs) were conducted to examine group differences, and regression analyses were conducted to examine unique variance in parental factors accounted for by child characteristics. Although many of the hypotheses were not supported, some of the relevant findings of this study include the following: Children with an ADHD diagnosis—with or without comorbid ASD—exhibited higher levels of disruptive

behaviors than other children; children with an ADHD diagnosis generally exhibited higher levels of internalizing symptoms than other children; parents of children with dual diagnoses (ASD+ADHD) generally demonstrated the highest levels of parental distress, although not significantly more than parents of children with ADHD (and group effects were nonsignificant when accounting for control variables); and inconsistent discipline was related to ADHD diagnoses and child disruptive behaviors. Limitations of the study and suggestions for further research are discussed.

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I – INTRODUCTION

Children with ASD and ADHD

According to the most recent reports from the Centers for Disease Control (CDC; 2010 & 2013), about 1 in 68 children have been diagnosed with autism spectrum disorder (ASD), and about 1 in 9 children aged 4 to17 years have been diagnosed with attention-deficit/hyperactivity disorder (ADHD). Comorbidity of both of these disorders appears to be fairly common (Jang et al., 2013), but specific information about the comorbid prevalence rates is lacking. This lack of comorbidity information is likely due to the fact that although ASD and ADHD have been dually diagnosed in clinical practice under the *DSM-IV-TR*, technically, a diagnosis of ADHD was not permitted to be given if a diagnosis of autism was already present under *DSM-IV-TR* criteria (American Psychiatric Association, 2000; Jang et al., 2013). It was not until the release of the *Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition* (*DSM-5*; American Psychiatric Association, 2013) that ASD and ADHD were recognized as being comorbid disorders that could be diagnosed together.

Because of the relatively high prevalence of these disorders and the fact that their symptoms emerge early in childhood, it naturally follows that many families and parents of children diagnosed with either of these disorders are affected by their children's symptoms for many years. For example, parents of children with ASD experience higher levels of depression, anxiety, and stress than the general population (Bitsika & Sharpley, 2004), and mothers of children with ADHD have been found to experience more depression and anxiety than mothers of typical children (Segenreich, Fortes, Coutinho, Pastura, & Mattos, 2009). In addition, parents of adolescents with ADHD experience

more parenting stress than parents of adolescents without ADHD (Wiener, Biondic, Grimbos, & Herbert, 2016). These findings may be partially reflective of the characteristics associated with their children's disorders. Research has begun to more closely examine how child characteristics associated with these disorders are related to particular parent stress levels, characteristics, and behaviors. However, there are still questions remaining with regard to what particular child symptoms relate to specific parent behaviors and parental mental health. The current study investigated differences in child problem behaviors (disruptive behaviors and internalizing symptoms) in children with ASD, ADHD, comorbid ASD and ADHD (noted as ASD+ADHD for the current study), and typically-developing (TD) children to better understand how child characteristics may differ depending on diagnostic status. In addition, the current study examined how parent depression, anxiety, and stress levels as well as parenting practices differ depending on diagnostic group. Finally, the study investigated how child problem behaviors (disruptive behaviors and internalizing symptoms) predict parent outcomes in the presence of ASD and/or ADHD symptoms. These findings can aid clinicians who work with families of children with ASD and/or ADHD better understand how to improve treatment outcomes for both children and parents.

According to the *DSM-5*, children with ASD exhibit social communication difficulties that include problems with social-emotional reciprocity, nonverbal communication, and social relationships. In addition, they display restricted interests or repetitive behaviors that may be characterized by stereotyped speech, obsessions, adherence to routines, and sensory sensitivities (American Psychiatric Association, 2013). Children with ADHD exhibit many symptoms of inattention (such as difficulties

following through on work, sustaining attention, focusing, or organizing) and/or hyperactivity (such as fidgeting, being constantly "on the go," interrupting, and having difficulties remaining seated). Children with ADHD can experience inattentive symptoms (predominantly inattentive presentation), hyperactive/impulsive symptoms (predominantly hyperactive/impulsive presentation), or both (combined presentation; American Psychiatric Association, 2013). Children with ASD and ADHD experience impairment in daily life due to their particular symptom constellation (American Psychiatric Association, 2013).

Despite the fact that the symptoms of ASD and ADHD are unique, many children with an ASD or ADHD diagnosis exhibit similar disruptive behavior problems. For the current study, disruptive behaviors were defined as aggression, acting out, conduct problems, and noncompliance. Children with ADHD often display high levels of disruptive behavior problems (Mash & Barkley, 2003), and children with ASD often experience disruptive behavior problems as well, especially defiance, aggression, and escape behaviors (Sikora et al., 2013). These disruptive behavior problems are often the target of treatments for children with ASD and ADHD, because they contribute to difficulties in daily life.

Internalizing symptoms, which are characterized by anxious, depressive, worry, and mood symptoms (Achenbach & McConaughy, 1992), also are often found in children with ASD and ADHD. A study conducted by Kim, Szatmari, Bryson, Streiner, and Wilson (2000) found that high-functioning children with ASD were more likely to experience anxiety and mood problems than TD peers. Similarly, individuals with ADHD are more likely than individuals within the general population to experience

anxiety disorders and major depressive disorder (American Psychiatric Association, 2013). Research has begun to examine how these disruptive behaviors and internalizing symptoms in children with ASD and/or ADHD relate to parent stress levels, psychopathology, and parenting practices.

Disruptive Behaviors and Internalizing Symptoms in Children with ASD and Parental Distress

The symptoms of ASD as well as the associated disruptive behaviors and internalizing symptoms displayed by many of these children have been found to relate to parent stress levels and parental mental health. For example, Pozo and Sarria (2014) found that ASD symptom severity (defined as the total score on the *Childhood Autism Rating Scale*; CARS), as well as the specific problem behaviors of self-injury, stereotyped behaviors, and aggressive behaviors (as assessed by the three subscales of the *Behavior Problems Inventory*; BPI), were associated with elevated levels of parenting stress among parents of individuals with ASD. There is conflicting evidence within the literature regarding whether it is the ASD symptoms themselves or the associated disruptive behaviors and internalizing symptoms that are primarily associated with parental distress. Some studies have found that a variety of factors including ASD symptoms themselves and specific child behavior problems relate to poor parental mental health. For example, Falk, Norris, and Quinn (2014) studied children ages 4 to 17 years with ASD. They examined child characteristics as well as a variety of other factors (such as social support, parental locus of control, etc.) that relate to parent stress and mental health levels. When solely investigating child characteristic variables within the more complex models, aggressive behavior was related to maternal depression, ASD symptom

severity was related to maternal anxiety and stress, and aggression was related to paternal anxiety. Benson (2006) found that child ASD symptomatology was related to parent depression levels, and this association was partially mediated by "stress proliferation" (the "pile-up" of secondary stressors related to their child's ASD symptoms, such as financial difficulties, work difficulties, and spousal difficulties).

In contrast, other studies emphasize that disruptive behaviors and internalizing symptoms rather than ASD symptomatology are primarily responsible for parental distress. For example, Hastings et al. (2005) found that although both ASD symptom severity and problem behaviors related to maternal stress in preschoolers with ASD, only child behavior problems (not ASD symptom levels or adaptive behaviors) predicted maternal anxiety and depression ratings and paternal stress ratings in a sample of preschool children with ASD. In their study, Hastings and colleagues asked mothers and fathers to complete the Autism Screening Questionnaire (ASQ) to assess their child's ASD severity. To assess "problem behaviors," the parents completed the Developmental Behavior Checklist (DBC), a measure specifically developed to assess problem behaviors in children with developmental disabilities. The total score on this measure was used to assess the problem behaviors and tapped emotional and behavioral problems, such as disruptive behaviors, self-absorbed behaviors, anxious behaviors, communication difficulties, and antisocial behaviors. However, the total score of this measure also included a subscale of "Autistic Relating" difficulties, which included items such as being aloof and avoiding eye contact. This overlap may somewhat confound the intent to separate problem behaviors from ASD severity in their study; however, because the autistic subscale only included eight of the 96 total problem behaviors assessed by the

DBC, it is likely that the measure generally tapped problem behaviors separate from ASD symptoms.

Hastings et al. (2005) assessed stress levels with the Parent and Family Problems subscale of the Questionnaire on Resources and Stress - Freidrich Short Form (QRS-F), assessing situations, such as whether the child with ASD fits into the family and whether the parents and family members had to do without things because of the child with ASD (items on this subscale that overlapped with depression symptoms were removed to reduce confounds with the depression measure). The Hospital Anxiety and Depression scale (HADS) was used to assess anxiety and depression. ASD symptom severity was only found to relate to mother's reported stress levels, but overall problem behaviors, which primarily included disruptive behavior problems and internalizing symptoms, were associated with mothers' own anxiety ratings, depression ratings, and stress levels as well as with fathers' own stress levels. Based on these results, it appears as if disruptive behaviors and internalizing symptoms may more frequently relate to poor parental mental health (especially maternal mental health) than ASD symptoms.

Similarly, Estes et al. (2009) found that psychological distress and parenting stress in parents of preschoolers with either ASD or developmental delays were related to the extent of their children's problem behaviors as assessed by the Aberrant Behavior Checklist (ABC) but were not related to their child's specific diagnostic group or daily living skill abilities. Problem behaviors were defined as irritability, social withdrawal, stereotypic behavior, hyperactivity, and inappropriate speech. These problem behaviors, rather than ASD diagnostic group status, related to parent psychological distress (as

assessed by a composite of the Anxiety and Depression subscales of the Brief Symptom Inventory; BSI)), and parenting stress (as assessed by the QRS).

In addition to parent difficulties being associated with disruptive behaviors in children with ASD, research has suggested that child internalizing symptoms are related to parent difficulties as well. For example, Mazefsky, Conner, and Oswald (2010) examined internalizing symptoms in children aged 10 to 17 years with an ASD diagnosis. They found that their mothers' mood symptoms could be used to predict whether or not their child had experienced a comorbid depressive or anxiety disorder. Specifically, the researchers found that 75% of the children could be correctly designated as having or not having a mood disorder history based on their mother's reported anxious, depressive, and hostile symptoms as well as interpersonal difficulties. These results suggest that parental depressive or anxious symptoms are related to child internalizing symptoms in children with ASD. However, limited research into the association between internalizing symptoms in children with ASD and parent stress levels reveals a need for further research in this area.

In summary, it appears that although ASD symptomatology impacts parental distress to a certain extent, child disruptive behaviors and internalizing symptoms are more robust predictors of parental distress in this population. The current study sought to confirm these findings and specifically examined the question of whether overall levels of child disruptive behaviors and internalizing symptoms relate to current, acute levels of parental distress. In addition, the current study examined disruptive behaviors and internalizing symptoms as separate criterion variables in all analyses, providing more specific information about each variable.

In examining such questions, it is important to remain cognizant that many children with ASD also have cognitive deficits or adaptive delays. Therefore, the question of whether those factors impact parental distress levels is also relevant. However, most research appears to suggest that cognitive and adaptive functioning level is not related to parental distress above and beyond child behavior problems. For example, in a study conducted by Peters-Scheffer, Didden, and Korzilius (2012), mothers of children with ASD and intellectual disability (ID) were assessed. The children's cognitive and adaptive functioning levels were not related to parenting stress (as assessed by the PSI), and ASD symptoms were only marginally related to parenting stress. Behavioral and emotional problems (as assessed by the Child Behavior Checklist; CBCL) in the children, however, were associated with parenting stress with large effect sizes (Peters-Scheffer et al., 2012). In addition, Brei, Schwarz, and Klein-Tasman (2015) found that parenting stress levels among parents whose toddlers were being evaluated for an ASD diagnosis were most strongly related to their children's problem behaviors and were not uniquely related to their children's cognitive functioning level. Similarly, Davis and Carter (2008) found that neither cognitive nor verbal functioning were strong predictors of stress for parents of toddlers with ASD. However, because the current study investigated children with and without ASD who had the potential to significantly differ from each other with respect to adaptive functioning, the adaptive functioning level of each child was assessed. This approach enabled the researcher to ensure that differences in daily living abilities did not account for differences in parenting practices or parent depression, anxiety, or stress levels.

Disruptive Behaviors and Internalizing Symptoms in Children with ADHD and Parental Distress

Parents of children with ADHD or high levels of hyperactivity often experience significant levels of stress as well (Anastopoulos, Guevremont, Shelton, & DePaul, 1993; Mash & Johnston, 1983: Theule, Wiener, Tannock, & Jenkins, 2013). A meta-analysis conducted by Theule et al. (2013) examined a variety of studies researching the associations among child, parent, and/or environmental factors and stress in parents of children with ADHD. The authors found that parents of children with ADHD reported more parenting stress than parents of control children, but there were not overall significant differences in most types of parenting stress when parents of children with ADHD were compared to parents of children with other clinical disorders. This result suggests that it may be problem behaviors that are present in a variety of disorders that are associated with parenting stress. For example, the meta-analysis found that disruptive behaviors and internalizing symptoms in children with ADHD were linked to parenting stress, and these symptoms are found in a variety of disorders. Nonetheless, the meta-analysis also found that ADHD symptoms themselves—inattentive symptoms and hyperactive/impulsive symptoms, also predicted parenting stress levels.

In contrast, a review article conducted by Deault (2010) concluded that it is primarily the disruptive behaviors that are associated with parenting stress and parent psychopathology rather than ADHD symptoms themselves. Deault examined many studies from 2000-2008 that investigated ADHD in children and parent/family outcomes. In general, the results of this review suggested that parent stress, family conflict, and parent psychopathology were more closely tied to oppositional behaviors or conduct

problems in children with ADHD than their particular ADHD symptoms. However, the directionality remained in question.

As a particular example, one of the studies included in this review, closely examined child symptoms and maternal mental health outcomes (Chronis et al., 2003). Specifically, children aged 3 to 7 years with ADHD only, ADHD and oppositional defiant disorder (ODD) or conduct disorder (CD), and non-ADHD control children were tested. Their mothers completed the Disruptive Behaviors Checklist to assess their child's ADHD, ODD, and CD symptoms, and they also completed the NIMH Diagnostic Interview Schedule for Children (DISC) and Children's Impairment Rating Scale (CIRS) to assess problem severity. Mothers' mental health was assessed via the Structured Clinical Interview for *DSM-III-R*, Non-Patient Edition (SCIDNP) and the Beck Depression Inventory (BDI). Findings showed that parents of children with only ADHD were not more likely to have mood problems. Parents of children with ADHD and ODD/CD, however, exhibited more mood, anxiety, and substance use disorders. These findings suggest that it may be the disruptive behaviors that are often associated with ADHD that are more strongly linked with poor parental mental health than the ADHD symptoms themselves.

Harrison and Sofronoff (2002) studied children with ADHD and their mothers. These authors measured child behavior problems using the total score on the Child Behavior Checklist (CBCL) and used the Home Situations Questionnaire-Revised (HSQ-R) to assess difficulties with concentration and attention. The HSQ-R also was used as the measure of ADHD symptom severity. Mothers recorded their levels of parenting stress with the PSI and levels of depression with the BDI. Results showed that ADHD

severity was associated with parenting stress levels, but total score on the CBCL (which broadly assesses externalizing and internalizing behavior problems) was associated with parenting stress levels and maternal depression. In addition, regression analyses showed that the externalizing and internalizing behavior scores uniquely predicted parenting stress, whereas ADHD symptom severity was not a unique predictor. Similar results were found for levels of depression in mothers. Harrison and Sofronoff's findings suggest that problem behaviors, likely externalizing and/or internalizing symptoms, relate to parent stress and distress levels to a more significant degree than ADHD symptoms themselves.

A more recent study, not included in the aforementioned review, found overall higher levels of psychopathology among parents of children with ADHD. Specifically, Segenreich et al. (2009) compared levels of depression and anxiety in parents of elementary-aged and middle school-aged children with ADHD with the levels of parents of control children. Mothers of children with ADHD reported more depressive and trait anxiety symptoms (but not state anxiety levels) than mothers of children without ADHD, but significant associations were not present for fathers. However, the Segenreich et al. study is limited in that, although it found increased levels of depression and anxiety in mothers of children with ADHD, it did not consider what types of symptoms or child characteristics were associated with the parental distress levels. Therefore, it is unclear from their study whether the ADHD symptoms or other child characteristics, such as disruptive behavior problems or internalizing symptoms, related to those outcomes.

In general, the literature shows that disruptive behaviors in children with ADHD are associated with negative parental mental health outcomes. When internalizing

symptoms are specifically examined, however, the answers are less clear. This ambiguity is primarily due to the fact that internalizing symptoms have not been studied as extensively as externalizing behaviors in children with ADHD, so less is known about their relation to parental factors. Although no studies examining parent factors and internalizing symptoms in children with only an ADHD diagnosis could be found, two studies examining parent outcomes among children with ADHD and comorbid anxiety or depressive disorders were found. These studies provide some insights into the association between internalizing symptoms in children with ADHD and parental mental health.

Harris, Boots, Talbot, and Vance (2006) tested mothers of school-aged children with ADHD-combined type and ADHD-combined type and dysthymic disorder. The mothers completed the Hopkins Symptom Checklist (HSCL) which assessed 5 dimensions of symptoms: somatization, obsessive-compulsive, interpersonal sensitivity, anxiety, and depression. Mothers of children with comorbid ADHD-combined type and dysthymic disorder reported higher levels of anxiety and depression than children in the ADHD-combined only group. These findings suggest that child ADHD symptoms may not be as strongly linked to mental health problems in mothers as are clinically significant levels of child depressive symptoms.

Pfiffner and McBurnett (2006) examined parents of children aged 5 to 11 years with ADHD with and without comorbid anxiety diagnoses. Parents were assessed for various disorders using the SCID. When conducting regression analyses to study potential associations among child symptoms and parent symptoms, the researchers controlled for comorbid conduct disorder and ADHD subtype, as those significantly

related to child anxiety symptoms. The researchers then found that in mothers but not fathers, comorbid anxiety disorders in the children were associated with anxious symptoms in mothers. However, child anxiety disorders did not relate to maternal depression. Their results suggest that it is the anxiety symptoms in children with ADHD in particular that are linked to anxiety symptoms in mothers.

Although Vaughan, Feinn, Bernard, Brereton, and Kaufman (2013) did not specifically examine children with an ADHD (or ASD) diagnosis, they studied youth who demonstrated both internalizing and externalizing behavior problems. These researchers found that caregiving strain and parenting stress were related to both externalizing and internalizing symptoms in children.

In summary, it seems as if significant anxiety and depressive symptoms in children with ADHD are linked to negative parental mental health, with much of the research focusing on maternal mental health. Although the research suggests that subclinical levels of internalizing symptoms in children with ADHD may be linked to parental distress separate from ADHD symptoms themselves, more research is needed to clarify this potential relation. The current study further investigated that question by determining whether internalizing symptoms in children with ADHD related to overall parental distress levels above and beyond ADHD symptoms. In addition, this study examined whether disruptive behaviors also relate to parental distress levels, above and beyond ADHD symptoms.

Disruptive Behaviors and Internalizing Symptoms in Children with ADHD and ASD and Parental Distress

There is limited research examining the effect of comorbid ASD and ADHD symptoms on parent stress and psychopathology, which may be due to the fact that until the publication of the *DSM-5*, comorbid ASD and ADHD diagnoses were not permitted (American Psychiatric Association, 2000). Although both diagnoses have been used simultaneously in clinical practice, the exclusion of these dual diagnoses in the *DSM-IV-TR* likely led to less research on children with ASD and ADHD. However, there are some recent studies that examine these comorbid diagnoses. A recent study conducted by Van Steijn, Oerlemans, Van Aken, Buitelaar, and Rommelse (2014) examined mothers and fathers of children with ASD, ADHD, or ASD+ADHD. Parenting stress was assessed with the Parenting Stress Index, Short Form (PSI-SF), and when compared with normative data, mothers and fathers reported significantly higher levels of stress when parenting their child with ASD, ADHD, or ASD+ADHD but reported parenting stress in the normal range when parenting their children without disorders (one exception was that fathers reported more stress when parenting unaffected siblings of children with ADHD). Parents of children with ASD reported more depressive symptoms than parents of children with ADHD and ASD+ADHD, and parents of children with ASD+ADHD reported more depressive symptoms than parents of children with ADHD. These findings show that parenting stress and parental depression are linked to ASD and ADHD symptoms in children but do not suggest that the combined presence of both disorders adds a cumulative risk.

However, research conducted by Mansour, Dovi, Lane, Loveland, and Pearson (2017) suggests the possibility of a different conclusion. This study examined children with ASD, some of whom also had an ADHD diagnosis. They found that children with ASD who had a higher level of ADHD symptoms were more likely to meet criteria for comorbid psychiatric diagnoses (e.g., disruptive behavior disorders, mood disorders, anxiety disorders) than those with few or no ADHD symptoms. Because previously reviewed research suggests that high levels of disruptive behaviors and internalizing symptoms are associated with parent stress levels, it is possible that the combined presence of both disorders would be associated with greater difficulties for parents than either diagnosis alone. Similarly, Flouri, Midouhas, Charman, and Sarmadi (2015) found that children with ASD and ADHD displayed greater conduct problems than children with only an ASD diagnosis, and mothers reported higher levels of psychological distress. With respect to emotional problems, these researchers found that, among children from disadvantaged socioeconomic backgrounds, the ASD+ADHD group exhibited higher levels of emotional problems than did children with only an ASD diagnosis. No significant group differences with respect to emotional problems were noted for children who were not from disadvantaged backgrounds. Therefore, it is possible that when economic and community buffers are not present for support, comorbid ASD+ADHD diagnoses may lead to higher levels of childhood difficulties, and in turn, higher parental stress levels. However, neither of these studies included a comparison group of children with only an ADHD diagnosis, leaving the question of whether ASD+ADHD children display greater behavior problems than children with only ADHD unanswered.

Other research studies, however, closely examined children of all three diagnostic groups. Konst, Matson, and Turygin (2013) investigated children with ASD, ADHD, and ASD+ADHD. These researchers found that children with ASD+ADHD displayed more tantrum behaviors than children with either diagnosis alone. Jang et al. (2013) found that children with ASD+ADHD had more symptoms of worry and depression, conduct behavior problems, avoidant behavior, and tantrum behaviors than children with only ASD or ADHD. Due to higher levels of disruptive behaviors and internalizing symptoms in children with ASD+ADHD, it is possible that parents of children with comorbid diagnoses experience more difficulties and stress than parents of children with either diagnosis alone.

The results also suggest a need for further research to determine what factors specifically relate to negative parent outcomes, such as the presence of particular disruptive behaviors or internalizing symptoms in these children. The current study examined the association between these child characteristics and parental distress in children with ASD and ADHD diagnoses. In doing so, this study begins to address the gap in research examining parental factors with regard to children with both diagnoses.

Although the literature reviewed has shown a link between child problem behaviors and parental distress, the directionality of the associations cannot be definitively concluded. It is likely that child diagnostic symptoms, disruptive behaviors, and internalizing symptoms may lead to parental distress and symptoms of anxiety and depression, but it is equally likely that parental distress may lead to or exacerbate child diagnostic symptoms, disruptive behaviors, or internalizing symptoms. For example, Woodman, Mawdsley, and Hauser-Cram (2015) found that problem behaviors in children

and adolescents with developmental disabilities were associated with parenting stress, but the directionality of those associations varied based on the timeframe examined (i.e., early childhood, middle childhood, adolescence) and the type of problem behavior examined (i.e., externalizing or internalizing). Therefore, researchers should remain mindful that correlational research examining these areas cannot assume a particular directionality.

Parenting Practices

When examining parent stress levels and problem behaviors in children, it is important to also explore the role of parenting practices in those associations. Parenting practices can refer to a wide variety of parenting behaviors, but they generally include behaviors such as limit setting, punishment, positive reinforcement, and affective involvement. Parent psychopathology and stress levels likely impact parenting practices and vice versa. Likewise, child behavior problems likely impact parenting practices and vice versa. For example, Mackler et al. (2015) examined the associations among parenting stress, parenting practices (as defined by a composite score assessing three types of negative parental reactions to child distress: distressed reactions, punitive reactions, and minimizing reactions), and externalizing behaviors in a sample of children who were determined to be at risk for developing externalizing behavior problems when they were either infants or toddlers. The longitudinal design of the Mackler et al. study allowed the researchers to examine the directionality of associations. Although associations among the three variables had small effect sizes, overall, a transactional model including all three variables best fit the data, suggesting that parenting stress, parenting practices, and externalizing behaviors all impact each other.

Children with ASD and Parenting Practices

Rutgers et al. (2007) examined parenting practices and parenting stress in toddlers with and without ASD. Among other measures, the parents completed the Parental Efficacy Questionnaire to assess their feelings of parenting competence, ability to empathize with their child's feelings, and the ways they act under stress; the Child Rearing Practice Report to measure authoritative and authoritarian parenting styles; the Parenting Daily Hassles questionnaire to measure parenting stress; and the SCL-90 to assess parent psychopathology. When examining overall group differences, these researchers found that parents of control children versus parents of children with ASD exhibited more of an authoritative parenting style. However, no group differences were found with respect to parental efficacy, parenting daily hassles, or psychological problems among the parents.

Osborne, McHugh, Saunders, and Reed (2007) examined parenting practices, parenting stress, and child behavior problems in children with ASD. In this study, the parenting practice of "limit setting" (i.e., disciplining; Osborne et al., 2007, p. 4) was negatively associated with parenting stress and child behavior problems, and limit setting mediated the association between parenting stress and child behavior problems. Parent communication was negatively associated with parenting stress, but not with child behavior problems. These findings suggest that higher parent stress levels may decrease parents' ability to engage in certain positive parenting practices, which in turn, may negatively impact child behaviors in certain cases.

Although there is a lack of research specifically examining parent supervision practices in children with ASD, it is theorized that parents of children with ASD may

exhibit more monitoring behaviors than parents of children without ASD. For example, Anderson et al. (2012) found that children with ASD are at a higher risk for running off or eloping than their TD siblings. Therefore, it follows that parents of children with ASD are likely more vigilant and monitor their children more than parents of children with ADHD or no disorder, regardless of their children's disruptive behaviors.

Bader and Barry (2014) conducted a longitudinal study examining emotional parenting behaviors and disruptive behaviors in children with ASD aged 8 to 18 years. These researchers found that high levels of parental expressed emotion and criticism/hostility were related to high levels of disruptive behaviors in the children. Parental expressed emotion was found to relate to these externalizing behaviors even when accounting for more behavioral parenting practices, such as parental involvement, inconsistent discipline, and monitoring behaviors. Findings also indicated that parental criticism/hostility was related to increasing levels of disruptive behaviors over time, whereas the reverse was not found. Overall, these results suggest that certain parenting behaviors can influence their children's behaviors, but nuances examining the specific parenting practices in question must be taken into account. Research should continue to examine specific parenting practices to better understand how they are related to child behavior problems. In addition, it is also important to examine how parenting practices are related to specific behavior problems in children with ASD. The current study specifically investigated how parenting behaviors relate to disruptive behaviors as well as internalizing symptoms—the latter of which, in particular, is something that has not been looked at as extensively in the ASD literature.

Children with ADHD and Parenting Practices

The aforementioned review by Deault (2010) examined parenting practices in children with ADHD only and with comorbid oppositional and conduct problems. The author found that for children who displayed higher levels of oppositional and conduct problems, parents tended to display less positive parenting practices and more negative discipline styles. This finding suggests that, similar to parental distress, negative parenting practices are more closely related to disruptive behaviors than ADHD symptoms themselves.

Kashdan et al. (2004) conducted a comprehensive study examining how poor parental mental health (anxiety and depressive symptoms in particular) and child ADHD and externalizing symptoms related to parenting practices among children with an ADHD diagnosis. Parents completed the Disruptive Behavior Disorders Rating Scale (DBD) to assess for the presence of oppositional defiant behaviors and conduct behavior problems as well as ADHD symptomatology. Parent depressive symptoms were assessed with the BDI, and parent anxiety symptoms were assessed with the State-Trait Anxiety Inventory-Trait Version. To assess parenting practices, the variable composites of warmth and positive involvement and intrusiveness and negative discipline were developed. Overall, findings showed that parental anxiety was negatively associated with parental warmth/positive involvement and intrusiveness/negative discipline, but depression was not related to those parenting practices. Child ODD symptoms, as opposed to ADHD symptoms, independently related to parenting practices, suggesting that parenting practices are primarily associated with disruptive behaviors (oppositional behaviors in particular) rather than the ADHD symptoms.

When Harris et al. (2006) examined children with either ADHD or comorbid ADHD and dysthymic disorder, they found that regardless of diagnostic group, parents reported many problematic parenting practices. Parents completed the Family Assessment Device (FAD) measure which assessed levels of problem solving, communication, roles, affective responsiveness, affective involvement, behavior control, and general functioning. Five of the seven areas were in the clinically significant range, with no significant differences between groups. This finding suggests that parenting difficulties are found in parents of children with ADHD, regardless of whether clinically significant levels of depression are also present. Therefore, it is unlikely that it is the depressive symptoms that are related to parenting difficulties in children with co-occurring ADHD and depressive symptoms.

However, Pfiffner and McBurnett (2006) found that mothers of children diagnosed with ADHD and an anxiety disorder rather than only ADHD showed differences with respect to parenting practices. These mothers tended to exhibit higher levels of over-protectiveness and lower levels of positive parenting. Nevertheless, other parenting practices, such as parental warmth or levels of negativity, were not associated with clinically significant levels of child anxiety. Therefore, their findings suggest certain parenting practices, but not others, may be related to child anxiety levels. Further research needs to examine nuances in parenting practices to better determine how child behavioral characteristics relate to specific parenting practices in children with ADHD. In addition, more research is needed to examine how parenting practices relate to child behaviors in children with dual diagnoses of ASD and ADHD, which the current study has addressed.

Overview of the Current Study and Hypotheses

There are a variety of research studies examining disruptive behaviors and internalizing symptoms in children with ASD and ADHD and their association with parent factors; however, the current study expanded on the literature base and addressed some new questions. First, the current study sought to provide more evidence for the claim that children with ASD and ADHD exhibit higher levels of disruptive behaviors and internalizing symptoms than TD children. The current study also investigated whether children with comorbid ASD and ADHD diagnoses exhibited higher levels of disruptive behaviors and internalizing symptoms than children with only one of the diagnoses. Because dual diagnoses of ASD and ADHD have only recently been permitted to be diagnosed under APA guidelines, there is little existing research addressing this question.

Secondly, the current study examined differences in parental distress levels as well as differences in a variety of parenting practices based on child diagnostic status. The study investigated whether these parent factors differ based on child diagnostic group and whether a child's dual diagnosis of ASD and ADHD adds a cumulative risk to parents. This study added to the existing literature by examining acute, current levels of parental distress. In addition, this study examined a broader definition of parental distress (i.e. depressive, anxious, and stress symptoms). The current study also added to the literature by examining a variety of parenting practices rather than general positive or negative practices to better understand the nuances in parenting behaviors.

Finally, the current study explored the associations of child disruptive behaviors and internalizing symptoms with parental distress and parenting practices. Specifically,

the study examined whether these child behavior problems are related to parent factors above and beyond particular ASD and ADHD symptoms. Importantly, the current study investigated how internalizing symptoms are related to these parent factors—something that has not been extensively studied among these clinical populations. Understanding how this variety of child behavior difficulties are related to parent factors will likely help to inform therapies and treatments for children with these difficulties.

Note that hypotheses were tested as stated (without covariates) as well as controlling for demographics that significantly differed by group (for group analyses only) or that significantly related to the criterion variable in question (all analyses). In the analyses including covariates, adaptive functioning was included as an *a priori* planned covariate, given the likelihood that it would vary greatly across diagnostic groups and potentially relate to the criterion variables of interest.

Hypotheses

Based on a review of previous studies, the following hypotheses were made:

1. It was expected that parents of children with ASD+ADHD would report the highest level of disruptive behaviors for their children, followed by parents of children with ASD or ADHD, and then parents of TD children (Hypothesis 1).
2. It was expected that parents of children with ASD+ADHD would report the highest level of internalizing symptoms for their children, followed by parents of children with ASD or ADHD, and then parents of TD children (Hypothesis 2).
3. It was expected that parents of children with ASD+ADHD would report the highest level of parental distress, followed by parents of children with ASD or ADHD, and then parents of TD children (Hypothesis 3).

4. It was expected that parents of children with ASD+ADHD would report the lowest level of positive parenting (Hypothesis 4A), lowest level of parental involvement (Hypothesis 4B), and highest level of inconsistent parenting (Hypothesis 4C), followed by parents of children with ASD or ADHD, and then parents of TD children.
5. It was expected that parents of children with either ASD or ASD+ADHD would exhibit higher levels of monitoring/supervision than parents of children with ADHD only or parents of TD children (Hypothesis 5). Although there is a lack of research in this area, it was assumed that parents of children with ASD may be likely to exhibit more monitoring and supervision practices due to research establishing safety concerns regarding children with ASD.
6. The current study also examined the association between child behaviors and symptoms (examined on a continuum) and parent factors. Specifically, it was hypothesized that disruptive behaviors would be positively related to parental distress levels above and beyond ASD and ADHD symptoms (measured dimensionally) for all children (Hypothesis 6A). Secondly, it was hypothesized that internalizing symptoms would be positively related to parental distress levels above and beyond ASD and ADHD symptoms (measured dimensionally) for all children (Hypothesis 6B).
7. It also was hypothesized that disruptive behaviors would be negatively related to positive parenting practices (Hypothesis 7A), parental involvement (Hypothesis 7B), and parental monitoring/supervision (Hypothesis 7C) above and beyond ASD and ADHD symptoms (measured dimensionally). In addition, for parental

monitoring/supervision, it was hypothesized that disruptive behaviors would interact with ASD symptoms, in that the relation between disruptive behaviors and parental monitoring/supervision would be attenuated when ASD symptoms were higher (Hypothesis 7D). Furthermore, it was hypothesized that disruptive behaviors would be positively related to inconsistent discipline above and beyond ASD and ADHD symptoms (measured dimensionally; Hypothesis 7E).

8. Similarly, it was hypothesized that internalizing symptoms would be negatively related to positive parenting practices above and beyond ASD and ADHD symptoms (measured dimensionally; Hypothesis 8) based on previous research findings. Note that it was not expected that internalizing symptoms would be related to parental involvement, inconsistent discipline, or parental monitoring/supervision, as previous research has not shown a strong link between internalizing symptoms in children and these types of parenting practices.

CHAPTER II – METHOD

Participants

A total of 89 participants were recruited into the study (see the Procedure section for specific recruitment methods). A total of 8 participants never opened the research link that they were e-mailed by the researcher, and 12 participants self-excluded from the study after reading the eligibility criteria contained in the research link and before participating. A total of 9 participants completed a portion of the questionnaires but did not complete the entire study. Therefore, their data were excluded from the analyses. Two participants who completed all of the questionnaires reported that there was another child in the household with a psychological diagnosis, so their data were also excluded from the analyses (to be eligible to participate, only one child in each household was permitted to have a diagnosis to better control for other factors potentially impacting parental distress levels). Therefore, a total of 58 participants were included in the final analyses and are considered to be the sample for the current study. Participants were recruited primarily in the United States (with participants from 17 different states) as well as one participant each from the United Kingdom and Canada.

The full participant sample (N = 58) consisted of children and adolescents ages 7 to 17 years (M = 11.50, SD = 2.83). A total of 60.3% of the children in the sample were males (n = 35) and 39.7% were females (n = 23). A total of 81% of the children were characterized as white, 8.6% as black, 5.2% as Hispanic, 1.7% as Asian, and 3.4% as "Other" (i.e. Hawaiian and multi-racial).

Participants were recruited into four groups based on diagnoses. A total of 14 participants (i.e., ASD group) were reported to have a diagnosis of autism spectrum

disorder (ASD) but not attention-deficit/hyperactivity disorder (ADHD). A total of 16 participants (i.e., ADHD group) were reported to have a diagnosis of ADHD (8 with ADHD combined presentation, 2 with ADHD predominantly inattentive presentation, and 6 with ADHD predominantly hyperactive/impulsive presentation) but not ASD. A total of 13 participants (i.e., ASD+ADHD group) were reported to have a dual diagnosis of ASD and ADHD. Specifically, 7 participants were diagnosed with ASD and ADHD, combined presentation; 4 participants were diagnosed with ASD and ADHD, predominantly inattentive presentation; 1 participant was diagnosed with ASD and ADHD, predominantly hyperactive/impulsive presentation; and 1 participant was diagnosed with Asperger's disorder and ADHD, predominantly inattentive presentation. A total of 15 participants (i.e., TD group) were reported to have no psychological, developmental, or behavioral diagnoses. With respect to children in the clinical groups, 37.2% were reported to have received their ASD and/or ADHD diagnosis by a pediatrician, 27.9% by a psychologist, 13.9% by a neurologist, 9.3% by a psychiatrist, and 11.6% by another medical professional (developmental pediatrician, behavioral neurologist, or medical team).

In addition to diagnoses of ASD and/or ADHD, many children in the clinical groups were reported to have been diagnosed with additional psychological, behavioral, or developmental disorders. Of these children, 39.5% were also diagnosed with an anxiety disorder, 18.6% with a learning disability, 16.3% with depression, 13.9% with oppositional defiant disorder, 9.3% with an intellectual disability, 4.7% with conduct disorder, and 20.9% with an "other" diagnosis (i.e., obsessive-compulsive disorder, post-traumatic stress disorder, trauma, cerebral palsy, Tourette's, sensory processing disorder,

slow processing disorder, and pediatric autoimmune neuropsychiatric disorder associated with streptococcal infections; PANDAS).

The age of parent/guardian respondents ranged from 25 to 61 (M = 40.84, SD = 7.83). A total of 93.1% of the parent/guardian respondents who completed questionnaires about their child identified as female (n = 54), and 6.9% identified as male (n = 4). A total of 91.4% of respondents identified themselves as the mother of the child, 6.9% as the father, and 1.7% as the "female guardian." A total of 82.8% of the parents/guardians identified as white, 6.9% as black, 5,2% as Hispanic, 3.4% as "Other," and 1.7% as Asian. A summary of this demographic information as well as additional demographic information can be found in Table 1.

Table 1

Sample Characteristics: Child and Family Demographics

Full Sample Child Characteristics (Target Child)		*N* (%)	Mean (*SD*)
Age			11.50 (2.83)
	7	5 (3.9)	
	8	3 (2.3)	
	9	6 (4.7)	
	10	9 (7.0)	
	11	12 (9.4)	
	12	4 (3.1)	
	13	2 (1.6)	
	14	6 (4.7)	
	15	5 (3.9)	
	16	3 (2.3)	
	17	3 (2.3)	
Gender			
	Male	35 (60.3)	
	Female	23 (39.7)	
Race			
	White	47 (81.0)	
	Black	5 (8.6)	

Hispanic	3 (5.2)
Asian	1 (1.7)
Other	2 (3.4)
Current medication status	
Currently taking medication	30 (51.7)
Currently not taking medication	28 (48.3)

Clinical Group Child Characteristics	*N* (%)
Diagnosis	
Autism/autism spectrum disorder (ASD)	14 (32.6)
Attention-deficit/hyperactivity disorder (ADHD)	16 (37.2)
ASD+ADHD	13 (27.1)
Diagnosis determined by	
Psychologist	12 (27.9)
Psychiatrist	4 (9.3)
Pediatrician	16 (37.2)
Neurologist	6 (13.9)
Other	5 (11.6)
Other Psychological Diagnoses	
Anxiety disorder	17 (39.5)
ASD group	3 (21.4)
ADHD group	7 (43.8)
ASD+ADHD group	7 (53.8)
Depression	7 (16.3)
ASD group	1 (7.1)
ADHD group	2 (12.5)
ASD+ADHD group	4 (30.8)
Conduct disorder	2 (4.7)
ASD group	1 (7.1)
ADHD group	0 (0.0)
ASD+ADHD group	1 (7.7)
Learning disorder	8 (18.6)
ASD group	2 (14.3)
ADHD group	3 (18.8)
ASD+ADHD group	3 (23.1)
Intellectual disability	4 (9.3)
ASD group	1 (7.1)
ADHD group	1 (6.2)
ASD+ADHD group	2 (15.4)
Oppositional defiant disorder	6 (13.9)
ASD group	0 (0.0)
ADHD group	4 (25.0)
ASD+ADHD group	2 (15.4)

Other	9 (20.9)	
ASD group	2 (14.3)	
ADHD group	3 (18.8)	
ASD+ADHD group	4 (30.8)	

Parent/Guardian Respondent Characteristics	*N* (%)	Mean (*SD*)
Age		40.84 (7.83)
Gender		
Male	4 (6.9)	
Female	54 (93.1)	
Race		
White	48 (82.8)	
Black	4 (6.9)	
Hispanic	3 (5.2)	
Asian	1 (1.7)	
Other	2 (3.4)	
Marital Status		
Married	43 (74.1)	
Separated	2 (3.4)	
Divorced	7 (12.1)	
Widowed	1 (1.7)	
Never married/living with someone	4 (6.9)	
Never married/living alone	1 (1.7)	
Education level		
High school graduate	5 (8.6)	
Some college/specialized training	10 (17.2)	
College/university graduate	26 (44.8)	
Graduate professional degree	17 (29.3)	
Family Income		
$0-$4,999	1 (1.7)	
$5,000-$9,999	1 (1.7)	
$10,000-$14,999	1 (1.7)	
$15,000-$24,999	2 (3.4)	
$25,000-$34,999	3 (5.2)	
$35,000-49,999	7 (12.1)	
$50,000-$74,999	8 (13.8)	
$75,000-$99,999	12 (20.7)	
> $100,000	23 (39.7)	

Measures

For the following measures, internal consistency for the current sample was calculated for all scales of interest and appear in Table 2.

Demographic and Diagnostic Form. Parents completed a form recording information about their child's diagnosis, medical history, age, race, family background, socioeconomic status, and other demographic variables. The form included confirmation of a diagnosis of ASD and/or ADHD by asking parents about diagnostic classification, age of diagnosis, and professional and affiliated facility that made the diagnosis (i.e., to rule-out parents merely self-reporting that they think their child has the diagnosis). The form also assessed medication history, current medication type/dosage, and history and details of diagnoses of other psychological/behavioral disorders for the child (if applicable). Information about diagnoses of siblings in the home were also gathered to ensure that only the target child had a psychological diagnosis or diagnoses.

The Children's Social Behavior Questionnaire (CSBQ; Hartman et al., 2006; Luteijn et al., 2000). The CSBQ is an 82-item parent-report questionnaire that was used to assess both ASD symptoms and disruptive behaviors. This measure consisted of items from the five subscales of the CSBQ published by Luteijn et al. (2000) as well as 16 additional items from a revised version published by Hartman et al. (2006). When completing the questionnaire, parents responded to various statements such as, "Has little or no need for contact with others" or "Is fascinated by certain colors, forms, or moving objects" by checking *0-it does not describe the child, 1-infrequently describes the child,* or *2-clearly applies to the child*.

Specific items from the CSBQ were used in three ways. The CSBQ published in 2000 assessed a fairly broad range of expressed behaviors beyond those necessarily consistent with the diagnostic criteria of ASD. One subset of expressed behaviors captured by this version includes the Acting Out scale, with items such as "behaves aggressively" and "quickly gets angry." Scores on this subscale were used in the creation of a Disruptive Behaviors composite variable for the current study. The CSBQ published in 2006 was revised to be more specific to an ASD diagnosis, so the items in this version assessed a much narrower range of behaviors. The CSBQ Total score from this version was used as a criterion check for an ASD diagnosis. In addition, this CSBQ Total score was used as the measure of ASD symptomatology for analyses examining ASD symptoms dimensionally.

Scores on this measure show evidence of reliability. Test-retest reliability for the Acting Out subscale is satisfactorily high (ICC .85), and internal consistency is very high (Cronbach's alpha of .92). This subscale also exhibits evidence of validity in that it correlates with subscales of other measures investigating similar constructs. For example, scores on the Acting Out subscale correlate with the Aggressive Behaviors scale of the Child Behavior Checklist (CBCL; .85).

The 49 items on the CSBQ (Hartman et al., 2006) that make up the CSBQ Total score used as a criterion check for an ASD diagnosis and as the dimensional ASD symptom score also exhibit evidence of reliability. During scale development (Hartman et al., 2006), internal consistency of this scale was very good (Cronbach's α of .94), as were both interrater reliability (ICC = .86), and test-retest reliability (r = .90). In addition, this scale demonstrated evidence of validity. Individuals with high-functioning

autism, PDD-NOS, ADHD, ADHD + PDD-NOS, ID, MR + PDD, MR, and controls were all given these items. Mean scores on the scale were significantly different for each group, with individuals with high-functioning autism having the highest mean score (47.22), and individuals with various forms of PDD having the next highest scores. Those findings support the claim that the CSBQ items tap into ASD symptomatology more specifically than other diagnostic symptoms.

National Institute for Children's Health Quality Vanderbilt Assessment Scales (Vanderbilt; Wolraich et al., 2003). The Vanderbilt is a 55-item parent-report questionnaire updated with minor wording changes from the Vanderbilt Rating Scales developed by Mark Wolraich (Wolraich et al., 1998). This measure consists of 47 items that require parents to respond to various statements indicating whether, over the past 6 months, their child has *0-never, 1-occasionally, 2-often,* or *3-very often* exhibited certain behaviors such as "is forgetful in daily activities," "is physically cruel to people," or "is sad, unhappy, or depressed." On eight additional items, parents indicate their child's overall performance (*1-excellent, 2-above average, 3-average, 4-somewhat of a problem, 5-problematic)* in a variety of settings to assess level of impairment.

The ADHD Combined Inattention/Hyperactivity Screen scale was used as a criterion check for an ADHD diagnosis. This was done by following the symptom count scoring protocol for the scale. The scale's total score (sum of ratings) was used as the measure of ADHD symptomatology for analyses examining ADHD symptoms dimensionally. Scores on both the Oppositional-Defiant Disorder Screen scale and Conduct Disorder Screen scale were used in the creation of a Disruptive Behaviors composite. Scores on the Anxiety/Depression Screen scale were be used in the creation

of the Internalizing Symptom composite. Composite creation is described in the Results section.

Wolraich et al., 1998 reported that the Vanderbilt measure exhibits high internal consistency for the inattention (Cronbach's α of .92), hyperactivity-impulsivity (Cronbach's α of .90), ODD-CD (Cronbach's α of .91), and Anxiety/Depression (Cronbach's α of .79) subscales. The Computerized Diagnostic Interview Schedule for Children (C-DISC; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stonem, 2000), which is used to diagnose various disorders in children, was highly correlated (r = .79) with the Vanderbilt, providing evidence of validity.

The Adaptive Behavior Assessment System, Third Edition (ABAS-3; Harrison & Oakland, 2015). The ABAS-3 Parent Form (Ages 5-21) is a comprehensive measure of adaptive functioning that assesses a wide variety of abilities (i.e. broadly, Conceptual, Social, and Practical skills). Parents are asked to rate the degree to which each statement applies to their child, indicating whether a skill is something that their child is *0-is not able to do, 1-never does independently, 2-sometimes does independently,* or *3-always does independently.* Statements include items such as, "works independently and asks for help only when necessary," and "has one or more friends." This measure provides an overall General Adaptive Composite score, which is a norm-referenced standard score that estimates the child's overall adaptive functioning when compared to same-aged peers. GAC scores on the ABAS can range from 40 to 120 and has a mean of 100 and standard deviation of 15. The GAC was used as the measure of adaptive functioning in the current study.

The GAC scale demonstrates evidence of reliability; Cronbach's alpha for the scale was .99. In the standardization process of this measure, the validity of the questionnaire was tested. The ABAS-3 GAC was highly correlated with the composite score on another well-established measure of adaptive functioning (Vineland Adaptive Behavior Scales, Second Edition), with a correlation coefficient of .80.

The Strengths and Difficulties Questionnaire (SDQ; Goodman 1997). The SDQ includes a 25-item assessment portion evaluating a wide range of child behaviors, both positive and negative. Parents rate the degree to which each statement applies to their child, either *0-not true, 1-somewhat true, or 2-certainly true.* Statements include items such as "considerate of other people's feelings" and "often loses temper." After the 25-item section, parents are asked to complete 8 additional items indicating the extent to which their child's difficulties impact their everyday life. This measure provides a Conduct Problems scale, which was used in the creation of the Disruptive Behaviors composite for the current study. The SDQ also provides an Emotional Problems scale, which was used in the creation of the Internalizing Symptoms composite for the current study. Composite creation is described in the Results section.

Scores obtained from this measure demonstrate evidence of reliability. In scale development, Cronbach's alphas for the subscales of interest were .67 for Emotional Symptoms and .63 for Conduct Problems. In a study assessing the validity of this measure (Goodman & Scott, 1999), scores obtained from the SDQ were highly correlated with scores from the Child Behavior Checklist (CBCL; r = .87 for total scores, r = .84 for externalizing/conduct problems, and r = .74 for internalizing/emotional problems).

When compared to information obtained from a semi-structured interview, the SDQ was as effective as the CBCL in detecting externalizing and internalizing problems.

The Depression, Anxiety, and Stress Scales--21 (DASS; Lovibond & Lovibond, 1995). This measure was used to assess mental health difficulties in parents; in particular, it assessed depressive, anxious, and stress symptoms. This shortened measure consists of 21 items that require participants to rate how much various statements have applied to them over the preceding week by checking *0-Did not apply to me at all, 1-Applied to me to some degree, or some of the time, 2-Applied to me a considerable degree, or a good part of time,* or *3-Applied to me very much, or most of the time.* Items include statements such as, "I felt that life was meaningless," "I felt I was close to panic," and "I found it hard to wind down." This measure results in three scale scores with 7 items each: Depression, Anxiety, and Stress. When administered to a non-clinical normative sample, consistency scores for the scales were very high: Cronbach's alpha included .88 for the Depression scale, .82 for the Anxiety scale, .90 for the Stress scale, and .82 for the overall Total score composite. When the validity of this measure was investigated, it exhibited good convergent validity with the Hospital Anxiety and Depression Scale and the Personal Disturbance scale, similar to the full version of the DASS (Henry & Crawford 2005). For the current study, parental distress was conceptualized as a composite of the Depression, Anxiety, and Stress subscale ratings. More specifically, each subscale total was multiplied by two (as per protocol for the DASS-21 shortened measure), and then the sum of the three subscales was used as the total score of Parental Distress. Use of a Total score helped to create a more stable and reliable measure of parental distress.

Alabama Parenting Questionnaire (APQ; Frick, 1991). The Alabama Parenting Questionnaire was used as the measure of parenting practices. This measure consists of 42 items that requires parents to rate the degree to which each item describes their parenting practices on a 5-point scale from 1 to 5: (1) *Never*, (2) *Almost Never*, (3) *Sometimes*, (4) *Often*, and (5) *Always* (Shelton, Frick & Wootton, 1996). Items include statements such as "You have a friendly talk with your child" and "You feel that getting your child to obey you is more trouble than it's worth." Items load onto five scales: Parental Involvement, Positive Parenting, Poor Monitoring/Supervision, Inconsistent Discipline, and Corporal Punishment. To facilitate the interpretations of the current study's findings, the Poor Monitoring/Supervision subscale was reverse scored and renamed Parental Monitoring/Supervision. Therefore, higher scores on this scale indicated higher levels of monitoring and supervision. With the exception of the Corporal Punishment scale [which was not included in the study due to its very low reliability according to Shelton, Frick, and Wootton (1996)], all scales have demonstrated acceptable internal consistency. Reported Cronbach's alphas for the scales are as follows: Parental Involvement ($\alpha = .80$), Positive Parenting ($\alpha = .80$), Poor Monitoring/Supervision ($\alpha = .67$), and Inconsistent Discipline ($\alpha = .67$; Shelton et al., 1996).

Procedure

Following IRB approval from The University of Southern Mississippi, participants were recruited from community groups, schools, churches, outpatient clinics, summer camps, online support groups, and word of mouth, including referral sampling. Interested participants were e-mailed a link to access the research study via a secure,

online website. After clicking the link, participants were first presented with information outlining study eligibility criteria. Next, participants were presented with the study consent form, and if they decided to participate, they clicked the "next" button to consent to participation and begin the study. They completed a demographic and diagnostic form, the CSBQ, the SDQ, the Vanderbilt, the ABAS-3, the APQ, and the DASS, in that order. Participants were allowed to skip any items they did not wish to complete. At the end of the study, they were given the opportunity to elect to receive a $5 Starbucks electronic gift card in appreciation for completing the study. A total of 50 participants (83% of the 60 participants who completed all measures in the study, which included the two participants excluded from the analyses) elected to receive the incentive. All participants were provided with the researcher's e-mail address so they could contact her at any point before, during, or after the study with any questions or concerns.

CHAPTER III - RESULTS

Data Management

Before beginning any analyses, the dataset was examined for missing data, and the following values were found to be missing: three data points for the CSBQ, three data points for the Vanderbilt, and two data points for the SDQ. To impute these missing data, the participant's mean for each subscale with missing data was calculated, and then the mean value was substituted for the missing data point. In addition to data missing from those scales, some data points were also missing from the ABAS-3 scale. Following the protocol outlined in the ABAS-3 manual, if the number of skipped items did not exceed two items for a subscale, those items were scored as zero, and the subscale was calculated as is. This procedure needed to be implemented 21 times across all items of the ABAS and all participants. Only two subscales had more than two missing items, so for those two value points, the participant's mode for that subscale was substituted for the missing item (the mode rather than the mean was used because this measure required whole-number item scores to be converted to a standardized score). In addition, one participant did not record a birth date for his or her child (birth date is required to calculate the participant's age in years and months to compute ABAS-3 scaled scores). For this participant, the middle age range was used based on that participant's recorded age. Three other participants reported a birthdate for their child that was discrepant from the age they reported for their child, but as the birthdate and age discrepancies were minor (only a difference of 1-25 days), the provided birthdate was used to calculate their age for the ABAS-3 measure standardization procedure.

After missing data were addressed, all variables of interest were examined for outliers. Outliers (i.e. variables greater than three standard deviations above or below the mean of the scale; Ghosh & Vogt, 2012) were found with respect to the DASS Depression scale, DASS Anxiety scale, DASS Stress scale, APQ Parental Involvement scale, APQ Parental Monitoring/Supervision scale, and Vanderbilt Conduct Disorder scale. Specifically, only one outlier was found for each scale, with the exception of the Vanderbilt CD scale, which had two outliers. To normalize the data, a winsorizing process was used (Dixon, 1960). Therefore, for each value that was three standard deviations above or below the mean, that value was changed to be 0.1 units greater than or less than the next highest or lowest value for that variable, depending on the nature of the outlier. For the one variable that had two outliers, one value was 0.1 units greater and the other value was 0.2 units greater, in rank order. After this process was used, skew and kurtosis values for all variables were calculated. Skew and kurtosis were found to be within acceptable limits, with the exception of the DASS Anxiety scale, which was still slightly peaked (kurtosis value of 2.48). However, as this variable was not used in subsequent analyses (Total DASS score was used instead, as will be described later), no further data transformations were conducted. In addition, all scales demonstrated appropriate internal consistency reliability levels based on Cronbach's alphas. More detailed information regarding scale and composite means, standard deviations, reliability, skewness, and kurtosis, can be found in Table 2.

Table 2

Descriptive Statistics for Variables of Interest (Scales and Composites)

	M	*SD*	Potential Range	Actual Range	Cronbach's alpha	Skew	Kurtosis
ASD Symptoms	32.61	22.60	0-98	0-83	.97	.28	-.56
ADHD Symptoms	22.10	13.99	0-54	0-54	.96	.44	-.61
Adaptive Functioning	87.61	19.73	40-120	48-120	.99	-.23	-.85
Disruptive Behaviors	.00	.87	--	-1.0-3.0	--	1.22	1.40
CSBQ Acting Out Scale	11.12	7.66	0-28	0-27	.93	.14	-1.10
Vanderbilt ODD Scale	7.37	6.47	0-24	0-24	.94	1.05	.14
Vanderbilt CD Scale	1.55	2.54	0-42	0-8.2	.89	1.69	1.53
SDQ Conduct Scale	2.43	2.54	0-10	0-10	.83	1.24	1.30
Internalizing Symptoms	.00	.93	--	-1.2-2.4	--	.74	.09
Vand. Anx./Dep. Scale	5.66	5.18	0-21	0-19	.92	1.00	.54
SDQ Emot. Prob. Scale	3.45	2.73	0-10	0-10	.77	.36	-.78
Parental Distress	23.66	24.91	0-126	0-100	.97	1.57	1.95
DASS Depression Scale	7.21	9.16	0-42	0-34.1	.93	1.56	1.63
DASS Anxiety Scale	5.17	8.47	0-42	0-30.1	.93	1.83	2.47
DASS Stress Scale	11.28	8.74	0-42	0-36.1	.89	.93	.65
Parental Involvement	41.88	5.28	10-50	28.9-50	.79	-.71	.13
Positive Parenting	26.95	2.79	6-30	19-30	.72	-1.03	.69
Parental Mon./Sup.	45.37	4.63	10-50	32.8-50	.73	-1.18	.89
Inconsistent Discipline	13.38	4.06	6-30	6-22	.74	.15	-.65

Note: Scales used for composites are italicized. Disruptive Behaviors and Internalizing Symptoms composites are z-scores. *M* = mean; *SD* = standard deviation; ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder; CSBQ = Children's Social Behavior Questionnaire; ODD = oppositional defiant disorder; CD = conduct disorder; SDQ = Strengths and Difficulties Questionnaire; Vand. = Vanderbilt; Anx = Anxiety; Dep. = Depression; Emot. Prob. = Emotional Problems; DASS = Depression, Anxiety, and Stress; Mon./Sup. = Monitoring/Supervision..

41

Preliminary Analyses

Criterion Checks

Criterion checks were conducted to ensure that group assignments (ASD, ADHD, ASD+ADHD, and TD) were supported by data. All participants who were classified as having a diagnosis of ASD and/or ADHD were reported to have been given that diagnosis by a medical professional (Table 1). Group means for the ASD group and the ASD+ADHD group on the CSBQ (Table 3) were found to be similar to or higher than the sample means found by Hartman et al. (2006) with respect to participants with high-functioning autism (M = 47.22, SD = 15.37) and pervasive developmental disorder-not otherwise specified (PDD-NOS; M = 37.84, SD = 15.94). More importantly, a one-way analysis of variance (ANOVA) examining group differences found that with respect to the current sample, both the ASD group and the ASD+ADHD group had a significantly higher CSBQ score than the ADHD group (p = .049 and p = .001, respectively) and the TD group (p = < .001 and p = < .001, respectively). This finding demonstrates that the ASD and ASD+ADHD groups had significantly more ASD symptoms than the ADHD or TD group, and it provides further support for accurate group assignment in the current study.

When ADHD symptoms were analyzed at the group level, the ADHD and ASD+ADHD groups were found to have significantly higher scores on the Vanderbilt Hyperactivity and Inattention Symptom Count Combined scale than the ASD group (p = .001 and p = .01, respectively) or the TD group (p < .001 and p = < .001, respectively). This finding demonstrates that the current ADHD and ASD+ADHD groups had significantly more ADHD symptoms than the ASD or TD groups, and it provides further support for

accurate group assignment in the current study. Refer to Table 3 for more details on group differences on the criterion check variables.

Table 3

Group Differences on Criterion and Demographic Variables)

	ASD (n = 14)	ADHD (n = 16)	ASD+ADHD (n = 13)	TD (n = 15)	F (3, 54)
Criterion Variables					
ASD Symptoms	43.62 [c] (13.87)	33.09 [b] (15.91)	52.08 [c] (18.75)	4.93 [a] (5.89)	29.64***
ADHD Tot. Sympt. Count	5.07 [b] (4.86)	10.69 [c] (5.59)	10.08 [c] (5.20)	.40 [a] (.83)	16.75***
Potential Covariates					
Child Age	11.86 [ab] (2.54)	10.38 [a] (2.22)	13.31 [b] (2.78)	10.80 [a] (3.08)	3.38*
Child Gender	.36 [a] (.50)	.38 [a] (.50)	.23 [a] (.44)	.60 [a] (.51)	1.41
Child Race	.79 [ab] (.43)	.75 [ab] (.45)	.69 [a] (.48)	1.00 [b] (.00)	1.74
Parent Age	39.71 [ab] (8.73)	37.19 [a] (7.17)	44.54 [b] (6.40)	42.60 [ab] (7.48)	2.70†
Parent Gender	.86 [a] (.36)	1.00 [a] (.00)	1.00 [a] (.00)	.87 [a] (.35)	1.44
Parent Race	.71 [a]	.81 [ab]	.77 [ab]	1.00 [b]	1.60

	(.47)	(.40)	(.44)	(.00)	
Family Income	7.21 [a] (1.85)	6.94 [a] (2.59)	7.46 [a] (1.61)	8.07 [a] (1.22)	.97
Child Adapt. Functioning	75.86 [a] (15.25)	92.50 [b] (16.03)	71.85 [a] (16.15)	107.00 [c] (8.46)	18.29***

Note: tandard deviations are in parentheses; means that do not share superscripts differ by $p < .05$ according to a Least Significance Difference (LSD) test; *SD* = standard deviation. ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder; TD = typically-developing; Tot. Sympt. Count = Total Symptom Count; age is in years; gender was coded 0 = male and 1 = female; race was coded 0 = non-white and 1 = white; family income was coded on a 9-point ordinal scale, with 1 = $0-4,999 and 9 = $100,000 and above; child adaptive functioning is a standardized score (population mean of 100 and standard deviation of 15) on the Adaptive Behavior Assessment System, third edition.

[†]trend, $p < .10$. * $p < .05$. *** $p < .001$.

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Composite Calculations

When conceptualizing parental distress for this study, the total score on the DASS was used rather than individual DASS subscale scores. This approach was followed to create a broader, more stable measure of parental distress. Due to high correlations between the three scales, this decision was empirically supported. Specifically, Anxiety and Stress were highly correlated, $r = .77$, $p < .001$, as was Anxiety and Depression, $r = .90$, $p < .001$, and Stress and Depression, $r = .85$, $p < .001$.

When conceptualizing child disruptive behaviors and child internalizing symptoms, a Disruptive Behaviors composite and Internalizing Symptoms composite were created, respectively. To create the Disruptive Behaviors composite variable, raw scores from the CSBQ Acting Out subscale, Vanderbilt ODD Screen scale, Vanderbilt CD Screen scale, and SDQ Conduct Problems scale were converted to standardized *z*-scores. The mean of the *z*-scores was then calculated and used as the Disruptive Behaviors composite variable. To ensure that this *z*-score was a cohesive measure of disruptive behavior, correlation analyses were conducted with respect to the subscale scores used to create the composite. All four were significantly correlated with one another (*r*s ranging from .56 to .76; all statistically significant).

To create the Internalizing Symptoms composite, raw scores from the Vanderbilt Anxiety/Depression Screen scale and the SDQ Emotional Problems scale were converted to standardized *z*-scores. The mean of the *z*-scores was then calculated and used as the Internalizing Symptom composite. To ensure that this *z*-score was a cohesive measure of internalizing symptoms, correlation analyses were conducted, and both scales used to calculate the composite were found to be significantly correlated, $r = .73$, $p < .001$.

Preliminary ANOVAs and Correlations

To determine whether demographic variables (child gender, race, and age; parent gender, race, and age; and family income) needed to be used as control variables in subsequent analyses, ANOVAs were used to determine if any group differences emerged on these variables, and zero-order correlation analyses were conducted to determine how these variables related to the criterion variables of interest. Child adaptive functioning was an *a priori* planned covariate, but it was also included in the ANOVAs and correlation analyses to inform how it differed across groups and related to criterion variables. Race was dichotomized (white and nonwhite) for the analyses.

With respect to group differences, only child age and child adaptive functioning significantly differed depending on group (Table 3). Specifically, the ASD+ADHD group was slightly older than the ADHD and TD groups. The ASD and ASD+ADHD groups were characterized by lower adaptive scores than the ADHD or TD groups. In addition, the ADHD group had a lower adaptive score than the TD group. Parent age was marginally associated with group, but this finding was likely redundant with the group difference for child age (parent age and child age were significantly correlated, $r = .72$, $p < .001$. Thus, it was determined that child adaptive functioning and child age would be used as covariates in all ANOVAs testing for group differences.

With respect to child composite criterion variables, zero-order correlations indicated that child gender and adaptive functioning were significantly correlated with disruptive behaviors, with more males and children with lower adaptive functioning exhibiting more disruptive behaviors (Table 4). In addition, parent age and family income were marginally related, with children of younger parents and children coming

from families with lower incomes tending to exhibit more disruptive behaviors. Parent race, child race, and child adaptive functioning were significantly correlated with internalizing symptoms (Table 4). More internalizing symptoms were found in children who were non-white (and had non-white parents) and in children who had lower adaptive functioning.

With respect to parent factor criterion variables, family income and child adaptive functioning were significantly correlated with parental distress, with lower-income parents and parents of children with lower adaptive skills reporting higher levels of distress (Table 4). Child gender and parent age were marginally associated with parental distress, with younger parents and parents of males tending to report higher levels of distress. Mothers reported significantly higher levels of positive parenting, parental involvement, and parental monitoring/supervision. Parents of children with higher adaptive functioning also reported higher levels of parental involvement. Finally, parental race was significantly associated with inconsistent parenting, with white parents reporting higher levels of inconsistent discipline than non-white parents (Table 4).

Table 4

Zero-Order Correlations among Potential Control Variables and Criterion Variables)

	Disrupt. Beh.	Intern. Sympt.	Parental Distress	Positive Parenting	Parental Involv.	Parental Mon./Sup.	Incons. Disc.
Child Age	-.06	.07	-.06	.06	.14	-.20	.07
Child Gender	-.31*	-.07	-.23†	-.19	-.02	.01	-.13
Child Race	-.11	-.33*	-.14	-.06	.13	.09	.02
Parent Age	-.25†	-.09	-.24†	.13	.16	-.01	-.03
Parent Gender	.13	.14	.09	.44**	.32*	.26*	-.04
Parent Race	.05	-.32*	-.11	.09	.06	-.02	.29*
Family Income	-.23†	-.04	-.36**	-.05	.20	-.07	.02
Child Adapt. Func.	-.49***	-.40**	-.43**	.10	.36**	.01	-.10

Note: Disrupt. Beh. = Disruptive Behaviors; Intern. Sympt. = Internalizing Symptoms; Involv. = Involvement; Mon./Sup. = Monitoring/Supervision; Incons. Disc. = Inconsistent Discipline; Adapt. Func. = Adaptive Functioning; gender was coded 0 = male and 1 = female; race was coded 0 = non-white and 1 = white; family income was coded on a 9-point ordinal scale, with 1 = $0-4,999 and 9 = $100,000 and above.

†trend, $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

When conducting the ANOVA analyses for hypothesis testing, analyses were run both with and without covariates to aid in interpretation. When covariates were included, adaptive functioning and child age were included as covariates in all analyses, as they were found to significantly differ by group. Other covariates were added as needed, based on correlations with particular criterion variables. If demographic variables were highly related to each other (i.e., child race and parent race or child age and parent age), only one of the variables was included as a covariate to avoid redundancy. Covariates included in each analysis are specified when presenting the results for the respective analysis.

When conducting the regression analyses for hypothesis testing, analyses were run both with and without covariates to aid in interpretation, adaptive functioning was included as a covariate (decided *a priori*) in all analyses (as explained in the Current Study section). In addition, other covariates were added as needed, based on correlations with particular criterion variables. Similarly, if demographic variables were highly related to each other (i.e., child race and parent race or child age and parent age), only one of the variables was included as a covariate to avoid redundancy. Covariates included in each analysis are specified when presenting the results for the respective analysis. Finally, before running analyses to test the hypotheses, the interrelations among the variables of interest for the current study were examined in a zero-order correlation matrix (Table 5). Within the child characteristics, ASD symptoms and ADHD symptoms were positively correlated with one another, and both of these symptoms domains were positively correlated with child disruptive behaviors and internalizing symptoms.

Furthermore, disruptive behaviors and internalizing symptoms were positively correlated. When examining relations with parent factors, all child variables (i.e., ASD symptoms, ADHD symptoms, disruptive behaviors, and internalizing symptoms) were positively correlated with parental distress. Both ADHD symptoms and disruptive behaviors were positively correlated with inconsistent discipline, whereas disruptive behaviors were negatively correlated with parental monitoring/supervision. Within the parent factors, parental distress was negatively correlated with parental monitoring/supervision and positively correlated with inconsistent parenting. Finally, positive parenting was positively correlated with parental involvement, whereas parental monitoring/supervision was negatively correlated with inconsistent discipline. Further information regarding these findings can be found in Table 5.

Table 5

Zero-Order Correlations among Variables of Interest

	2.	3.	4.	5.	6.	7.	8.	9.
1. ASD Symptoms	.66***	.76***	.54***	.58***	-.10	-.12	-.25†	.21
2. ADHD Symptoms	--	.77***	.51***	.53***	.13	-.03	-.05	.28*
3. Disruptive Behaviors		--	.50***	.62***	-.05	-.05	-.28*	.47***
4. Internalizing Symptoms			--	.30*	-.09	-.08	.01	.17
5. Parental Distress				--	-.003	-.07	-.27*	.35**
6. Positive Parenting					--	.68***	.21	.02
7. Parental Involvement						--	.10	-.04
8. Parental Mon./Sup.							--	-.29*
9. Inconsistent Disc.								--

Note: ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder; Mon. = Monitoring; Sup. = Supervision; Disc. = Discipline.

†trend, p <.10. * p < .05. ** p < .01. *** p < .001..

Hypothesis Testing: ANOVAs for Hypotheses 1 to 5

To test Hypotheses 1 through 5, a one-way ANOVA with diagnostic group (with 4 levels) as the independent variable was conducted. Fisher's Least Significant Difference *post hoc* tests were conducted to examine the nature of the group differences. LSD tests were selected due to the fairly small number of groups being assessed and to allow for a more liberal detection of group differences, as this was an exploratory study.

Hypothesis 1

Hypothesis 1 (that parents of children with ASD+ADHD would report the highest level of disruptive behaviors for their children, followed by parents of children with ASD or ADHD, and then parents of TD children) was partially supported. The analysis examining disruptive behaviors was significant (Table 6), and follow-up analyses demonstrated that children in the ASD+ADHD group and children in the ADHD group exhibited significantly more disruptive behaviors than children in the ASD group (p = .003 and p = .008, respectively) or TD group ($p < .001$ and $p < .001$, respectively). However, contrary to what was predicted, children with ASD+ADHD did not exhibit significantly more disruptive behaviors than children within the ADHD group. In addition, as predicted, children with ASD exhibited more disruptive behaviors than TD children (p = .04).

Table 6

Results of One-Way Analyses of Variance (ANOVAs) Examining Group Differences on Criterion Variables (Hypotheses 1-5))

	ASD (n = 14)	ADHD (n = 16)	ASD+ADHD (n = 13)	TD (n = 15)	F (3, 54)	Eta Squared
Disruptive Behaviors	-.23 [b] (.59)	.45 [c] (.75)	.58 [c] (.97)	-.78 [a] (.24)	12.48***	.41
Intern. Symptoms	-.08 [b] (.73)	.51 [c] (.67)	.43 [bc] (1.18)	-.85 [a] (.30)	9.93***	.36
Parental Distress	22.43 [ab] (19.71)	26.75 [bc] (26.71)	40.33 [c] (30.28)	7.07 [a] (7.05)	5.19**	.22
Positive Parenting	26.50 [a] (3.13)	27.94 [a] (2.02)	26.54 [a] (3.55)	26.67 [a] (2.41)	.93	.05
Parental Involvement	41.21 [a] (7.46)	43.75 [a] (3.32)	40.08 [a] (5.02)	42.07 [a] (4.56)	1.28 1.28	.07 .07
Parental Mon./Sup.	44.76 [a] (5.98)	46.06 [a] (4.06)	45.23 [a] (5.17)	45.33 [a] (3.54)	.20	.01
Inconsistent Discipl.	11.07 [a] (3.89)	15.06 [b] (4.64)	14.38 [b] (3.36)	12.87 [ab] (3.25)	3.07*	.15

Note: Standard deviations are in parentheses; Disruptive Behaviors and Internalizing Symptoms composites are z-scores; means that do not share superscripts differ by $p < .05$ according to a Least Significance Difference (LSD) test; ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder; TD = typically-developing; Intern. Symptoms = Internalizing Symptoms; Mon./Sup. = Monitoring/Supervision; Discipl. = Discipline.

* $p < .05$. ** $p < .01$. *** $p < .001$.

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When covariates (child adaptive functioning, child age, child gender, and family income) were entered into an analyses of covariance (ANCOVA) examining the effect of group on disruptive behaviors, the overall model was significant (Table 7), as was the effects of group, $F(3,50) = 8.22$, $p < .001$, partial $\eta^2 = .33$, and the covariate, adaptive functioning, $F(1,50) = 5.72$, $p = .02$, partial $\eta^2 = .10$. Follow-up analyses indicated that the ASD+ADHD and ADHD groups continued to exhibit more disruptive behaviors than children in the ASD group ($p = .004$ and $p = .002$, respectively) or TD group ($p = .02$ and $p = .001$, respectively). However, children in the ASD and TD groups did not significantly differ from each other with respect to disruptive behaviors when accounting for adaptive functioning, age, gender, and family income.

Table 7

Results of One-Way Analyses of Covariance (ANCOVAs) Examining Group Differences on Criterion Variables (Hypotheses 1-5)

	ASD (n = 14)	ADHD (n = 16)	ASD+ADHD (n = 13)	TD (n = 15)	*df*	*F*	Partial Eta Squared
Disruptive Behaviors	-.41 [a] (.19)	.48 [b] (.17)	.36 [b] (.22)	-.45 [a] (.21)	(7, 50)	7.83***	.52
Intern. Symptoms	-.23 [a] (.22)	.57 [b] (.20)	.17 [ab] (.26)	-.54 [a] (.25)	(6, 51)	6.03***	.42
Parental Distress	19.27 [a] (6.28)	25.30 [ab] (5.68)	37.83 [b] (7.30)	13.73 [a] (7.05)	(7, 50)	3.83**	.35
Positive Parenting	26.92 [a] (.77)	27.65 [a] (.69)	26.24 [a] (.88)	26.83 [a] (.85)	(6, 51)	2.55*	.23
Parental Involvement	42.94 [a] (1.38)	43.09 [a] (1.24)	40.97 [a] (1.58)	40.38 [a] (1.53)	(6, 51)	3.71**	.30
Parental Mon./Sup.	45.30 [a]	45.23 [a]	45.60 [a]	45.40 [a]	(6, 51)	1.22	.13

	(1.35)	(1.22)	(1.56)	(1.50)			
Inconsistent Discipl.	10.65 [a]	15.66 [b]	13.22 [ab]	13.63 [ab]	(6, 51)	3.33**	.28
	(1.08)	(.96)	(1.24)	(1.22)			

Note: Standard deviations are in parentheses; Disruptive Behaviors and Internalizing Symptoms composites are z-scores; means that do not share superscripts differ by $p < .05$ according to a Least Significance Difference (LSD) test; estimated marginal mean and standard error is displayed for each group. F-test is for the corrected model, including covariates. ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder; TD = typically-developing; Intern. Symptoms = Internalizing Symptoms; Mon./Sup. = Monitoring/Supervision; Discipl. = Discipline. Adaptive functioning and child age were entered as covariates for all dependent variables. Child gender and family income were also entered as covariates for the Disruptive Behaviors and Parental Distress variables. Child race was also entered as a covariate for the Internalizing Symptoms variable. Parent gender was also entered as a covariate for the Positive Parenting, Parental Involvement, and Parental Monitoring/Supervision variables. Parent race was also entered as a covariate for the Inconsistent Discipline variable.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Hypothesis 2

Hypothesis 2 predicted that parents of children with ASD+ADHD would report the highest level of internalizing symptoms for their children, followed by parents of children with ASD or ADHD, and then parents of TD children. The ANOVA was significant (Table 6), and pairwise comparisons demonstrated that children in the ASD+ADHD group exhibited significantly more internalizing symptoms than children in the TD group ($p < .001$) and marginally more internalizing symptoms than children in the ASD group ($p = .09$). However, contrary to what was predicted, children with ASD+ADHD did not exhibit significantly more internalizing symptoms than children within the ADHD group. Finally, children in the ASD group and the ADHD group exhibited more internalizing symptoms than TD children ($p = .01$ and $p = < .001$, respectively).

When covariates (child adaptive functioning, child age, and child race) were entered into an ANCOVA examining the effect of group on internalizing symptoms, the overall model was significant (Table 7), as was the effect of group, $F(3,51) = 5.72$, $p = .002$, partial $\eta^2 = .25$. Follow-up analyses revealed different findings than the ones outlined above. In this model, children in the ADHD group exhibited more internalizing symptoms than children in the ASD ($p = .01$) or TD group ($p < .001$), and children with ASD+ADHD exhibited marginally more internalizing symptoms than children in the TD group ($p = .09$). No other group differences were found.

Hypothesis 3

Hypothesis 3 predicted that parents of children with ASD+ADHD would report the highest level of parental distress, followed by parents of children with ASD or ADHD, and then parents of TD children. The ANOVA was significant (Table 6), and follow-up analyses demonstrated that parents of children in the ASD+ADHD group reported significantly higher levels of distress than parents of children in the ASD (p = .04) or TD (p < .001) groups. However, contrary to what was predicted, parents of children with ASD+ADHD did not report significantly higher levels of distress than parents of children in the ADHD group. As predicted, parents of children in the ADHD group reported higher levels of distress than children in the TD group (p = .02), but parents of children in the ASD group only reported marginally more distress than parents of children in the TD group (p = .07)

When covariates (child adaptive functioning, child age, child gender, and family income) were entered into an ANCOVA examining the effect of group on parental distress, the overall model was significant (Table 7), but the effect of group was nonsignificant, $F(3,50) = 2.19$, p = .10, partial η^2 = .12. Income was the only significant covariate, $F(1,50) = 3.58$, p = .06, partial η^2 = .07. Follow-up analyses indicated that parents of children in the ASD+ADHD group reported significantly higher levels of distress than parents of children in the ASD (p = .03) and TD group (p = .045). No other group differences were significant.

Hypothesis 4

Hypothesis 4 predicted that parents of children with ASD+ADHD would report the lowest level of positive parenting (Hypothesis 4A), lowest level of parental involvement (Hypothesis 4B), and highest level of inconsistent discipline (Hypothesis

4C), followed by parents of children with ASD or ADHD, and then parents of TD children. When ANOVAs were conducted to examine variations of positive parenting and parental involvement with respect to group, no main effect for group was found (Table 6). When levels of inconsistent discipline were examined, group differences emerged, and the overall model was significant (Table 6). Parents of children in the ASD+ADHD group and parents of children in the ADHD group reported higher levels of inconsistent discipline than parents of children in the ASD group ($p = .03$ and $p = .01$, respectively). No other group differences emerged.

ANCOVAs were then conducted to test Hypotheses 4A-4C. For the ANCOVA examining positive parenting, child adaptive functioning, age, and parent gender were entered into the model as covariates. The overall model was significant (Table 7), but the effect of group was nonsignificant, $F(3,51) = .58$, $p = .63$, partial $\eta^2 = .03$. Rather, the effect of the covariate parent gender was significant, $F(1,51) = 10.78$, $p = .002$, partial $\eta^2 = .17$. No group differences emerged in follow-up analyses.

For the ANCOVA examining parental involvement, child adaptive functioning, age, and parent gender were entered into the model as covariates. The overall model was significant (Table 7), but the effect of group was nonsignificant, $F(3,51) = 1.18$, $p = .33$, partial $\eta^2 = .07$. Instead, child adaptive functioning, $F(1,51) = 6.79$, $p = .01$, partial $\eta^2 = .12$, and parent gender, $F(1,51) = 5.86$, $p = .02$, partial $\eta^2 = .10$, were significant covariates. No group differences emerged in follow-up analyses.

For the ANCOVA examining inconsistent discipline, child adaptive functioning, child age, and parent race were entered in the model as covariates. The overall model was significant (Table 7), as were the effects of group, $F(3,51) = 3.99$, $p = .01$, partial η^2

= .19, and parent race, $F(3,51) = 5.72$, $p = .02$, partial $\eta^2 = .10$. Follow-up analyses indicated that parents of children in the ADHD group reported higher levels of inconsistent discipline than parents of children with ASD ($p = .002$). In addition, parents of children in the ASD+ADHD group reported marginally higher levels of inconsistent parenting than parents in the ASD group ($p = .08$). No other group differences emerged.

Hypothesis 5

With respect to Hypothesis 5, it was expected that parents of children with either ASD or ASD+ADHD would exhibit higher levels of monitoring/supervision than parents of children with ADHD only or parents of TD children. The ANOVA was nonsignificant (Table 6), with no differences emerging among any of the groups. When covariates (child adaptive functioning, child age, parent gender) were entered into the model, the overall model was nonsignificant (Table 7), as was the effect of group, $F(3,51) = .01$, $p = .998$, partial $\eta^2 = .001$. However, parent gender demonstrated a significant effect, $F(1,51) = 4.64$, $p = .04$, partial $\eta^2 = .08$, and child age was marginally significant, $F(1,51) = 2.92$, $p = .09$, partial $\eta^2 = .05$. No group differences emerged with respect to parental monitoring/supervision when accounting for covariates, which does not provide support for the hypothesis.

Hypothesis Testing: Multiple Regression Analyses for Hypotheses 6 to 8

Hypothesis 6

The current study also examined the association between child behaviors and symptoms (examined on a continuum) and parent factors. Hypothesis 6A specifically predicted that disruptive behaviors and internalizing symptoms would be positively related to parental distress above and beyond ASD symptoms and ADHD symptoms (measured

dimensionally) for all children. First, these hypotheses were tested without controlling for any demographic variables. ASD symptoms and ADHD symptoms were entered in the first step, and the overall model was significant, accounting for 37% of the variance in parental distress (Table 8). In this model, ASD symptoms accounted for a significant amount of unique variance in parental distress levels, whereas ADHD symptoms accounted for a marginal amount of unique variance. When disruptive behaviors were entered in the second step, neither ASD nor ADHD symptoms accounted for a significant amount of unique variance, but the addition of disruptive behaviors accounted for a marginally significant increase in variance explained above and beyond diagnostic symptoms (i.e., higher disruptive behaviors, higher parental distress), $R^2\Delta = .04$, F (1, 54) = 3.65, $p = .06$.

Table 8

Results of Multiple Regression Analyses of Child Characteristics Predicting Parent Factors (Hypotheses 6A-6B, 7A-7C, 7E, and 8)

Predictors	Criterion Variables				
	Parental Distress	Positive Parenting	Parental Involvement	Parental Mon./Sup.	Inconsistent Discipline
Model 1 Diagnostic Symptoms					
R²	**.37*** **	**.08†**	**.02**	**.09†**	**.08†**
ASD Symptoms	.42**	-.34†	-.18	-.39*	.05
ADHD Symptoms	.25†	.36*	.10	.21	.25
Model 2 Child Characteristics with Disruptive Behaviors					
R²	**.38*** **	**.10**	**.02**	**.16***	**.28*** **
***R²*Δ**	**.04†**	**.01**	**.001**	**.08***	**.20*** **
ASD Symptoms	.26	-.25	-.20	-.17	-.31†
ADHD Symptoms	.08	.46*	.07	.45*	-.13
Disruptive Behaviors	.36†	-.21	.05	-.50*	.81***

Model 2 Child Characteristics with Internalizing Symptoms					
R^2	**.38*** **	**.08†**	--	--	--
$R^2\Delta$	**.01**	**.01**	--	--	--
ASD Symptoms	.45**	-.29	--	--	--
ADHD Symptoms	.27†	.39*	--	--	--
Internalizing Symptoms	-.09	-.13	--	--	--

Note: R^2 and $R^2\Delta$ statistics are shown in **bold** for each model. Model 1 shows R^2; Model 2 shows $R^2\Delta$. Standardized regression coefficients reported for each predictor. ASD = autism spectrum disorder, ADHD = attention-deficit/hyperactivity disorder; Parental Mon./Sup. = parental monitoring and supervision.

† trend, $p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Secondly, this model was run controlling for child adaptive functioning, child gender, parent age, and family income. These demographic variables were entered in the first step, and the overall model was found to be significant, accounting for 27% of the variance in parental distress (Table 9). Specifically, adaptive functioning accounted for a significant amount of unique variance, with lower adaptive functioning being associated with higher parental distress levels. When ASD and ADHD symptoms were entered in the second step, the overall model remained significant and diagnostic symptoms accounted for a significant amount of additional variance (19%). Specifically, in this step, adaptive functioning was no longer significant; rather, family income and ASD symptoms were significant unique predictors. The addition of disruptive behaviors in the third step did not significantly improve the model, $R^2\Delta = .01$, $F\ (1, 50) = 1.03$, $p = .32$. Overall, these findings do not support the hypothesis that disruptive behaviors are positively related to parental distress levels above and beyond ASD and ADHD symptoms.

Table 9

Results of Multiple Regression Analysis of Disruptive Behaviors Predicting Parental Distress (Hypothesis 6A)

Predictor	Model 1 (Covariates)	Model 2 (Diagnostic Symptoms)	Model 3 (Disruptive Behaviors)
Adaptive Functioning	-.33*	.20	.12

Child Gender	-.12	-.05	-.03
Parent Age	-.10	.01	.02
Family Income	-.22	-.30*	-.27*
ASD Symptoms		.54**	.38
ADHD Symptoms		.23	.12
Disruptive Behaviors			.22
R^2	.27**	.46***	.47***
$R^2\Delta$		.19**	.01

Note. Standardized regression coefficients reported for each predictor; gender was coded 0 = male and 1 = female.

* $p < .05$. ** $p < .01$. ***$p < .001$.

To examine the role of internalizing symptoms in predicting parental distress (Hypothesis 6B), the same pattern of analyses was conducted (both with and without the same covariates). In both the models without and with demographic covariates, internalizing symptoms (entered in the second step and third step, respectively) did not explain a significant amount of additional variance, $R^2\Delta = .01$, F (1, 54) = .45, $p = .51$ (Table 8) and $R^2\Delta = .003$, F (1, 50) = .32, $p = .51$ (Table 10), respectively. These results do not support the hypothesis that internalizing symptoms are positively related to parental distress levels above and beyond ASD and ADHD symptoms.

Table 10

Results of Multiple Regression Analysis of Internalizing Symptoms Predicting Parental Distress (Hypothesis 6B)

Predictor	Model 1 (Covariates)	Model 2 (Diagnostic Symptoms)	Model 3 (Internalizing Symptoms)
Adaptive Functioning	-.33*	.20	.21
Child Gender	-.12	-.05	-.04
Parent Age	-.10	.01	.01
Family Income	-.22	-.30*	-.30*
ASD Symptoms		.54**	.57**
ADHD Symptoms		.23	.25†
Internalizing Symptoms			-.07
R^2	.27**	.46***	.47***
$R^2\Delta$		.19**	.003

Note. Standardized regression coefficients reported for each predictor; gender was coded 0 = male and 1 = female.

† trend, $p < .10$. *$p < .05$. ** $p < .01$. ***$p < .001$.

Hypothesis 7

It also was hypothesized that disruptive behaviors would be negatively related to positive parenting practices (Hypothesis 7A), parental involvement (Hypothesis 7B), and parental monitoring/supervision (Hypothesis 7C) above and beyond ASD and ADHD symptoms. Furthermore, it was hypothesized that disruptive behaviors would be positively related to inconsistent discipline above and beyond ASD and ADHD symptoms (Hypothesis 7E).

First, these hypotheses were tested without controlling for any demographic variables. In the regression model involving disruptive behaviors predicting positive parenting practices (Hypothesis 7A), ASD symptoms and ADHD symptoms were entered in the first step. This overall model was marginally significant, accounting for 8% of the variance in positive parenting practices (Table 8). In this model, ASD symptoms accounted for a marginal amount of unique variance in positive parenting practices, whereas ADHD symptoms accounted for a significant amount of unique variance. When disruptive behaviors were entered in the second step, only ADHD symptoms accounted for a significant amount of unique variance, and the addition of disruptive behaviors did not account for any additional variance explained above and beyond diagnostic symptoms, $R^2\Delta = .01$, F (1, 54) = .82, $p = .37$.

Secondly, this model was run controlling for child adaptive functioning and parent gender. These demographic variables were entered in the first step, and the overall model was found to be significant, accounting for 21% of the variance in positive parenting practices (Table 11). Specifically, parent gender accounted for a significant amount of variance, with mothers rather than fathers exhibiting a higher level of positive parenting practices. When ASD and ADHD symptoms were entered in the second step, the overall model remained significant but diagnostic symptoms did not account for a significant amount of additional variance, explaining only an additional 3%. Furthermore, the addition of disruptive behaviors in the third step did not significantly improve the model, $R^2\Delta = .02$, F (1, 52) = 1.70, $p = .20$. Overall, these findings do not

support the hypothesis that disruptive behaviors are negatively related to positive parenting practices above and beyond ASD and ADHD symptoms.

Table 11

Results of Multiple Regression Analysis of Disruptive Behaviors Predicting Positive Parenting (Hypothesis 7A)

Predictor	Model 1 (Covariates)	Model 2 (Diagnostic Symptoms)	Model 3 (Disruptive Behaviors)
Adaptive Functioning	.11	.10	.21
Parent Gender	.44**	.39**	.39**
ASD Symptoms		-.19	.02
ADHD Symptoms		.23	.39†
Disruptive Behaviors			-.31
R^2	.21**	.23**	.26**
$R^2\Delta$		.03	.02

Note. Standardized regression coefficients reported for each predictor; gender was coded 0 = male and 1 = female.

† trend, $p < .10$. ** $p < .01$.

When analyzing the regression model involving disruptive behaviors and parental involvement to test Hypothesis 7B, a similar pattern of results emerged. When testing the hypothesis without demographic controls, with ASD symptoms and ADHD symptoms entered in the first step, the overall model was not significant (Table 8). When disruptive

behaviors were entered in the second step, no additional variance was explained, and the model remained nonsignificant, $R^2\Delta = .001$, F (1, 54) = .04, $p = .85$.

Secondly, this model was run controlling for child adaptive functioning and parent gender. These demographic variables were entered in the first step, and the overall model was found to be significant, accounting for 24% of the variance in parental involvement (Table 12). Specifically, both child adaptive functioning and parent gender accounted for a significant amount of variance. Higher child adaptive functioning predicted higher levels of parental involvement, and mothers rather than fathers exhibited a higher level of parental involvement. When ASD and ADHD symptoms were entered in the second step, the overall model remained significant (with adaptive functioning and parent gender still predicting parental involvement), but diagnostic symptoms did not account for a significant amount of additional variance, adding only 6% in variance explained. Furthermore, the addition of disruptive behaviors in the third step did not significantly improve the model, $R^2\Delta = .02$, F (1, 52) = 1.80, $p = .18$. However, when disruptive behaviors were entered into the third step, ASD symptoms became a significant predictor (with higher ASD symptoms predicting higher levels of parental involvement) along with adaptive functioning and parent gender, accounting for a significant amount of variance in the model. Overall, these findings do not support the hypothesis that disruptive behaviors are negatively related to parental involvement above and beyond ASD and ADHD symptoms.

Table 12

Results of Multiple Regression Analysis of Disruptive Behaviors Predicting Parental Involvement

Predictor	Model 1 (Covariates)	Model 2 (Diagnostic Symptoms)	Model 3 (Disruptive Behaviors)
Adaptive Functioning	.37**	.67**	.77***
Parent Gender	.33**	.31*	.30*
ASD Symptoms		.32	.52*
ADHD Symptoms		.09	.25
Disruptive Behaviors			-.31
R^2	.24**	.30**	.32**
$R^2\Delta$		.06	.02

Note. Standardized regression coefficients reported for each predictor; gender was coded 0 = male and 1 = female.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Next, the regression model involving disruptive behaviors and parental monitoring/supervision was examined to test Hypothesis 7C. When ASD symptoms and ADHD symptoms were entered in the first step (i.e., no demographic controls), the overall model was marginally significant, accounting for 9% of the variance in parental monitoring/supervision (Table 8). In this model, ASD symptoms accounted for a significant amount of unique variance in parental monitoring/supervision, with parents of

children with fewer symptoms of ASD exhibiting higher levels of parental monitoring/supervision. When disruptive behaviors were entered in the second step, ASD symptoms no longer accounted for a significant amount of unique variance, but ADHD symptoms did. Parents of children with higher symptoms of ADHD exhibited higher levels of parental monitoring/supervision. Furthermore, the addition of disruptive behaviors accounted for a significant increase in variance explained above and beyond diagnostic symptoms, $R^2\Delta = .08$, F (1, 54) = 4.84, $p = .03$. Parents of children with higher levels of disruptive behaviors demonstrated lower levels of parental monitoring/supervision.

Next, this model was run controlling for child adaptive functioning and parent gender. These demographic variables were entered in the first step, with the overall model nonsignificant (Table 13). When ASD and ADHD symptoms were entered in the second step, however, the overall model was significant, with adaptive functioning, parent gender, and ASD symptoms all accounting for a significant amount of variance. Specifically, both lower adaptive functioning and fewer ASD symptoms were associated with higher levels of monitoring/supervision, and mothers rather than fathers were more likely to exhibit higher levels of monitoring/supervision. The addition of disruptive behaviors in the third step did not significantly improve the model, $R^2\Delta = .03$, F (1, 52) = 2.28, $p = .14$, and when disruptive behaviors were entered in the third step, parent gender remained the only significant predictor. Overall, these findings provide partial support for the hypothesis that disruptive behaviors are negatively related to parental monitoring/supervision. That conclusion was supported by the first set of analyses, but

when covariates were entered into the model, the hypothesis was no longer supported, suggesting that other factors may have a stronger relation to parental monitoring/supervision.

Table 13

Results of Multiple Regression Analysis of Disruptive Behaviors Predicting Parental Monitoring/Supervision (Hypothesis 7C)

Predictor	Model 1 (Covariates)	Model 2 (Diagnostic Symptoms)	Model 3 (Disruptive Behaviors)
Adaptive Functioning	.01	-.43*	-.31
Parent Gender	.26†	.26*	.26*
ASD Symptoms		-.61**	-.37
ADHD Symptoms		.04	.23
Disruptive Behaviors			-.36
R^2	.07	.22*	.25**
$R^2\Delta$		.15*	.03

Note. Standardized regression coefficients reported for each predictor; gender was coded 0 = male and 1 = female.

† trend, * $p < .10$. * $p < .05$. ** $p < .01$.

With respect to parental monitoring/supervision, it was hypothesized that disruptive behaviors would interact with ASD symptoms, in that the relation between disruptive behaviors and parental monitoring/supervision would be attenuated when ASD

symptoms were higher (Hypothesis 7D). To examine this hypothesis, two moderated multiple regression analyses were conducted, first one without covariates, and second, one with covariates. Prior to conducting the analyses, the scale for ASD symptoms (CSBQ Total score) was centered by subtracting the sample mean. The Disruptive Behaviors composite was already standardized with a mean of 0 and did not have to be centered. Next, the centered CSBQ Total score and the Disruptive Behaviors composite were multiplied to create an interaction term.

When examining without covariates, ASD symptoms and disruptive behaviors (main effects) were entered in the first step. This model was only marginally significant, accounting for 8% of the variance in parental monitoring/supervision, and neither predictor contributed significant unique variance (Table 14). When the interaction term was entered in the second step, the interaction term added a marginal amount of unique variance $R^2\Delta = .05$, $F\ (1, 54) = 2.98$, $p = .09$. Given that the interaction was not significant, it was not further explored via a *post hoc* plot.

Table 14

Results of Moderated Multiple Regression Analysis of Disruptive Behaviors by ASD Symptoms Predicting Parental Monitoring/Supervision without Covariates (Hypothesis 7D)

Predictor	Model 1 (Main Effects)	Model 2 (Interaction)
ASD Symptoms	-.09	-.15
Disruptive Behaviors	-.22	-.04

ASD Symptoms X Disruptive Behaviors		-.26†
R^2	.08†	.13†
$R^2\Delta$		.05†

Note. Standardized regression coefficients reported for each predictor.

† trend, * $p < .10$.

When the moderated multiple regression analysis testing Hypothesis 7D was conducted with covariates, child adaptive functioning and parent gender were entered in the first step of the model. This model was nonsignificant, but parent gender accounted for a marginal amount of unique variance (Table 15). When ASD symptoms and disruptive behaviors were entered in the second step, these variables together explained significant variance (17%), although neither contributed significant unique variance. Likewise, the overall model was significant, accounting for 23% of the variance in parental monitoring/supervision, with both child adaptive functioning and parent gender contributing significant unique variance. Finally, whereas the overall model remained significant when the interaction term was entered in the third step, the interaction did not explain unique variance in the parental monitoring/supervision (only 4%). In this model, only parent gender continued to predict significant unique variance, with both child adaptive functioning and ASD symptoms predicting a marginal amount of unique variance. Overall, the results of the moderated multiple regression analyses did not provide support for the hypothesis that ASD symptoms would moderate the relation between disruptive behaviors and parental monitoring/supervision.

Table 15

Results of Moderated Multiple Regression Analysis of Disruptive Behaviors by ASD Symptoms Predicting Parental Monitoring/Supervision with Covariates (Hypothesis 7D)

Predictor	Model 1 (Covariates)	Model 2 (Main Effects)	Model 3 (Interaction)
Adaptive Functioning	.01	-.39*	-.38†
Parent Gender	.26†	.29*	.28*
ASD Symptoms		-.40	-.45†
Disruptive Behaviors		-.21	-.05
ASD Symptoms X Disruptive Behaviors			-.23
R^2	.07	.23**	.27**
$R^2\Delta$		.17**	.04

Note. Standardized regression coefficients reported for each predictor; gender was coded 0 = male and 1 = female.

† trend , * $p < .05$. ** $p < .01$.

When analyzing the regression model involving disruptive behaviors predicting inconsistent discipline (Hypothesis 7E), first ASD symptoms and ADHD symptoms were entered in the first step. This overall model was marginally significant, accounting for 8% of the variance in inconsistent discipline, but neither set of diagnostic symptoms explained significant unique variance (Table 8). When disruptive behaviors were entered

in the second step, the addition of this variable significantly improved the model, accounting for an additional 20% of variance explained (i.e., higher disruptive behaviors, higher inconsistent discipline), $R^2\Delta = .20$, F (1, 54) = 14.73, $p < .001$. When this model was conducted controlling for child adaptive functioning and parent race, this pattern of results still held. Specifically, the demographic variables were entered in the first step, and the overall model was significant, accounting for 11% of the variance in inconsistent discipline (Table 16). In particular, parent race accounted for a significant amount of variance, with parents who identified as white reporting higher levels of inconsistent discipline than non-white parents. When ASD and ADHD symptoms were entered in the second step, the overall model remained significant as did the unique variance attributable to parent race, but diagnostic symptoms only accounted for a marginal amount of additional variance (9%; only ADHD symptoms demonstrated marginal unique variance, with a positive relation). The addition of disruptive behaviors in the third step significantly improved the model, $R^2\Delta = .13$, F (1, 52) = 9.85, $p = .003$, with more disruptive behaviors relating to higher levels of inconsistent discipline. This finding provides further support for the hypothesis that disruptive behaviors are positively related to inconsistent discipline above and beyond ASD and ADHD symptoms.

Table 16

Results of Multiple Regression Analysis of Disruptive Behaviors Predicting Inconsistent Discipline (Hypothesis 7E)

Predictor	Model 1 (Covariates)	Model 2	Model 3

		(Diagnostic Symptoms)	(Disruptive Behaviors)
Adaptive Functioning	-.15	.17	-.07
Parent Race	.31*	.32*	.22†
ASD Symptoms		.19	-.30
ADHD Symptoms		.29†	-.10
Disruptive Behaviors			.74**
R^2	.11*	.20*	.33**
$R^2\Delta$		.09†	.13**

Note. Standardized regression coefficients reported for each predictor; race was coded 0 = non-white and 1 = white.

† trend, $p < .10$. * $p < .05$. ** $p < .01$.

Hypothesis 8

Hypothesis 8 predicted that internalizing symptoms would be negatively related to positive parenting practices above and beyond ASD and ADHD symptoms. First, this hypothesis was tested without controlling for any demographic variables. ASD symptoms and ADHD symptoms were entered in the first step, yielding the same marginally significant finding as when testing Hypothesis 7A. When internalizing symptoms were entered in the second step, ADHD symptoms still accounted for a significant amount of unique variance, but the addition of internalizing symptoms was nonsignificant, $R^2\Delta = .01$, $F(1, 54) = .67$, $p = .42$ (Table 8).

Secondly, this model was run controlling for child adaptive functioning and parent gender, then ASD and ADHD symptoms in the second step, yielding the same findings as when testing Hypothesis 7A. The addition of internalizing symptoms in the third step did not significantly improve the model, $R^2\Delta = .02$, F (1, 52) = 1.46, $p = .23$ (Table 17). Overall, these findings do not support the hypothesis that internalizing symptoms are negatively related to positive parenting practices above and beyond ASD and ADHD symptoms.

Table 17

Results of Multiple Regression Analysis of Internalizing Symptoms Predicting Positive Parenting Practices (Hypothesis 8)

Predictor	Model 1 (Covariates)	Model 2 (Diagnostic Symptoms)	Model 3 (Internalizing Symptoms)
Adaptive Functioning	.11	.10	.12
Parent Gender	.44**	.39**	.41**
ASD Symptoms		-.19	-.11
ADHD Symptoms		.23	.27
Internalizing Symptoms			-.18
R^2	.21**	.23**	.25**
$R^2\Delta$		.03	.02

Note. Standardized regression coefficients reported for each predictor; gender was coded 0 = male and 1 = female.

** $p < .01$.

CHAPTER IV – DISCUSSION

Goals of the Current Study and Support of Hypotheses

The current study examined disruptive behaviors and internalizing symptoms in children with diagnoses of ASD+ADHD, ASD and ADHD, as well as TD children. This study also investigated how child diagnostic status and child behavioral characteristics, particularly disruptive behaviors, relate to parental distress and parenting practices.

Hypothesis 1 predicted that parents of children with ASD+ADHD would report the highest level of disruptive behaviors for their children, followed by parents of children with ASD or ADHD, and then parents of TD children. However, this hypothesis was only partially supported. Tests of group differences found that all children with an ADHD diagnosis, regardless of whether that diagnosis was comorbid with ASD, were reported to demonstrate higher levels of disruptive behaviors than children with ASD or TD children. Although previous research has demonstrated an association between disruptive behaviors and symptoms of both ADHD and ASD (Mash & Barkley, 2003; Sikora et al., 2013), these current findings highlight the association between ADHD and the particular disruptive behaviors of oppositionality, aggression, temper tantrums, and conduct disorder. This finding does not support the theory that a dual diagnosis of ASD+ADHD adds a cumulative risk with respect to disruptive behaviors. It is possible that the core difficulties for individuals with an ADHD diagnosis, such as difficulty inhibiting responses, difficulty focusing, hyperactivity, and/or problems with impulse control (Mash & Barkley, 2003) may make these children more vulnerable to exhibiting

disruptive behaviors, such as rule-breaking behaviors, defiance, and acting out. Although children with an ASD diagnosis were reported to exhibit higher levels of disruptive behaviors than TD children when control variables were not considered, when covariates were taken into account, children with an ASD diagnosis were no more likely to exhibit disruptive behaviors than TD children. Therefore, research should continue to examine how these other factors relate to disruptive behaviors in the context of an ASD diagnosis.

The same group differences were expected for internalizing symptoms (Hypothesis 2). However, this hypothesis was only partially supported. Even when covariates were taken into account, children with ADHD were reported to exhibit more internalizing symptoms than children with ASD or TD children. Children with dual ASD+ADHD diagnoses were found to exhibit significantly more internalizing symptoms than TD children (which was marginally significant when accounting for covariates). These findings suggest that children with ADHD may be more vulnerable to experiencing internalizing problems, such as depression or anxiety, than TD children or children with ASD alone. It is likely that, similar to disruptive behaviors, deficits experienced by individuals diagnosed with ADHD such as difficulty inhibiting responses, difficulty focusing, hyperactivity, and/or problems with impulse control (Mash & Barkley, 2003) make it more difficult for children with ADHD to regulate their emotions and cope with anxiety and depression. Other research supports this idea, including a study conducted by Walcott and Landau (2004), which suggested that inhibition deficits in children with ADHD may make it more difficult for them to regulate their emotions. Specifically, these authors assessed children with and without ADHD diagnoses, and they found that

children with ADHD scored higher on a measure of behavioral inhibition and also exhibited more trouble with regulating their emotions.

Additionally, these analyses do not suggest that children with an ASD diagnosis are more likely to exhibit internalizing symptoms than children with no diagnoses when accounting for other variables. As many children with ASD have been reported to also exhibit symptoms of anxiety, this finding is somewhat surprising. However, there are some possible explanations. First, it is possible that comorbidity between ASD and anxiety may be influenced by adaptive functioning level. A meta-analysis conducted by Van Steensel and Heeman (2017) found that differences in reported anxiety levels between children with ASD and typically-developing children increased as the children with ASD's IQ increased. Because children with ASD in this sample had lower adaptive functioning scores than the TD children, it is possible that much of the difference in anxiety level between the two groups was moderated by adaptive functioning. Anxiety in children with ASD who have lower adaptive functioning may present differently; for example, stereotyped or repetitive behaviors may be manifestations of anxiety (Uljarevic & Evans, 2017). As the current study assessed more typical presentations of anxiety (e.g., worry, panic), it is possible that some of the more meaningful expressions of anxiety for children with ASD were not assessed. It is also possible that this may explain the finding that the ASD+ADHD group did not significantly differ from the ASD group with respect to internalizing symptoms (although the ADHD group did differ from the ASD group). The anxiety symptoms in the ASD+ADHD group (which consisted of children with lower adaptive functioning) may have presented differently. Future

research studies could further examine how internalizing symptoms are moderated by adaptive functioning within this population as well as how to best assess anxiety in individuals with significant adaptive functioning deficits.

Again, the same group differences were expected for current, acute levels of parental distress (Hypothesis 3). When only the main effect of diagnostic group was examined, parents of children with ASD+ADHD reported the highest level of distress. Although parents of children with dual diagnoses reported more parental distress than parents of children with ASD only, they did not significantly differ from parents of children with ADHD. Parents of children with ASD+ADHD and ADHD reported higher levels of distress than parents of TD children, and parents of children with ASD reported marginally higher levels of distress than TD children. However, once control variables were considered, a main effect for diagnostic group on parental distress was not found. Parents of children with ASD+ADHD reported higher distress levels than parents of children with ASD or TD children, but the overall effect of group was nonsignificant. These findings provide some support for the hypothesis that having a child with an ASD or ADHD (in particular, an ASD+ADHD) diagnosis may be associated with a higher level of parental distress, but the magnitude of the effect size is only small to medium (partial $\eta^2 = .12$) when accounting for shared variance in parental distress attributable to demographic factors and adaptive functioning.

Although it was hypothesized that disruptive behaviors or internalizing symptoms may be key to predicting parental distress, other analyses did not support this conclusion. Neither disruptive behaviors nor internalizing symptoms were related to parental distress

above and beyond variance accounted for by other factors; thus, neither Hypotheses 6A nor 6B were supported. Rather, family income was the only unique predictor of parental distress when covariates, diagnostic symptoms, and disruptive behaviors were all taken into account simultaneously. Research has found that having a low family income is a risk factor for various forms of psychopathology, including anxiety and depression (e.g., Santiago, Wadsworth, & Stump, 2011), and this finding in the current study highlights the significance of that risk factor in the context of these specific diagnostic symptoms. In addition, it emphasizes the fact that low income is related to current, acute levels of distress. Other research has emphasized the mediating role of family income between parent symptomatology and child behavior problems, providing further support for the idea that income plays a key role in parental distress (Schleider, Patel, Krumholz, Chorpita, & Weisz, 2015). As mentioned in the literature review, a study conducted by Flouri et al. (2015) found that child diagnostic group differences in parental distress were only found among parents from disadvantaged rather than advantaged backgrounds, with economic and community supports acting as a buffer. As this study generally consisted of participants with higher incomes, it is possible that group differences were not as readily apparent.

It is important to note that when covariates, diagnostic symptoms, and internalizing symptoms (rather than disruptive behaviors) were all taken into account simultaneously, ASD symptoms remained a significant predictor of parental distress along with family income. Therefore, although no group differences were found between parents of children with ASD and parents of children without ASD with respect to

parental distress levels, the role of ASD symptoms in relating to current, acute levels of parental distress should be further explored. It is possible that disruptive behaviors account for much of the shared variance between ASD symptoms and parental distress, and when disruptive behaviors are removed from that model, ASD symptoms take on a stronger predictive role.

When testing group differences on positive parenting (Hypothesis 4A), a main effect for diagnostic group was not found. Therefore, these findings do not support the hypothesis. However, parent gender was a significant predictor of positive parenting, suggesting that parenting practices may be more closely linked to parent characteristics rather than characteristics of the child. Treating diagnostic symptoms continuously provided further support for this conclusion, as ASD symptoms, ADHD symptoms, disruptive behaviors, and internalizing symptoms were not significantly associated with positive parenting practices. In particular, Hypotheses 7A and 8—which predicted that disruptive behaviors and internalizing symptoms, respectively, would be negatively related to positive parenting practices above and beyond diagnostic symptoms—were not supported. Mothers rather than fathers reported higher levels of positive parenting practices, suggesting the possibility that positive parenting practices may be more frequently exhibited by mothers. In addition, it is possible that the relation between child characteristics/diagnostic symptoms and positive parenting practices may be moderated by parental gender, making that relation stronger or weaker depending on the gender of the parent. For example, a study conducted by Gryczkowski, Jordan, and Mercer (2009) found that the relation between various types of parenting practices and child

externalizing behaviors varied depending on both parent gender and child gender. Gryczkowski et al.'s findings suggest that not only does parent gender play a role in parenting practices, but it plays an even more nuanced role depending on the gender of the child. The findings of the current study with regard to parent gender suggest a need for further research to more closely examine the way that parenting practices differ based on parent gender, particularly with respect to children who have ASD and/or ADHD diagnoses.

When testing group differences on parental involvement (Hypothesis 4B), the hypothesis was not supported, given that a main effect for diagnostic group was not found. Similarly, disruptive behaviors were not a significant unique predictor of parental involvement; thus, there was no support for Hypothesis 7B. As mentioned in the literature review, past research examining these questions was limited, so this research study provided new insights despite the fact that these hypotheses were not supported. In this study, mothers were found to exhibit higher levels of parental involvement than fathers, and child adaptive functioning was positively correlated with parental involvement. Although this latter finding initially seems counterintuitive (i.e., it seems as if parents of children with lower adaptive functioning would be more involved in their child's life), when the parental involvement scale is viewed in more detail, this finding is plausible. Many of the items on the parental involvement scale used in this study assess volunteering at their child's school, assisting with their child's extracurricular activities, engaging in leisure activities with their child, and talking and conversing with their child. However, parents of children with significant adaptive difficulties may be so busy with

assisting in other aspects of their child's life, such as assisting them with daily living skills and teaching them basic forms of communication, they do not have time to engage in these other types of activities. Another finding is that ASD symptoms only predicted unique variance in parental involvement when accounting for the variance of disruptive behaviors. This finding suggests a possible interaction between ASD symptoms and disruptive behaviors, which should be explored in further research.

With respect to inconsistent discipline, it was expected that parents of children with ASD+ADHD would report the highest level of inconsistent parenting (Hypothesis 4C), followed by parents of children with ASD or ADHD, and then parents of TD children. This hypothesis was partially supported. Parents of children with ASD+ADHD and parents of children with ADHD reported higher levels of inconsistent parenting than parents of children with ASD even when accounting for controls. Furthermore, disruptive behaviors were positively related to inconsistent discipline above and beyond ASD and ADHD symptoms (as predicted by Hypothesis 7E), similar to the findings of the Kashdan et al. (2004) study outlined in the literature review. It is possible that higher levels of disruptive behaviors in children with ADHD may make it more difficult for parents to implement consistent discipline practices. It also is possible that inconsistent discipline may make it more challenging for children to learn how to minimize their disruptive behaviors. As mentioned in the literature review, a bi-directional relation is most likely (Mackler et al., 2015).

Although a group difference in inconsistent discipline was found between parents of children with ADHD and parents of children with ASD when accounting for controls,

a group difference did not emerge between parents of children with ADHD and parents of TD children. It is possible that the difference between the ADHD and ASD group only emerged because of the ASD group's tendency to demonstrate more consistent parenting, which may reflect the fact that children with ASD thrive with consistency and predictability (Brian & Gast, 2000). Although research has found that households which include a child with autism often consist of high levels of disruption and difficulties (Karst & Hecke, 2012), it is possible that parents of children with ASD may be more focused than parents of TD children on ensuring that their discipline practices are consistent and structured. There is a lack of research in this area, so further studies should investigate this possibility more closely.

With respect to parental monitoring/supervision, it was hypothesized that parents of children with ASD+ADHD and parents of children with ASD would exhibit higher levels of parental monitoring and supervision than the other two groups (Hypothesis 5). However, no main effect for group was found, and the hypothesis was not supported. Hypothesis 7C was partially supported, in that disruptive behaviors were uniquely associated with lower levels of parental monitoring/supervision when no covariates were entered in the model. However, this finding did not hold when covariates were taken into account, suggesting that the magnitude of the effect size of disruptive behaviors on parental monitoring/supervision is small.

It is important to note that it is possible that the scale selected to assess parental monitoring/supervision likely was not the best scale for assessing this construct among parents of children with ASD, as some of the items questioned whether children leave a

note to tell their parents when they are leaving the house or whether they stay out later than allowed. Based on the low adaptive functioning among the participants with ASD in the current study, these types of specific practices would not be as relevant for their parents. The nuances of these items may partially explain why the moderation analysis testing Hypothesis 7D (that the relation between disruptive behaviors and parental monitoring and supervision would be attenuated when ASD symptoms were higher) were nonsignificant, suggesting a need for further research to examine this issue when evaluating other methods of supervision/monitoring.

Limitations of the Current Study

This study examined a variety of child characteristics and parent factors, providing an array of information about child behaviors, parental distress levels, and parenting factors. Nonetheless, there are several limitations of the study that warrant discussion. One such limit of the current study involves diagnostic classification. This study relied on parent report regarding diagnostic status, and although criterion checks helped ensure that assignment to diagnostic group was appropriately manipulated, a standardized diagnostic assessment of ASD or ADHD was not conducted. In addition, because dual diagnoses of ASD and ADHD have only recently become more accepted in clinical practice, it is possible that some of the children who were reported to have ASD may in fact have also met criteria for ADHD but simply were not dually diagnosed at the time of their evaluation. Although it would be preferable to include a more formalized, structured diagnostic assessment in determining diagnostic group assignment, the complexities of such assessments made it not feasible for the current study.

Another limitation of the current study is the fact that parental distress levels and parenting practices may have been confounded by behavior problems exhibited by other children in the household. Although this study attempted to account for those factors by ensuring that no siblings had received any psychological diagnoses, it is possible that other children in the home may have exhibited significant behavior problems or internalizing symptoms not measured in the current study that impacted parental distress and the family unit. Future research should more closely examine the role of all children in the household when assessing parental distress and parenting practices.

As this study consisted of a highly skewed sample with regard to parent gender (i.e., 54 mothers and 4 fathers), definitive conclusions regarding the association between parenting practices and parent gender cannot be made. Many of the study results suggested that parent gender plays a significant role in parenting practices, but this study's ability to fully assess those differences was limited due to the very small number of respondents who were fathers. Future research that equally samples mothers and fathers should be conducted to better explore those questions.

Another limitation of the study has to do with the measures used to assess certain behaviors. As mentioned earlier, it is possible that some of the measures employed did not allow parents of children with significant adaptive difficulties to fully convey the methods they use regarding supervision/monitoring or fully capture the ways that their child expresses anxiety. The adaptive functioning of the children was not known prior to the start of the study, so it was not anticipated that the sample would consist of such a large number of participants with significant adaptive deficits. Future research studies

should include broader and more comprehensive measures that would be more applicable to members from that population.

This study provided relevant information regarding child characteristics, parental distress, and parenting practices. However, as this study consisted of correlational and quasi-experimental designs, it is important to remain mindful of the fact that causation cannot be assumed.

Future Directions and Clinical Implications

Although many of this study's hypotheses were not supported, various findings emerged that have important implications for clinical practice. First, this study speaks to the importance of taking into account demographic considerations, such as SES and parental gender, when working with families. As lower income parents reported higher levels of distress, it is important for clinicians who work with low-income clients to help them access community resources or find ways to mitigate financial or socioeconomic barriers that may lead to higher levels of family stress. Clinicians should also remain cognizant of differences in working with male versus female caregivers, as it is possible that certain gender roles may influence parenting styles.

Additionally, this study found that children with ADHD appear to be particularly at-risk for exhibiting disruptive behaviors and internalizing symptoms. Although disruptive behaviors often tend to present more overtly in clinical practice, the link between ADHD and internalizing symptoms should not be overlooked. Clinicians should remain aware of screening for symptoms such as anxiety and depression when working

with children with ADHD, even when treating children who present with more apparent disruptive behavior problems.

This study found that child disruptive behaviors account for a significant amount of variance in parental inconsistent discipline, above and beyond what would be expected given the presence of ASD and ADHD symptoms. Although directionality cannot be assumed, this finding does leave open the possibility that disruptive behaviors in children could decrease if their parents were taught to implement more consistent parenting strategies. Other research has suggested that improving the consistency of parenting practices may lead to less disruptive child behaviors (Mackler et al., 2015), so even though parenting a child with ADHD or disruptive behaviors may be challenging, parents can be taught to adopt certain parenting practices that may help to improve that situation.

Conclusion

The current study investigated group differences in child characteristics and parental factors among children with ASD+ADHD, ASD, ADHD, and no diagnoses. Disruptive behaviors appeared to be related to an ADHD diagnosis (either with or without comorbid ASD) and children with an ADHD diagnosis generally exhibited higher levels of internalizing symptoms than other children, suggesting that these children may be at particular risk for disruptive behavior problems or mood or anxiety difficulties. Although parents of children with dual diagnoses (ASD+ADHD) generally demonstrated the highest levels of parental distress, they did not differ from parents of children with ADHD. Likewise, a group effect was not found after considering control variables, particularly family income. Overall, this study did not find evidence to strongly

support the idea that dual ASD and ADHD diagnoses present a cumulative risk to children. As dual diagnoses of ASD and ADHD have only recently been permitted under APA guidelines, this finding is particularly important as there have not been a large number of studies yet to examine this issue. Family income was a significant predictor of parental distress, highlighting the significance of this risk factor when considering parental distress. Overall, parenting practices did not differ significantly based on diagnostic status, nor were disruptive behaviors and internalizing symptoms predictive of parenting practices, with only two exceptions. Specifically, parents of children with ADHD demonstrated higher levels of inconsistent discipline. Likewise, disruptive behaviors in children accounted for a unique amount of variance (above and beyond symptoms of ASD and ADHD) in predicting parental inconsistent discipline. These findings provide further support for considering ADHD and its associated disruptive behaviors when developing parenting interventions.

APPENDIX A – IRB Approval Letter

THE UNIVERSITY OF
SOUTHERN MISSISSIPPI.

INSTITUTIONAL REVIEW BOARD
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NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: CH2-17050401
PROJECT TITLE: Child Characteristics and Parent Factors in Children with ASD and/or ADHD: Disruptive Behaviors, Internalizing Symptoms, Parental Distress, and Parenting Practices
PROJECT TYPE: Change #2 to a Previously Approved Project
RESEARCHER(S): Elizabeth Fair
COLLEGE/DIVISION: College of Education and Psychology
DEPARTMENT: Psychology
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 05/05/2017 to 05/04/2018
Lawrence A. Hosman, Ph.D.
Institutional Review Board

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