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Relationships among parenting stress, parenting practices, and conduct problems in African American mothers of children with and without ADHD

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science at Virginia Commonwealth University.

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Abstract

RELATIONSHIPS AMONG PARENTING STRESS, PARENTING PRACTICES, AND CONDUCT PROBLEMS IN AFRICAN AMERICAN MOTHERS OF CHILDREN WITH AND WITHOUT ADHD

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Parents of children with attention-deficit/hyperactivity disorder (ADHD) endorse increased levels of parenting stress and subsequently employ ineffective parenting practices. For children with comorbid conduct problems, mothers report more parenting stress than mothers of children with ADHD alone. I investigated the relationships among child ADHD diagnostic status, parenting stress, parenting behaviors (i.e., involvement and positive parenting) and child conduct problems in 78 African American mothers of children with and without ADHD. Mothers completed a demographic questionnaire, a semi-structured clinical interview, the ADHD Rating scale (also completed by teachers), the Impairment Rating Scale, the Parenting Stress Index – Short Form, and the Alabama Parenting Questionnaire. Simultaneous multiple regressions indicated that both child ADHD and conduct problems significantly predicted parenting stress. However, these child variables did not predict parenting behaviors, and child conduct problems did not moderate the association between child ADHD and parenting stress. Results highlight how parenting stress may be the most integral target in psychosocial treatment for African

American mothers. Given this, future researchers should longitudinally investigate these relationships and clinicians should ensure parenting stress and child conduct problems are integrated into ADHD treatment.

Relationships among parenting stress, positive parenting, and conduct problems in African American mother of children with and without ADHD

Attention deficit/ hyperactivity disorder (ADHD) is a neurocognitive behavioral developmental disorder defined by pervasive and impairing age-inappropriate symptoms of inattention, impulsivity, and/or hyperactivity (American Psychiatric Association [APA], 2013). With impairing symptoms and negative outcomes persisting into adulthood for one-third of affected individuals (Biederman et al., 2010; Faraone, Biederman, & Mick, 2006; Langley et al., 2010), ADHD has been re-conceptualized by recent research as a chronic developmental disorder, classifying it as a major public health concern (Rowland, Lesesne, & Abramowitz, 2002). It is one of the most prevalent behavioral disorders, diagnosed in approximately 8% of 4 to 17-year olds in the United States (Polanczyk, et al., 2007; Visser et al., 2014) and 7.1% of youth worldwide (Thomas, O'Brien, Clarke, Liu, & Chronis-Tuscano, 2015). These rates vary by gender, with the ratio of ADHD in clinical samples ranging from 6:1 to 9:1 (male to female), and in nonclinical samples ranging from 2:1 to 3:1 (Kerig & Wenar, 2005).

According to the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5), to receive a diagnosis of ADHD, youth must demonstrate six or more symptoms of either inattention or hyperactivity/impulsivity, or both (see Table 1; APA, 2013). These symptoms must be present before the age of 12. Depending on their symptoms, youth may be diagnosed with an inattentive presentation, hyperactive/impulsive presentation, or a combined presentation (APA, 2013). Additionally, the DSM-5 requires that these symptoms be present for at least six months in more than one life setting (i.e., work, school, peers) and cause a lack of functioning in these domains (APA, 2013).

As noted above, children with ADHD exhibit impairment across multiple contexts, including at school, with peers, and at home (Antshel & Barkley, 2011; Visser et al., 2014). In the school context, inattentive symptoms may hinder the child's ability to focus, absorb information, and remain organized, which can result in the demands of school becoming particularly challenging (Rogers, Hwang, Toplak, Weiss & Tannock, 2011). On the other hand, hyperactive and impulsive symptoms can manifest as a child demonstrating disruptive behavior in the classroom, which may interrupt the learning process for other students (DeShazo, Barry, Lyman, & Klinger, 2002). These symptoms have also been shown to impact elementary teachers' subjective stress and frustration levels, with teachers rating children with ADHD as significantly more stressful to teach as compared to their classmates without ADHD (Greene, Beszterczey, Katzenstein, Park, & Goring, 2002). In particular, students with ADHD who also exhibit oppositional behavior and more extreme social impairment were rated as more stressful than students with ADHD who do not display these co-occurring behaviors (Greene et al., 2002). Further, children with ADHD are more likely than their peers without ADHD to obtain lower standardized test scores and to repeat a grade (Loe & Feldman, 2007; McConaughy, Volpe, Antshel, Gordon & Eiraldi, 2011). Unfortunately, these academic impairments persist from childhood into adolescence and even young adulthood (Biederman et al., 2010), as youth with ADHD take longer to graduate from high school than their peers and are less likely to attend and graduate college (Loe & Feldman, 2007).

Peer relationship formation and maintenance is another area of impairment for many children with ADHD. Generally, children with ADHD have fewer dyadic friendships, as they tend to be less well-liked by their peers (Hoza et al., 2005). The core symptoms of ADHD, such as an innate difficulty with sustained attention, can lead children with ADHD to exhibit

behaviors that are frustrating to others. For example, they are more likely to misinterpret social information (i.e. body language, tone of voice, nonverbal social cues) and to struggle with learning appropriate social behaviors modeled by family members or peers (Cunningham, Siegel, & Offord, 1985; Merrell & Wolfe, 1998). Collectively, these impairments cause children with ADHD to be less socially preferred and to fall in the rejected social peer status more often than other children their age (Hoza et al., 2005). In general, peer impairment for children with ADHD predicts negative short- and long-term outcomes (i.e., delinquency, academic difficulties), including the development of comorbid psychopathology (Hoza et al., 2005; Parker & Asher, 1987; Rubin, Bukowski, & Parker, 1998).

A child with ADHD also may experience impairment in the home context. Children diagnosed with ADHD tend to live in homes that have poorer family functioning overall and are characterized by lower levels of family cohesion, involvement, communication, and responsiveness, as well as greater parent conflict, compared to children without ADHD (Schroeder & Kelley, 2009). For example, children with ADHD often experience difficult parent-child relationships (DuPaul, McGoey, Eckert, & VanBrakle, 2001). This relationship is reciprocal, such that the behavior of children with ADHD may cause increased stress and burden to parents (Deault, 2010; Theule, Wiener, Tannock, & Jenkins, 2013), and parents of children with ADHD often utilize ineffective parenting strategies that serve to reinforce the child's maladaptive behavior (Johnston & Mash, 2001; Johnston, 1996). Further, this negative parent-child relationship continues into adolescence, with the increased conflict leading parents to appraise their child's behavior more negatively (Wiener, Biondic, Grimbos, & Herbert, 2016). Children with ADHD also have markedly increased conflict in their sibling relationships as compared to non-problem children (Mikami & Pfiffner, 2008). Specifically, children with

ADHD who have comorbid externalizing problems show an increased amount of sibling conflicts and a decrease in warmth and closeness with their siblings (Mikami & Pfiffner, 2008). Lastly, parents of children with ADHD reported lower limit setting than parents of children without ADHD (Schroeder et al. 2009). Limit setting is positively associated with greater self-regulation and fewer hyperactive/impulsive symptoms (Graziano, McNamara, & Geffken, 2011). Conversely, a lack of limit setting has been shown to negatively impact the home environment (Graziano et al., 2011; Mulligan et al., 2013). Thus, if a child with ADHD exhibits less self-regulation, his/her behaviors may additionally contribute to the overall challenges parents of children with ADHD experience in maintaining family structure (Biederman et al., 2002). Overall, as a result of the increased burden reported by parents and the increased conflict reported by parents and siblings, children with ADHD tend to have less organized and structured family environments.

Moreover, in regards to how parents cope with their child's ADHD at home, parents of children with ADHD tend to have fewer extended family whom they feel they can contact for support, and perceive that the contacts they do have to be less helpful (Cunningham, Bemness, & Siegel, 1988; Podolski & Nigg, 2001). Specifically, mothers of children who exhibit more severe ADHD symptoms may experience greater intensity of distress in their parenting role, and thus, need increased types of support (e.g., from their community) in order to reduce this distress in the home (Cunningham et al., 1988). Additionally, the externalizing problems of a child with ADHD can impact the home context by reducing a parent's perceived and actual levels of social support (Crowley & Kazdin, 1998). This may subsequently increase parental conflict and in the short term, lead to a lack of organization, and in the long term, result in a severe deficit in family functioning (Crowley & Kazdin, 1998; Lange, Sheerin, & Carr, 2005; Pruett et al., 2003).

Generally, a more supportive home environment was also associated with lower rates of oppositional and conduct problems children with ADHD (Mulligan et al., 2013). In sum, these factors (i.e., increased parental distress and need for social support) can reduce the quality of life of parents of children with ADHD (Lange et al., 2005).

Additionally, ADHD is very costly to society, with the overall economic impact of ADHD approximated to be $36-$52 million per year (Pelham, Foster, & Robb, 2007; Tucker & Dixon, 2009). Particularly for children with comorbid conduct problems, this amount is a result of ADHD's association with increased juvenile justice system interactions, healthcare visits, and at times increased special education services (Pelham et al., 2007). Overall, ADHD can affect multiple areas of a child's life and may cause not only psychological difficulties, but also legal and medical troubles. Despite the numerous detrimental effects that ADHD has on the economy, families, and most importantly, children (Pelham et al., 2007), a number of families fail to seek treatment (Bussing et al., 2005).

Conduct problems. Finally, children with ADHD are at risk for short- and long-term negative outcomes, including comorbid mental health problems. Specifically, conduct problems are the most prevalent comorbid psychopathology with ADHD (Dadds, Maujean, & Fraser, 2003). Conduct problems can include aggressive behaviors like stealing, lying, noncompliance, and violations of rules (Dadds et al., 2003). These conduct problems can be very costly to the education, community service, health, and justice systems as a result of the social, health, and academic problems they can cause in the long term without effective treatment (Loeber & Farrington, 2000). As conduct problems are the most consistent predictors of social deficits (e.g., maladaptive goal setting, miscoding and hostile interpretation of social cues, and selection of aggressive responses) for children with ADHD (Mikami & Pfiffner, 2008; Pfiffner, Calzada, &

McBurnett, 2000) and lead these children to be rejected consistently by peers (Erhardt & Hinshaw, 1994), understanding the development and prevalence of these comorbid conduct problems, as well as how they uniquely impair a child with ADHD, is important to treatment and future prevention.

Overall, the greater prevalence of conduct problems in children with ADHD, as compared with the general population, shows that having ADHD increases the odds of developing comorbid disruptive behavioral disorders (Connor, Steeber, & McBurnett, 2010; Waschbusch, 2002), including Oppositional Defiant Disorder (ODD) and/or Conduct Disorder (CD; Larson, Russ, Kahn, & Halfon, 2011; Waschbusch, 2002). An estimated 60% of children with ADHD experience co-occurring ODD and approximately 20% of children with ADHD experience co-occurring CD (Connor et al., 2010; Biederman, 2005). ODD and CD are characterized by persistent patterns of angry or irritable mood and aggressive, defiant behavior towards authority figures or the rules of society (APA, 2013). Specifically, the essential feature of ODD is a recurrent pattern of disobedient and hostile behavior towards authority figures, whereas the essential feature of CD is a persistent pattern of violating age appropriate societal norms and rules or the basic rights of others (Connor et al., 2010). In general, studies have shown that when comorbid with ADHD, children exhibit oppositional behaviors of a mild to moderate intensity; however, children with moderate to severe intensity behaviors and symptoms are more likely have sole diagnoses of OD or CD (Reiff & Stein, 2003). Further, a patient can have oppositional symptoms or conduct problems without having the diagnosis of ODD or CD. Overall, the prognosis, course, and types of impairment seen in ADHD treatment can be severely altered and complicated by these comorbidities (Connor & Doerfler, 2008; Connor et al., 2010).

When conduct problems occur with ADHD, life functioning can be severely impacted. Specifically, comorbid ODD and CD symptoms in children with ADHD can disrupt family structure and cohesion, educational outcomes, and psychosocial health (Connor et al., 2010). In regards to family functioning, comorbid conduct problems are associated with increased family conflict, decreased warmth and closeness with siblings, reduced positive parenting, increased parental psychopathology, and generally more cumulative family stress (Connor et al., 2010; Pfiffner, McBurnett, & Rathouz, 2005). Additionally, children with ADHD and comorbid conduct problems experience poorer educational outcomes than children with ADHD alone (Connor & Doerfler, 2008; Connor et al., 2010). Additionally, youth with ADHD and comorbid conduct problems are at an increased risk for development of other psychiatric comorbidities, such as major depression (Biederman et al., 1996; Connor et al., 2010). Once a child or adolescent with ADHD develops comorbid conduct problems, their psychosocial health and overall self-reported quality of life becomes poorer compared to someone without such comorbidities (Klassen, Miller, & Fine, 2004). Thus, all of these factors demonstrate a need for ADHD treatment to consider and comprehensively address both ADHD and any comorbid conduct problems.

Parenting Children with ADHD

Parenting behaviors. Given the prevalence, high rates of psychiatric comorbidity, and functional impairment experienced by children with ADHD, parents of children with ADHD may be faced with unique difficulties in managing their children's behavior. Research has demonstrated that interactions between parents and children with ADHD are transactional, such that the negative problem behaviors of the child elicit negative parenting practices (Webster-Stratton & Hammond, 1990). Consequently, in families of children with ADHD, the parent-child

relationship consists of more negative behaviors on the part of both parents and children (Chronis-Tuscano et al., 2008). Specifically, parents of children with ADHD employ fewer positive and more negative-reactive parenting strategies (Johnston, 1996; Pimentel, Vieira-Santos, Santos, & Vale, 2011). Compared to mothers of children without ADHD, mothers of children with ADHD respond with more directive commands, supervision, and fewer rewards for compliance during structured tasks (Barkley, Anastopoulos, Guevremont, & Fletcher, 1992). Additionally, children with ADHD tend to display less compliance and more opposition in these tasks and towards parental demands (DuPaul et al., 2001). Compared to children without ADHD, when interacting with their parents, children with ADHD tend to display more emotional negativity as well as oppositional and aggressive behaviors (Barkley et al., 1992). Overall, the challenges of parenting a child with ADHD have been well-documented and many dimensions of parenting are negatively impacted by having a child with ADHD. Thus, use of measurements that tap into the most relevant dimensions of parenting for parents of children with ADHD are integral to the development of behavioral interventions that help improve the child's behavior.

As a result of the multidimensional nature of parenting, many measurements exist to assess different domains of parenting, including measures to evaluate parent's levels of stress, competence, efficacy, and psychopathology (Smith, 2011). Because evidence-based psychosocial interventions for ADHD focus on modifying parenting strategies so that the parent can better manage his or her child's behavior (Pelham & Fabiano, 2008), assessment that reliably and validly measures parents' behaviors is critical for intervention. The majority of research studies examining parenting among caregivers of children with ADHD use self-report measures (e.g., Gordon & Hinshaw, 2017; Heath et al., 2015; Johnston, Mah, & Regambal, 2010), which are typically measures that provide a list of statements that describe a variety of parenting practices

of which a caregiver may employ. Caregivers are then instructed to rate on a Likert or rating scale how often he/she employs the parenting practice or strategy.

One of the most commonly used measures of parenting behavior in studies of children with ADHD is the Alabama Parenting Questionnaire (APQ; Shelton, Frick, & Wootton, 1996). The APQ is a 42-item measure that is designed specifically to evaluate parenting in caregivers of children with behavior problems. The questionnaire measures five dimensions of parenting:(1) positive involvement with children, (2) supervision and monitoring, (3) use of positive discipline strategies (4) consistency in the use of this discipline, and (5) use of corporal punishment. It is designed for parents of children aged 6-18 years. The APQ has demonstrated good psychometric properties. For instance, when differentiating between clinical and nonclinical samples, the APQ has strong criterion validity (Dadds, Maujean, & Fraser, 2003). Additionally, Shelton and colleagues (1996) reported adequate convergent validity across interview and rating methods (parent version: r = .37, child version: r = .35). Most of the subscales, child and parent, have exhibited adequate internal consistency, with the consistent exception being the Corporal Punishment and Poor Monitoring/Supervision scales (Dadds et al., 2003; Essau, Sasagawa, & Frick, 2006; Shelton et al., 1996). For example, Dadds and colleagues (2003) found the Cronbach's alpha for the three other subscales to be moderately high (Parental Involvement α = 0.75, Positive Parenting α = 0.77, and Inconsistent Discipline α = 0.73) as compared to the two much lower subscales (Poor Monitoring/Supervision α= 0.59 and Corporal Punishment α =0.55).

Similar psychometric patterns have been found in other studies as well (see Shelton et al., 1998 and Essau et al., 2006). Specifically, after examining the German translation of the Child Global Report version of the APQ, Essau and colleagues (2006) found acceptable internal consistency for the Positive Parenting (mothers' α= .79, fathers' α=.82), Parental Involvement

(mothers' α= .74, fathers' α=.81), Poor Monitoring/Supervision (mothers' α= .81 fathers' α=.83), and Corporal Punishment subscales (mothers' α= .83, fathers' α=.79), but not for the Inconsistent Discipline subscale (mothers' α= .62, fathers' α=.54). In addition, Essau and colleagues (2006) found that the Inconsistent Discipline and Corporal Punishment subscales, for both father and mother data, had weak correlations with the other factors. Additionally, the APQ exhibited strong reliability and construct validity with a sample of Latinx, Spanish-speaking parents for the subscales of Positive Parenting (α=.70) and Positive Involvement (α=.70), and the APQ subscale of Positive Involvement demonstrated good construct validity for the sample (Haack, Gerdes, Schneider, & Hurtado, 2011). However, in other studies with Spanish-speaking samples, the reliability of the other three subscales (i.e., Corporal Punishment, Poor Monitoring/Supervision, and Inconsistent Discipline) has been weaker (i.e., ≤0.70; Hack et al., 2011). Further, in Haack and colleagues' (2011) sample of Latinx parents, the Inconsistent Discipline and Poor Monitoring/Supervision subscale also did not exhibit good construct validity. Thus, there is preliminary evidence that, for ethnically diverse samples, the Positive Parenting and Positive Involvement subscales of the APQ may be most psychometrically strong.

In studies of parenting in families of children with ADHD using the APQ, researchers have found reciprocal relationships between ADHD and parenting. For example, before behavioral parent training, parents of children with ADHD report less positive involvement and more inconsistent discipline and corporal punishment on the APQ (Gerdes, Haack, & Schneider, 2012; Hinshaw et al., 2000). After behavioral parent training, fathers report engaging in more positive involvement; mothers report less inconsistent discipline and corporal punishment (Gerdes et al., 2012). When using the APQ to assess parenting behaviors for parents of children with ADHD, higher levels of maternal positive parenting have been associated with lower child

aggression (Kaiser, McBurnett, & Pfiffner, 2010), and higher levels of negative parenting (i.e., inconsistent discipline and corporal punishment subscales) for fathers is linked to increased amounts of child aggression (Kaiser et al., 2010). As a result of these linear relationships between ADHD and self-reported parenting, the APQ seems to be a reliable and valid measure for the assessment of parenting behavior in studies of children with ADHD.

Parenting stress. Parenting a child with ADHD can induce high levels of stress for parents (Peters & Jackson, 2009; Pimentel et al., 2011). Parenting stress is characterized by a parent feeling a perceived lack of resources for dealing with his/her demands (Fischer, 1990). Abidin (1992) proposed that aversive feelings of parenting stress result from a mismatch of two variables: parenting demands and resources available to meet those demands. Both individual studies and meta-analyses have concluded that parenting a child with ADHD is more stressful than parenting a child without ADHD (Anastopoulos, Sommer, & Schatz, 2009; Graziano, McNamara, Geffken, & Reid, 2011; Peters & Jackson, 2009; Podolski & Nigg, 2001; Theule et al., 2013). Specifically, parents of children with ADHD report more frequent daily parenting hassles (i.e., the small but recurrent, day-to-day challenges that impede completion of basic parenting tasks) and more intense stress from these daily hassles than parents of children without ADHD (Walerius, Fogleman, & Rosen, 2016). For instance, parents may take on an array of tasks involved in ADHD treatment such as tracking appointments, administering medication, negotiating with the school system for accommodations and special services (i.e., Individualized Education Programs, Section 504 Plans) and managing their child's general care. Additionally, parents of children with ADHD report the high levels of stress to be linked to externalizing child problem behavior, specifically hyperactivity/impulsivity and conduct problems (Anastopoulos,

Guevremont, Shelton, & DuPaul, 1992; Deault, 2010; Jones, Putt, Rabinovitch, Hubbard, & Snipes, 2016; Pimentel et al., 2011).

Racial and ethnic variations in parenting stress have been reported and may be attributable to varied cultural approaches to caregiving. For example, when research has explored caregiver stress and burden in caregivers of elderly family members or adults with acute and/or chronic conditions (e.g., diabetes, cancer, etc.), racial and ethnic differences have been reported (Janevic & Connell, 2001). Specifically, African American caregivers endorsed less stress and depressive symptoms than Non-Latino White caregivers; some hypothesize this relationship to be the result of African American caregivers reporting more positive perceptions of their caregiving roles (Dilworth-Anderson et al., 2005; Janevic & Connell, 2001). Despite reporting less caregiver stress, African American caregivers have been reported to have greater burden and increased health problems and higher mortality rates (Hinojosa, Hinojosa, Fernandez-Baca, Knapp, Thompson, 2012). Thus, cultural variations (e.g., family support networks, intensity vs. perception of caregiving duties, etc.) are important to consider when exploring potential racial and ethnic differences in parenting stress for parents of children with ADHD.

One limitation of the parenting stress literature with regard to ADHD is that previous research has lacked racial and ethnic diversity and has primarily utilized White samples (Johnston & Mash, 2001). Thus, parenting stress in African American families with children with ADHD has been under-researched (Hinojosa et al., 2012). However, when research has explored parenting stress in African American families of children with ADHD, differences in parenting stress and behavior between African American and White parents have been observed (Hinojosa et al., 2012). This disparity is important, because African American children tend to have higher ADHD symptom severity (DuPaul, et al., 2016) and higher rates of comorbidities

with other emotional and behavioral disorders (Nolan, Gadow, & Sprafkin, 2001); therefore, by the time ADHD assessment and intervention occurs, African American parents of children with ADHD may experience even more parenting stress as compared to African American parents of children without ADHD or other racial/ethnic parents of children with ADHD. As noted, development of dysfunctional parent–child relationships can arise from the psychological distress parenting demands can cause. This distress can be a risk factor for both child and adult psychopathology (Deater-Deckard, 1996).

One of the most commonly used measures of parenting stress in studies of children with ADHD is the Parenting Stress Index (PSI; Abidin, 1995). The PSI was ultimately created in order to examine the diversity of potential influences on parenting practices (Anastopoulos et al., 1992). As a result of the difficulty in defining parenting stress as a construct (i.e., proximal and distal, child, parent, and contextual variables), the parenting stress measurement has experienced some challenges. The Parenting Stress Index – Short Form (PSI-SF; Abidin, 1995) was derived from a series of exploratory factor analyses of the full PSI in order to provide a briefer screening of parenting stress with only 36 items (Reitman, Currier & Stickle, 2002). The PSI-SF requires the caregivers to assess this relationship as the degree to which they agree with various statements on a 5-point Likert scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). The PSI-SF yields subscales that measure parental distress, child distress, and parent-child dysfunctional interaction. The PSI-SF produces an overall parenting stress total score with higher scores indicating a greater level of stress.

The PSI-SF has demonstrated strong psychometric properties. The internal consistency and test-retest reliability of the PSI-SF have been evidenced in numerous studies (Gordon & Hinshaw, 2017). Abidin and Brunner (1995) found the Cronbach's alphas to range from .80 to

.87, and large-scale studies (e.g., Abidin, 1995) have found good test–retest reliability (.85) (Rogers, Wiener, Marton, &Tannock, 2009). In Gordon & Hinshaw (2017)'s examination of parenting stress in parents of girls with ADHD, the Parental Distress subscale displayed strong internal consistency (α=.85). Similarly, Graziano and colleagues' (2011) study of child self-regulation difficulties and parenting stress found the total stress raw score to exhibit good internal consistency (α = 0.93). Additionally, use of PSI-SF has been validated with lower socioeconomic, primarily African American mothers (Reitman et al., 2002).

On the PSI-SF, parents of children with ADHD report higher levels of parenting stress (Gordon & Hinshaw, 2017; Graziano et al., 2011; Jones et al., 2016; Rogers et al., 2009). Overall, mothers of girls with ADHD report more parental stress due to dysfunctional interactions (PCDI) and parental distress (PD) than mothers of nonclinical children (Gordon & Hinshaw, 2017). Additionally, as aforementioned, parents had higher self-reported scores on the PSI-SF if they reported that their child had higher severity levels of hyperactivity/impulsivity (Graziano et al., 2011). Finally, parents with higher scores on the PSI-SF also indicated more controlling parental involvement (Rogers et al., 2009). That is, even parents of children with mostly inattentive symptoms of ADHD self-reported more parenting role distress, and in doing so, described interactions with their children around school-based tasks to be less pleasant and more hostile (Rogers et al., 2009). Therefore, many studies confirm, when using the PSI-SF, that parents of children with ADHD globally experience significant amounts of parenting stress as compared to parents of children without.

Parenting children with comorbid conduct problems. The stressful and demanding nature of parenting a child with ADHD, especially one with comorbid conduct problems, can lead parents to experience increased stress in their parenting role (Deault, 2010). In general,

conduct problems, more than ADHD symptoms, are associated with increased family conflict (Barkley et al., 1992; Deault, 2010). Specifically, mothers of children with ADHD and comorbid conduct problems report more parenting stress, depression and anxiety symptomatology, substance dependence, and drinking problems (Chronis et al., 2007; Deault, 2010). Additionally, co-occurring aggressive or oppositional behaviors also negatively impact fathers, such that, fathers often report being distressed by disruptive child behaviors (Podolski & Nigg, 2001). Mothers, however, experience parental role distress from both child disruptive behaviors and inattentive symptoms (Deault, 2010; Podolski & Nigg, 2001). Taken together, parenting stress is associated with the use of more harsh, critical, and inconsistent parenting strategies and a lower sense of competence in families of children with ADHD (Johnston, 1996; Mash & Johnston, 1983; Thomas et al., 2015). As a result, children with ADHD and comorbid conduct problems tend to have poorer outcomes. For example, although parenting stress has been linked to high levels of readiness to change (Jones et al., 2016), it also is related to treatment engagement and drop-out (Williamson, Johnston, Noyes, Stewart, & Weiss, 2017). Thus, it seems that parenting a child with ADHD and comorbid conduct problems creates more stress and conflict for parents.

Additionally, comorbid conduct problems and disruptive behavior disorders are associated with dysfunctional or negative parenting practices (Connor et al., 2010; Johnston & Jassy, 2007). Specifically, harsh, inconsistent, and unresponsive parenting behaviors are most related to oppositional behavior and symptoms of CD in children with ADHD, when controlling for preexisting child problems (Drabick, Gadow, Sprafkin, 2006). Specifically, some studies hypothesize that the relationship between parenting and child conduct problems in children with ADHD is transactional (Johnston, Murray, Hinshaw, Pelham, & Hoza, 2002). For mothers and fathers, negative and ineffective discipline was associated with comorbid ODD and CD (Pfiffner

et al., 2005). Specifically, symptoms of ODD are predictive of less positive parenting (e.g., lack of positive parental involvement and warmth) (Kashdan et al., 2004). Overall, many children and adolescents with ADHD experience comorbid conduct problems; thus, the challenges these comorbid conduct problems and behaviors pose for parents' stress and parenting behaviors are important to understand so that treatment targets can be appropriately chosen (Podolski & Nigg, 2001).

ADHD in African American Youth

Characteristics of African American youth with ADHD. A significant limitation of the ADHD research literature to date has been the lack of specific studies of African American children with ADHD. Although the incidence of ADHD appears to be similar in African American and White populations (Bailey & Owens, 2005), African American youth are under-diagnosed compared to White youth (Hervey-Jumper, Douyon, & Franco, 2006; Lee, Oakland, Jackson, & Glutting, 2008) and subsequently under-treated (Bailey & Owens, 2005). When research has explored ADHD in African American communities, it has shown African American children to have higher symptom severity (DuPaul, et al., 2016; Evans et al., 2013; Reid, 1995) higher rates of comorbidities with other emotional and behavioral disorders (Nolan et al., 2001; Pelham, Wheeler, & Chronis, 1998), and lower levels of treatment utilization (Chow, Jaffee, & Snowden, 2003; Froehlich et al., 2007) These treatment discrepancies between other racial groups have significant implications for African American children's development, as inadequate or delayed treatment is associated with higher rates of at risk behaviors (e.g. delinquency, incarceration, teen pregnancy) in adolescence and adulthood (Hervey-Jumper et al., 2006).

African American children have consistently been shown to be rated higher on measures of symptoms of ADHD and impairment than White youth (Hervey-Jumper et al., 2006), and this persists into adolescence (Evans et al., 2013). Many studies have indicated that teachers in particular report African American youth to have more ADHD symptoms than White youth (DuPaul et al., 2016; Miller, Nigg, & Miller, 2009; Reid, 1995). Miller and colleagues (2009) noted that across the most widely-used teacher rating scales for ADHD, including the SNAP-IV and the Connors Scale (1997), differences in high symptom scores based on race existed. Even more recently, DuPaul and colleagues (2016) found after analyzing the fit of the 2-factor structure of ADHD based in the DSM-5 conceptual model and alternative models of the ADHD Rating Scale-5, that teachers rated non-Hispanic African American children higher than their non-Hispanic White, Hispanic, and Asian counterparts. Additionally, racial differences in ratings of ADHD symptomatology persisted when using classroom observations, such that African American boys' higher rate of classroom behavior problems explained these differences, instead of a teacher rating bias (DuPaul et al., 2016). However, solely using teacher report measures may have some impact on the symptom severity discrepancies as research has shown teachers to blame ADHD for behavior or learning problems more often in African American youth (Bailey & Owens, 2005) and to generally view African American youth more negatively than White youth (Abikoff, Courtney, Pelham, & Koplewicz, 1993; Tucker & Dixon., 2009). This pattern of high reported ADHD symptomatology may be due to a variety of factors including: a lack of accurate assessment and diagnosis tools that may not adequately capture ADHD manifestation in African Americans (Miller et al., 2009), cultural differences in perceptions of children's behavior (Cuffe, Moore, & McKeown, 2005), parental beliefs about ADHD (Miller et al., 2009), and

potentially the impact poverty has on access to mental health services treatment (Tucker & Dixon, 2009).

The limited research on comorbidities in African American children with ADHD has suggested that these children overall have higher levels of comorbid psychopathology (i.e., Oppositional Defiant Disorder, Major Depression, Bipolar Disorder, and Separation Anxiety), than African American children without ADHD (Samuel et al., 1998). This is the same relationship often observed in White samples (Miller et al., 2006). However, when compared to a White sample that used the same measurement, African American children with ADHD had more modest comorbidity levels with other disruptive behavior and anxiety disorders, yet had more consistent comorbidity with mood disorders (Biederman et al., 1996; Miller et al., 2006). Although there has been limited research for these phenomena, one hypothesis may be that due to the delay in African American families' treatment seeking and the general underutilization of mental health services, ADHD symptoms may not be assessed until very severe; thus, treatment may not be as effective and comorbidities may be more present (Miller et al., 2006). Additionally, research has shown a trend of teachers mislabeling African American children's ADHD symptoms as oppositional at higher rates than mislabeling of their White peers with the same symptoms (Rabiner, Murray, Schmid & Malone, 2004; Reid et al., 2001). Although these higher behavior ratings could possibly be explained by the unique manifestation of ADHD in African American children, additional research on the comprehensive assessment of ADHD is necessary to explore whether more severe ADHD symptoms are accompanied by a diverse presentation of comorbidities in African American children with ADHD (Miller et al., 2006).

Mental health disparities. Though African American children have higher reported symptoms and unique comorbidities, they are diagnosed with ADHD only two-thirds as often as

White youth (Miller et al., 2009) and have lower levels of treatment utilization, especially though the medical sector (Leslie et al., 2003; Stevens, Harman, & Kelleher, 2005). Research suggests African Americans in impoverished neighborhoods were more likely than their White, Asian, and Hispanic peers in poverty to be referred for mental health services, yet they were less likely to use and receive them (Bussing, Schoenberg, Perwien, 1998; Chow, Jaffee, Snowden, 2003). Generally, African American children have higher rates of unmet ADHD treatment (Bussing et al., 1996; Tucker & Dixon, 2009). According to Ellison and colleagues (2002) only 28% of African American boys who were reported as displaying ADHD symptoms received a formal evaluation and diagnosis of ADHD as compared to 51% of White peers. Racial differences among African American youth and Hispanic and White peers subsequently persist with medication treatment and usage (Olfson et al., 2003). Froehlich and colleagues (2007) observed that the poorest children fulfilling DSM-IV ADHD criteria were three to five times less likely than other income groups to receive consistent medication treatment. This may be particularly harmful for African Americans, as they constitute 22 percent of individuals living in poverty, compared to roughly 11 percent of Whites (U.S. Department of Commerce, 2016).

Overall, African American families hesitate to request ADHD assessments and are less likely to receive treatment (Bussing et al., 2003; Froehlich et al., 2007). There are a host of factors that seem to predict this behavior, including negative expectations of interactions with mental health providers, financial barriers (e.g., lack of transportation and health insurance), less knowledge of information about how to access services, and a general cultural stigma against help-seeking due to historical abuses by U.S. researchers (Arcia, Fernandez, Marisela, Castillo, & Ruiz, 2004; Ayalon & Alvidrez, 2007; Tucker & Dixon, 2009). Once African Americans do receive mental health care, they are more likely to use short-term treatment (i.e., emergency

services) and have larger time gaps in between psychotherapy appointments, which makes them less likely to complete outpatient therapy (Chow et al., 2003; Hervey-Jumper et al., 2006). This has important implications as African American children with ADHD may not start treatment until symptoms are more severe, comorbidities have developed, and parents are more strained (Arnold et al., 1993; Tucker & Dixon, 2009).

Given these implications, research needs to further study parenting cognitions and behaviors of African American families in order to more accurately understand and fix their barriers to receiving evidence-based psychosocial treatment, which is largely parenting-based. As a significant limitation of the research literature to date has been the lack of specific studies assessing parenting an African American child with ADHD, much of the developing research on African American parents and interventions is grounded in theories developed using predominantly White parent and family samples. Thus, a discussion of those theories and foundational work in the parenting literature adapted for children with ADHD is critical in order to understand the need for African American adaptations.

Parenting African American children with ADHD. The available research on African American children with ADHD is limited. Therefore, research on parenting cognitions and behaviors in this population is conducted even more infrequently. As aforementioned, the literature to date has concentrated primarily on disparities in treatment utilization for African American populations (Bussing et al., 1998). Specifically, much of the extant literature has suggested that African American families prefer psychosocial over psychopharmacological interventions (Bussing et al., 2003). Additionally, research has often focused on the relationship between SES and race on parenting practices and subsequent child behaviors (e.g., Havighurst, 1976). For example, regardless of race or ethnicity, families that identify as low-income use

increased amounts of physical and psychological punishment and employ strategies that promote child obedience and a power differential between parent and child (Pinderhughes, Dodge, Bates, Pettit, & Zelli, 2000). Low-income African American families in particular use more intensive child monitoring strategies and unidirectional (parent to child) communication, which has been indicative of parental caring and investment in these families (Tamis-LeMonda, Briggs, McClowry, & Snow, 2008). Additionally, these parenting practices are associated with more positive outcomes for African American youth and may be influenced by African Americans' values of interdependence, conformity, and shared communal interests as compared to European Americans (McAdoo & Crawford, 1991). However, these practices and values have not been exclusively studied in African American parents of children with ADHD.

Large-scale treatment studies contain some of the limited knowledge of parenting among African American children with ADHD. The most notable was the NIMH-funded Multimodal Treatment of Attention Deficit Hyperactivity Disorder (MTA) study, which was designed to evaluate the frontline treatments for child ADHD (i.e., behavior therapy, medication, combined behavior therapy and medication, and a community control). Analyzing this data, Jones and colleagues (2010) found racial differences across many parent and child behaviors. Specifically, African American parents demonstrated use of behavior management strategies more frequently (e.g., in the context of high levels of child negative behavior, caregivers increased limits and decreased limits in response to appropriate child behavior) relative to White parents. Additionally, as compared to African American parents, White parents exhibited significantly higher levels of setting stage (e.g., parent prepares child for upcoming event by providing a summary of behavioral expectations for the child and what is generally to occur), warmth, and positive reinforcement (Jones et al., 2010). Though this study was one of the few to explore

specific racial differences in parenting a child with ADHD, more research examining specific parenting behaviors and strategies utilized among African American caregivers of children with ADHD is still needed.

Statement of Problem

Overall, the literature indicates that children with ADHD exhibit impairment in a variety of settings, including at home with their families. When a child with ADHD also has conduct problems, their impairment is often more significant and severely interferes with family functioning. As a result of the challenging behaviors these children exhibit at home, their parents tend undergo higher levels of parenting stress and subsequently utilize dysfunctional, ineffective parenting strategies that often increase their children's maladaptive behaviors. Given that conduct problems are noted to be more related to family conflict and parenting stress, over and above ADHD symptoms, and can be very costly to society if left untreated, understanding how to treat all families of children with ADHD and conduct problems is essential to improving the quality of life of these children and families.

Although a large amount of research has been devoted to children with ADHD and the functioning of their parents, very limited literature exists on African American children with ADHD. Moreover, even less is known about the functioning of African American children with ADHD and conduct problems and how their behaviors impact their parents' stress and behaviors (i.e., the strategies they utilize). The current study sought to understand the relationships among child comorbid conduct problems, parenting stress, and positive parenting in African American families of children with ADHD. Research has shown African American children with ADHD to have higher symptom severity, an elevated risk of developing conduct problems, and less treatment utilization than White children. Thus, it is important to understand the aforementioned

relationships in African American families so that, in the short term, children and parents' impairment can be decreased, and in the long term, mental health treatment barriers faced by African American families can be addressed and prevented.

Study Aims and Hypotheses

The current study was part of a larger study that examined differences in parenting among African American maternal caregivers of children with and without ADHD. Given the existing literature discussed, the current study had four primary aims.

Aim 1. This study sought to investigate whether child ADHD diagnostic status and child conduct problems predicted parenting stress in African American mothers of children with and without ADHD.

Hypothesis 1a. It was hypothesized that child ADHD diagnostic status would predict parenting stress in African American mothers.

Hypothesis 1b. It was hypothesized that child conduct problems would predict parenting stress in African American mothers.

Aim 2. This study aimed to explore whether child ADHD diagnostic status and child conduct problems predicted positive involvement and positive parenting in African American mothers.

Hypothesis 2a. It was hypothesized that child ADHD diagnostic status and child conduct problems would predict positive involvement in African American mothers.

Hypothesis 2b. It was hypothesized that child ADHD diagnostic status and child conduct problems would also predict positive parenting behaviors in African American mothers.

Aim 3. The third aim of this study was to explore whether child conduct problems moderated the relationship between the child's ADHD diagnostic status and parenting stress.

Aim 4. The final aim of this study was to explore whether child conduct problems moderated the relationship between the child's ADHD diagnostic status and parenting behaviors (i.e., involvement and positive parenting).

Method

Participants

Participants in this study included 76 African American mothers (*M* age= 35.69, *SD* = 6.60) and their children, who either had ADHD (*n*= 48, *M* age= 7.80, *SD*=1.35; ADHD group) or did not have ADHD *(n*= 28, *M* age= 7.59, *SD*=1.40; Comparison group or COMP). To investigate African American parenting, mothers were chosen as the focus because a majority of African American households are matriarchal (U.S. Census Bureau, 2012). Children and their mothers were included in the study if: 1) they both racially identified as African American; 2) lived in the same household; 3) children were between 6 and 10 years of age; 4) the children, based on a multi-method assessment (i.e., parent self-report, diagnostic interview, and teacher report), either met or did not meet DSM-IV criteria for ADHD; and 5) children had an estimated IQ of 70 or above. Children were considered ineligible for the study if they met DSM-IV diagnostic criteria for a bipolar disorder, a pervasive developmental disorder, psychotic disorder, chronic tic disorder, or had a medical history of a major neurological disorder. Since the study sampled solely African American children and their mothers, any inferences to the population were made specifically to interactions between African American mothers and children. Additional demographic information is included in Table 2.

Procedure

The current study was part of a larger study examining parenting differences and associated factors in African American mother-child dyads with and without ADHD. Recruitment methods included advertisements posted in primary care provider offices, local mental health clinics, and in community centers and organizations. Additionally, the study advertised in a free newspaper specifically targeting African Americans. There were two versions of the advertisements, and each version solicited African American mothers who were interested in participating in a research study. Mothers who expressed interest in participating completed a brief phone interview with research staff to assess for study eligibility. Once research staff determined that a mother-child dyad was eligible to participate in the study, the dyad was scheduled for a study visit. A study clinician first reviewed the procedures (e.g., purpose of the study, consent, compensation, etc.) with the mother-child dyad upon arrival to the research lab. All study participants provided parental consent and child assent. Once the explanation of study procedures was completed and consent and assent were obtained, the study clinician administered the Wechsler Abbreviated Scale of Intelligence – Second Edition (WASI-II; Wechsler, 2011) to the child in a separate testing room. While the child was in the testing room, mothers completed parent self-report questionnaires. Next, mothers were independently administered the diagnostic interview by a study clinician.

After completion of the diagnostic interview, structured parent-child interactions were conducted with the mother-child dyads. Once completed, all mother-child dyads received compensation for their time and effort (i.e., money and a small toy). Following the study visit, the child's teacher was contacted by a study clinician in order to explain the study and coordinate a time to meet with the teacher. At this meeting, study staff obtained teacher ratings of child

behavior and impairment. The study procedures were approved by the Virginia Commonwealth University Institutional Review Board.

Measures

Demographics. Mothers completed a demographic questionnaire that included information on maternal age, maternal education, marital status, child age, child grade, and child ADHD medication status.

Assessment of child ADHD and conduct problems. The Schedule for Affective Disorders and Schizophrenia for School Age Children – Present and Lifetime – DSM-IV Version (K-SADS-PL; Kaufman et al., 1997) is a semi-structured interview which assesses mental health disorders occurring within the past 12 months and any current episodes within a week prior to evaluation among children and adolescents. The K-SADS-PL assesses for DSM-IV disorders using the following modules: a) behavioral disorders, b) affective disorders, c) anxiety disorders, d) psychoses, and e) physical disorders. In this study, clinicians interviewed mothers using the K-SADS-PL to assess for a child diagnosis of ADHD and evaluate possible comorbid diagnoses, including symptoms of conduct problems. K-SADS-PL interviews were audiotaped, and all ADHD diagnoses (or lack thereof) were confirmed by another member of the study staff trained in KSADS-PL administration.

Conduct problems was transformed from a categorical variable (i.e., child meets DSM-5 diagnostic criteria vs. does not meet DSM-5 diagnostic criteria) into a dimensional variable. Specifically, the measure of conduct problems represented the number of symptoms meeting threshold level for both ODD and CD that the child's mother positively endorsed on the K-SADS interview. Examples of ODD symptoms included: loses temper, argues a lot with adults/authority figures, disobeys rules a lot, etc. Examples of CD symptoms include: lies, truant,

initiates physical fights, etc. Threshold level on the K-SADS indicated that for each individual symptom, the mother's description of the symptom was rated a 3 (from 0-3) by the clinician. Thus, syntax was created that counted the number of symptoms that mothers endorsed at threshold. The resulting measure will assess conduct problems on a dimensional scale, with higher scores indicating more threshold conduct problem symptoms endorsed by parent.

The ADHD-IV Rating Scale (DuPaul, Power, Anastopoulos, & Reid, 1998) was used to assess children's current symptoms and impairment associated with ADHD. Caregivers and teachers completed the scale with a study clinician. On this scale, caregivers and teachers were asked to rate DSM-IV symptoms of ADHD in the child by selecting the presence of their symptoms as either "very often," "often," "sometimes," or "never or rarely."

Lastly, the Impairment Rating Scale (IRS; Fabiano et al., 2006) was administered in order to assess caregiver perceptions of their child's functioning across multiple domains. Specifically, the IRS both quantitatively and qualitatively evaluates the impairment existing in a child's life, both in school (e.g., academic performance, classroom functioning, relationships with peers and teachers) and non-school settings (e.g., family functioning, relationships with peers, siblings, and parents). For this study, caregivers rated the severity of the child's impairment on a 7-point scale, ranging from 0 (*no problem/definitely does not need treatment*) to 6 (*extreme problem/definitely needs treatment*). The measure has convergent and divergent validity with other impairment scales and predictive validity in identifying children with ADHD diagnoses (Fabiano et al., 2006). The IRS also demonstrates good internal consistency.

Parenting Stress. The Parenting Stress Index – Short Form (PSI-SF; Abidin, 1995) is a 36-item self-report measure of stress in the parent-child relationship. The PSI-SF includes three subscales: Parental Distress (PD), Parent-Child Dysfunctional Interaction (P-CDI), and Difficult

Child (DC). The PD subscale assesses aspects related to distress of parenting, the P-CDI subscale assesses the parenting perception of a child, and the DC subscale assesses how much a parent feels their child is easy or difficult to manage. The PSI-SF produces subscale raw scores ranging from 20 to 60 and an overall total score ranging from 36 to 180, with higher scores indicating a greater level of stress. This measure requires caregivers to rate the degree to which they agree with a statement on a 5-point Likert scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). This measure has good internal consistency and satisfactory test-retest reliability. For the proposed study, the total parenting stress score was used to examine relationships between parenting stress, parenting practices, and child conduct problems in each group. Cronbach's alpha for the current sample was excellent (PSI Total $\alpha = .92$).

Parenting Behaviors. Maternal caregivers completed the Alabama Parenting Questionnaire (APQ; Shelton, Frick, & Wooton, 1996), a 42-item measure on which caregivers are asked to report the frequency with which they implement the following negative and positive parenting practices: Corporal Punishment, Inconsistent Discipline, Poor Monitoring/Supervision, Involvement, and Positive Parenting. Sums of items are generated for each of the five aforementioned parenting practices alone, as well as a total score for all items. Items are rated on a 5-point scale, ranging from 1 *(never)* to 5 *(always)*, with higher scores indicating more practices of that type of parenting. Reliability coefficients for internal consistency for all scales in children aged 6 to 13 years has been moderate to high (Shelton et al., 1996). Due to lower internal consistencies for Corporal Punishment, Inconsistent Discipline, and Poor Monitoring/Supervision subscales within our sample, the proposed study used the Involvement and Positive Parenting subscales to assess possible differences in self-reported parenting

practices among maternal caregivers of children with and without ADHD. The Cronbach's alphas for the current sample were good (Involvement α= .77; Positive Parenting α= .79).

Data Analytic Plan

Data Preparation. A post hoc power analysis was conducted using G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009) to determine the necessary sample size for the study. Previous meta-analyses on studies comparing groups on parenting stress (Theule et al., 2013) showed effect sizes to have been medium (K=5, f = 0.33, p<.001) for total stress when comparing mothers of children with ADHD to mothers of children with ADHD and clinical levels of comorbid conduct problems. In the present study, assuming a medium effect size, the total sample size should be 75 participants in order to detect an effect (power $\geq$ 0.8, alpha $\leq$ 0.05). Since this research study had already collected data, the actual number of participants (n= 78) exceeded the minimum sample. Thus, there should be sufficient power to detect a medium effect size. Additionally, an α-level of 0.05 was used for all statistical tests due to its conventional use as the maximum acceptable probability for determining statistical significance (Cowles & Davis, 1982), in addition to its use in previous qualitative and quantitative research supporting this study's hypotheses (Johnston & Mash, 2001; Theule et al., 2013).

In order to describe the sample as part of the preliminary analyses, means, standard deviations, and 95% confidence intervals were calculated for all continuous variables. For categorical variables, frequencies were assessed. To inform modification of analyses (i.e., transforming variables), normality of data was examined through analysis of skewness and kurtosis statistics. Specifically, if skewness statistics were found to be within the +1 and -1 range, the data was considered normal. Homogeneity of variance was assessed using the Levene's test. If the recommended significance value of .05 was not achieved while testing for

homogeneity of variance, the Welsh and Brown-Forsythe tests in the Robust Tests of Equality of Means were examined as recommended by Pallant (2007). Outliers were also examined for errors in data coding. If outliers were not attributable to data coding errors, they were modified to a less extreme but still high value according to recommendations outlined by Tabachnick and Fiddell (2007). To assess the normal linearity assumption, a scatterplot matrix between variables was generated. Finally, in order to test the assumption of multicollinearity, which if violated will overinflate the standard error and make some variables statistically insignificant, the correlation table and collinearity statistics were examined. Tolerance and VIF statistics were assessed. Predictor variables with correlations measured at .80 or greater were either included in the model, but centered around their means, or dropped from the model. This decision was based on recommendations by Tabachnick and Fiddell (2007).

Characteristics of the Sample. Means, standard deviations, and ranges for continuous demographic and criterion variables were calculated. For categorical demographic and criterion variables, percentages were reported. Independent t-tests were conducted to examine group differences on the continuous variables between ADHD and COMP. To assess basic group differences on categorical variables, chi-squared tests were computed. Pearson product-moment correlations were also calculated to examine relationships between ADHD diagnostic status, child conduct problems, parenting stress, and parenting behaviors (i.e., involvement and positive parenting). Any significant mean group differences on demographic variables (e.g., education level, maternal caregiver age) between the ADHD and COMP group were also calculated, reported, and controlled for in the main analyses.

Specific Aim Analyses. To address Aim 1 and 2 (i.e., examine factors that predict parenting stress and parenting behaviors), simultaneous multiple regressions were conducted.

Predictor variables of interest were entered simultaneously. Therefore, all predictor variables of interest were entered into the regression analyses to see which of these variables predict parenting stress and parenting behaviors. All primary analyses were also conducted with the original K-SADS ODD and CD diagnoses variables, measured categorically, to ensure the results did not differ based on how the conduct problems were measured.

To address Aim 3 and 4, three moderation models were tested using PROCESS (Model 1 in Hayes' SPSS macro) to explore if child conduct problems moderated the relationship between ADHD diagnostic status and parenting stress (Figure 1), parenting involvement (Figure 2), and lastly, positive parenting (Figure 3). Moderation analyses are used when the association between the predictor variable and criterion variable (DV) depends on a third variable. Specifically, a moderator variable alters the association (i.e., the direction or magnitude) between a predictor variable and criterion variable, by making the effect of the predictor variable(s) either stronger or weaker, in the presence of the moderator (Hayes, 2018). PROCESS utilizes a logistic regression-based path analytical or ordinary least squares framework to estimate two and three-way interactions in moderation models, simple slopes analyses, and regions of significance for examining the interactions.

First, categorical variables (i.e., ADHD diagnostic status) were dummy coded. Then the predictor variable, (ADHD diagnostic status) and the moderator (i.e., child conduct problems) were centered based on their respective grand means. This allows for the minimization of non-essential multicollinearity. The centered predictor variable (i.e., ADHD diagnostic status) and the centered moderator variable (i.e., child conduct problems) were entered in the first step. An interaction term was computed by the multiplication of ADHD diagnostic status and child conduct problems. This interaction term was entered into the second step. Unlike the normal

regression analysis of moderation where the interaction terms have to be computed by the analyst, the Hayes PROCESS automatically executes the computation, runs the analysis, and brings out the output, in addition to other practical advantages. If a product term was significant, it would mean that the association between the predictor variable (i.e., ADHD diagnostic status) and the criterion variables (i.e., parenting stress, positive parenting, and parenting involvement) are either stronger or weaker with the moderator (i.e., child conduct problems), depending on the direction of the relationship. The moderation effect (X*M) was tested using a bootstrap estimation approach with 1000 samples (Shrout & Bolger, 2002). The bootstrapping method was used to examine the significance of effects for independent variables (X, M, X*M) on outcome variable (Y). Such statistical significance was evaluated by computing a confidence interval around the effect estimate at the desired α level (e.g., 95% C.I.for α = .05, 99% C.I. for α = .01) using the bootstrapped sampling distribution. When the effect estimate does not include 0, that means the effect was significant.

Results

Preliminary Results

Initial data checking assessed the presence of normality, multivariate outliers and linearity. Normality of the data was assessed by examining skewness and kurtosis statistics. Data was considered normal if these skewness and kurtosis statistics were found to be within the range of +1 to -1. The Positive Parenting subscale of the APQ, Total Parenting Stress of the PSI, and Total Conduct Problems were found to be both skewed and kurtotic. Consistent with Kim (2015), the observed variables were not transformed, as linear regression analyses do not assume normality for either the predictor variables (IV) or the criterion variables (DV). Homogeneity of

variance of variables was assessed using the Levene's test. Results of Levene's test showed that data was homoscedastic. After reviewing scatterplots, the data were found to be linearly distributed. Consistent with Pallant (2007), significance for all tests was established at an alpha level of .05, two-tailed.

Histograms and scatterplots were generated for continuous variables in order to assess for outliers. Scatterplots displayed adequately linear relations between study variables. After examining histograms and scatterplots for the predictor and criterion variables, "mild" (i.e., greater than 1.5 interquartile range, less than 3.0 interquartile range) outliers were found for Positive Parenting, Positive Involvement, Total Parenting Stress, and Total Conduct Problems. "Extreme" (i.e., greater than 3.0 interquartile range) outliers were found for Total Conduct Problems. After further inspection, none of the outliers were accounted for by errors in coding nor by data missingness. However, given that the data contains both nonclinical and clinical participants, violations of the normality and homoscedacity assumptions are to be expected (Sawilowsky & Blair, 1992). The parametric tests used in analyses (e.g., independent t-tests, linear regression) are robust to these violations, and bootstrapping will be used with the moderation analyses to obtain a better estimation of the sampling distribution. Thus, outlying data points were retained for analyses.

Missing data. Preliminary item-level analysis of missing data values indicated that missing data were minimal (0.0-2.6%) across dependent and moderator variables of interest. Little MCAR's test demonstrated they were missing completely at random (MCAR), χ^2 (106.17) = 86, p = .069. Although there is no established cutoff, missing rates of 5% or less tend to be inconsequential and 10% or less unbiased (Dong & Peng, 2013). Thus, analyses proceeded as planned.

Between-Group Differences. To verify group un-equivalence, independent t-tests were conducted to examine group differences on the continuous variables of interest between ADHD and COMP. Results indicated that mothers in the ADHD group reported significantly higher parenting stress (M=86.89, SD=29.77) than mothers in the COMP group (M=66.82, SD=17.69), t (71.98) = 3.73, $p < .001$. Additionally, mothers in the ADHD group reported that their children had significantly more conduct problems (M=2.04, SD=3.16) than children in the COMP group (M= 0.24, SD= 0.69), t (71.98) = 3.73, $p < .001$. No other mean differences were found. Mean comparisons are reported in Table 2.

To assess basic group differences on categorical variables of interest, chi-squared tests of independence and goodness of fit were computed. The relation between group membership (i.e., ADHD or COMP) and child ADHD medication status was significant, χ^2 (2, N = 78) = 12.87, $p <$ .001, such that at the time of assessment, children in the ADHD group were more likely to be taking ADHD medication compared to children in the COMP group. No other mean differences between groups were detected. However, to remain consistent with the ADHD literature, analyses were re-run with maternal education, included as a control variable. Results did not differ significantly ($p > .05$) upon including maternal education in analyses; thus, all analyses are presented with ADHD medication status as a control variable and do not include maternal education. Mean comparisons are reported in Table 2.

Within-group correlation analyses. Correlation analyses between all continuous variables of interest were conducted within ADHD and COMP groups. For the mothers of children without ADHD, there was a significant positive association between positive parenting and parent involvement, r (29) =.682, $p < .001$; there was also a significant negative association between parenting stress and parent involvement, r (28) = -.527, p = .004. For the mothers of

children with ADHD, there was significant positive association between parenting stress and child conduct problems, r (49) =.330, p =.025. Additionally, for the ADHD group, positive parenting was positively correlated with parent involvement, r (48) = .680, p < .001. See Table 3 for correlation analyses.

Primary Results

Regression Analyses. Regression analyses were conducted to determine whether or not the predictor variables of interest (i.e., child ADHD diagnostic status, and conduct problems), after controlling for baseline group demographic differences (i.e., ADHD medication), predicted parenting stress (Hypothesis 1), positive parenting (Hypothesis 2a), and involvement (Hypothesis 2b). Overall, six separate models were conducted, three separate models with child ADHD as the independent variable predicting the dependent variables: parenting stress, positive parenting, and involvement. Three models included conduct problems as the independent variable predicting the dependent variables: parenting stress, positive parenting, and involvement. For each model, child ADHD medication was controlled, through its addition in the second step of the model. Lastly, after re-running analyses with conduct problems measured categorically, it did not significantly predict any of the dependent variables of interest.

To test hypothesis 1a, when child ADHD diagnostic status was entered, it significantly predicted parenting stress, F (1, 73) = 10.97, p =.001, R^2 = .132. As indicated by R^2, 13.2% of the variance in parenting stress could be predicted by knowing the child's ADHD diagnosis alone. When ADHD medication status was added to the model in step two, it did not significantly improve the prediction and accounted for 1.2% more of the variance in parenting stress, beyond the variance accounted for by child ADHD diagnostic status, ΔR^2 = .012, ΔF (1, 71) = 1.03, p=.315. All variables together significantly predicted parenting stress, F (2, 73) = 5.99, p = .004,

R^2 = .145. Based on these results, I reject the null hypothesis and infer that the ADHD diagnostic status accounts for significant variability in parenting stress, even when accounting for child ADHD medication status in the population. See Table 4 for regression analyses.

To test hypothesis 1b, when conduct problems was entered, it significantly predicted parenting stress, F (1, 73) = 12.139, p =.001, R^2 = .144. As indicated by R^2, 14.4% of the variance in parenting stress could be predicted by knowing the child's level of conduct problems. When ADHD medication status was added to the model in step two, it did not significantly improve the prediction and accounted for 1.6% more of the variance in parenting stress, beyond the variance accounted for by maternal highest level of education, ΔR^2 = .016, ΔF (1, 71) = 1.34, p =.250. All variables together significantly predicted parenting stress, F (2, 73) = 6.77, p =.002, R^2 = .16. Based on these results, I reject the null hypothesis and infer that conduct problems accounts for significant variability in parenting stress, even after controlling for child ADHD medication status in the population.

To test hypothesis 2a, when child ADHD diagnostic status was entered, it did not significantly predict positive involvement, F (1, 76) = .277, p = .60, R^2 = .004. As indicated by R^2, 0.4% of the variance in positive involvement could be predicted by knowing the child's ADHD diagnosis. When ADHD medication status was added to the model in step two, it did not significantly improve the prediction and accounted for 0.7% more of the variance in positive involvement, beyond the variance accounted for by child ADHD diagnostic status, ΔR^2 = .007, ΔF (1, 74) = .489, p=.487. All variables together did not significantly predict positive involvement, F (2, 76) = .382, p =.68, R^2 = .010. Based on these results, I fail to reject the null hypothesis and do not have evidence to suggest that ADHD diagnostic status accounts for

significant variability in positive involvement, both before and after accounting for child ADHD medication status in the population.

To further test hypothesis 2a, another model was conducted; when conduct problems was entered into the model first, it did not significantly predict positive involvement, F (1, 76) = 2.48, p =.119, R^2 = .032. As indicated by R^2, 3.2% of the variance in positive involvement could be predicted by knowing the child's level of conduct problems. When ADHD medication status was added to the model in step two, it did not significantly improve the prediction and accounted for 1.1% more of the variance in positive involvement, beyond the variance accounted for by ADHD medication status, ΔR^2 = .011, ΔF (1, 74) = .848, p =.360. All variables together did not significantly predict positive involvement, F (2, 76) = 1.66, p =.196, R^2 = .043. Based on these results, I fail to reject the null hypothesis and infer that conduct problems does not account for significant variability in positive involvement, both before and after controlling for child ADHD medication status in the population.

To test hypothesis 2b, when child ADHD diagnostic status was entered into the model, it did not significantly predict positive parenting, F (1, 76) = .030, p =.863, R^2 = .000. As indicated by R^2, 0.04% of the variance in positive parenting could be predicted by knowing the child's ADHD diagnosis. When ADHD medication status was added to the model in step two, it did not significantly improve the prediction and accounted for .2% more of the variance in positive parenting, beyond the variance accounted for by child ADHD diagnostic status, ΔR^2 = .002, ΔF (1, 74) = .126, p=.724. All variables together did not significantly predict positive parenting, F (2, 76) = .078, p = .925, R^2 = .002. Based on these results, I fail to reject the null hypothesis and do not have evidence to suggest that ADHD diagnostic status accounts for significant variability

in positive parenting, both before and after accounting for child ADHD medication status in the population.

To further test hypothesis 2b, when conduct problems was entered, it did not significantly predict positive parenting, F (1, 76) = .069, p =.793, R^2 = .001. As indicated by $R^{2,}$,0.1% of the variance in positive parenting could be predicted by knowing the child's level of conduct problems. When ADHD medication status was added to the model in step two, it did not significantly improve the prediction and accounted for 0.2% more of the variance in positive parenting, beyond the variance accounted for by ADHD medication status, ΔR^2 = .002, ΔF (1, 74) = 1.34, p =.733. All variables together did not significantly predict positive parenting, F (2, 76) = .093, p =.911, R^2 = .003. Based on these results, I fail to reject the null hypothesis and infer that conduct problems do not account for significant variability in positive parenting, both before and after controlling for child ADHD medication status in the population.

Moderation Analyses. To address Aim 4, one moderation model was conducted using PROCESS (Model 1 in Hayes' SPSS macro) to explore if child conduct problems moderate the relationship between ADHD diagnostic status and parenting stress (Figure 1). Given that there were no significant findings for involvement and positive parenting (Hypothesis 2a and 2b), I did not run the two moderation models for involvement (Figure 2), and positive parenting (Figure 3).

To test the hypothesis that child conduct problems moderates the relationship between child ADHD diagnostic status and parenting stress, the bootstrapping method was used to examine the significance of effects for independent variables (ADHD diagnostic status, child conduct problems, and the interaction between ADHD diagnostic status and child conduct problems) on outcome variable (parenting stress). I found no evidence for a moderating effect of child conduct problems on the relationship between ADHD diagnostic status and parenting stress

to reach statistical significance (b = 1.44, SE = 7.07, p = .858. The bias-corrected 95% confidence interval was [-12.85, 15.39]. Overall, since the effect estimate included 0, I infer that there is no significant moderation of child conduct problems relationship between ADHD diagnostic status and parenting stress in the population.

Discussion

This study aimed to investigate relationships among child ADHD, child conduct problems, parenting stress, and parenting behaviors (i.e., involvement and positive parenting) in African American families of children with and without ADHD. Further, the impact of child conduct problems on the relationship between child ADHD and parenting stress and behaviors was explored. Overall, child ADHD and conduct problems significantly predicted parenting stress. However, neither variable significantly predicted parenting involvement nor positive parenting. Additionally, child conduct problems were not found to moderate the relationship between child ADHD and parenting stress. These results indicated that African American mothers felt increased stress in their parenting role when their child either had a diagnosis of ADHD or exhibited conduct problems. However, in this sample, a child's conduct problems did not strengthen or weaken the relationship between a child's ADHD diagnosis and their mother's parenting stress.

Before running main analyses to test the hypotheses, differences between the ADHD group and COMP group were conducted to ensure key demographic variables were equivalent across groups. The groups significantly differed on one variable: the percentage of children currently taking medication for the treatment of ADHD. Thus, children diagnosed with ADHD were more likely to be taking ADHD medication than children who were not diagnosed with

ADHD. Given that an ADHD diagnosis is required before prescription of stimulant medication for children ages six to ten (Subcommittee on ADHD, 2011), this difference is to be expected. However, when comparing my sample to parent-reported national averages, 34.7 percent of children in the study's ADHD group were taking medication; whereas, the 2014 National Survey of the Diagnosis and Treatment of ADHD and Tourette syndrome indicated that 73.3 percent of children diagnosed with ADHD reported taking medication (Visser, Blumberg, Danielson, Bitsko, & Kogan, 2013). Unfortunately, Visser and colleague's (2013) sample did not include data on medication usage categorized by race/ethnicity. They instead calculated weighted approximations by state and sex-stratified age. Thus, when looking at larger national averages it appears that my sample had lower medication usage.

However, when comparing my sample to other national averages that assessed race, the medication usages in my sample still seem to be lower. For example, using the 2016 National Survey of Children's Health (NSCH), Danielson and colleagues (2018) calculated estimates of the U.S. national prevalence of parent-reported ADHD diagnosis and treatment for their children aged two to seventeen years old. Based on the NSCH, approximately 61.9 percent, CI [53.2, 70.0], of non-Hispanic Black children diagnosed with ADHD were taking medication, as compared to the 34.7 percent of African American children in my study sample. One explanation for the discrepancy could be the age difference between my study and the national study sample. Specifically, the NSCH surveyed youth ages 2 through 17 and found that the age at which the highest percentage of children with ADHD were taking medication was 11 years old (Danielson et al., 2018). The mean age for the ADHD group in my sample was 7.76 (*SD*=1.35). Thus, although the NSCH had a high percentage of school-age youth (6-11 years old) taking medication (68.6%, PR = 3.76, 1.5 million), age by race analysis was not conducted, so it is

difficult to ascertain if African American children began taking medication at older ages than other youth.

Although much lower than the national estimates, the medication use in my sample is generally aligned with literature on stimulant medication use for African American children, which demonstrates that African American youth, especially those receiving Medicaid, have lower medication utilization, adherence, and persistence than White youth (Cummings, Ji, Allen, Lally, & Druss, 2017; Marcus, Wan, Kemner, & Olfson, 2005; Morgan, Staff, Hillemeier, Farkas, & Maczuga, 2013; Saloner, Fullerton, McGuire, 2013). This difference in medication usage further highlights that African American children tend to experience a lower quality of mental health care or barriers to evidence based treatment. Overall, without combined treatment (i.e., stimulant medication and behavioral therapy), behaviors related to ADHD tend to be more difficult to manage (Pelham & Fabiano, 2008; Subcommittee on ADHD, 2011).

Correlations between all variables of interest were assessed in preliminary analyses and the findings were consistent with literature. In both the ADHD and COMP group, mothers who reported implementing positive parenting strategies (e.g., praising their child when he/she did something well) also endorsed items indicating they were more actively involved with parenting (e.g., driving their child to special activities). This positive correlation has been demonstrated extensively in the parenting literature when assessing children with and without ADHD and in White and African American samples (Elmore & Gaylord-Harden, 2012; Essau et al., 2006; Gaylord-Harden, Elmore, & Montes de Oca, 2013; Hawes, Dadds, Frost, & Russell, 2013). The relationship has been displayed so frequently that some studies have combined the positive parenting and parental involvement subscale of the APQ into one construct of parental warmth/ positive parenting (Elmore & Gaylord-Harden, 2012; Gaylord-Harden et al., 2013; Haack et al.,

2016). This is the first study, to the author's knowledge, that has shown this correlation in African American families of children with ADHD.

Additional correlations between variables of interest displayed results consistent with the literature. For example, in the COMP group, parenting stress negatively correlated with parental involvement, which is congruent with studies that have indicated that, even in families of children without ADHD, as a parent experiences more stress in their parenting role, they report being less warm and engaging in fewer positive activities with their child (Giallo, Treyvaud, Cooklin, & Wade, 2013; Grolnick, Benjet, Kurowski, Apostoleris, 1997; Semke, Garbacz, Kwon, Sheridan, & Woods, 2010). In the ADHD group, parenting stress and child conduct problems were positively correlated. Numerous studies on parenting stress and conduct problems in White youth with ADHD suggest that child conduct problems, over and above ADHD, contribute to increased parenting stress for mothers (Chronis et al., 2007; Deault, 2010; Theule et al., 2013). However, these constructs have not been studied previously in African American children with ADHD. Given that African American caregivers report having greater burden and subsequent health concerns than caregivers of other racial/ethnic groups, this finding shows that if African American families have children with additional conduct problems, their stress may also be more increased. Ultimately, this could have negative consequences both for parents' health and for their children's academic, legal, and social outcomes.

In the current study, ADHD diagnostic status was a significant predictor of parenting stress, even when accounting for child ADHD medication status, which is consistent with previous study findings using majority White samples. For example, in their meta-analysis comparing parenting stress across parents of children with ADHD, parents of children with co-occurring conduct problems, and parents of nonclinical controls, Theule and colleagues (2013)

found that parents of children with ADHD experience significantly more parenting stress than parents of children without ADHD. The effect size of this relationship was large (K=5, d = 1.80, p<.001; Theule et al., 2013). This predictive and bidirectional relationship between child ADHD and parenting stress has been found in several studies, particularly with mothers (Gerdes et al., 2012; Gordon & Hinshaw, 2017; Harrison & Sofronoff, 2002; Miranda, Grau, Rosel, & Melí, 2009; Sollie, Mørch, & Larsson, 2016). Additionally, the developmental literature on parenting stress in African American mothers is consistent with my finding that African American mothers experience very high levels of parenting stress. For example, studies have shown that as result of structural disadvantages (e.g., single motherhood, lower family income, more children; Aud, Fox, & Kewal Ramani, 2010; Hummer & Hamilton, 2010) experienced by many African American mothers in the United States, they tend to report more parenting stress than parents of other racial groups; this gap increases as children get older (Nomaguchi & House, 2013). For African American mothers who live in low-income communities, strong associations have been found between parenting stress and child externalizing problems, single parenthood, low levels of involvement and cohesion, poor physical health, and youth age (Anderson, 2008). In my sample, these structural disadvantages were present as a majority of mothers were single, with an average of three children living at home, and half of mothers had a high school degree as their highest level of education. However, in addition to these structural disadvantages, many of the mothers in my sample had a child with ADHD, which was shown to increase their baseline parenting stress even further.

In addition to ADHD diagnostic status, the current study found that conduct problems were a significant predictor of parenting stress, even after controlling for child ADHD medication status. This finding is consistent with the clinical literature, which shows that conduct

problems are very stressful for parents, over and above the symptoms of ADHD (Theule et al., 2013). The effect size of this relationship is large (K=5, d=.66, p<.001; Theule et al., 2013). In general, when conduct problems occur with ADHD, research shows an increase in family conflict and parental psychopathology, poorer educational outcomes for the child, more overall family stress, and importantly, increased levels of parenting stress (Connor et al., 2010; Pfiffner, McBurnett, & Rathouz, 2005). Further, there is well-established research that conduct problems in children without ADHD are predictive of parenting stress, and the relationship is often transactional (Anjum & Malik, 2010; Puff & Renk, 2014; Solem, Christopherson, & Martinussen, 2011; Stone, Mares, Otten, Engels, & Janssens, 2016). Specifically, evidence showed that behavioral problems were related to parenting stress longitudinally over the course of three years (Stone et al. 2016). Further, this relationship is so strong, such that one study showed child behavioral problems to account for 57% of the variance in parenting stress (Solem et al., 2011). Notably, the developmental literature on African American mothers of children in typically developing children has demonstrated that youth conduct and/or behavior problems are positively related to parenting stress (BeLue, Halgunseth, Abiero, Bediako, 2015; Simons et al., 2016). However, most studies with African American mothers demonstrate that parenting stress predicts child conduct problems (BeLue et al., 2015; Hinojosa et al., 2012), and fewer indicate that these relationships are transactional (Bradley & Corywn, 2015; Pardini, Fite, & Burke, 2008). Given this, my study finding adds to both the ADHD and Black parenting literature, as it provides some evidence that for Black mothers of children with ADHD, greater child conduct problems were associated with increased stress in their parenting role.

Contrary to my hypotheses, neither child ADHD diagnostic status nor conduct problems predicted positive parent involvement and positive parenting behaviors for African American

mothers. In general, this finding contradicts the parenting literature for children with ADHD using majority White samples. Parent involvement, measured with different instruments, has been negatively associated with ADHD symptomatology and child behavior problems (Rogers et al., 2009; Semke et al., 2010). Overall, parents of children with ADHD often implement negative, ineffective parenting strategies that are associated with severity of ADHD symptoms and child behavior problems (Chronis et al., 2007; Johnston & Mash, 2001; Johnston, 1996; Wiener et al., 2013). Studies using the APQ have shown that mothers of children with ADHD tend to report less involvement (Gerdes et al., 2012; Gryczkowski, Jordan, Mercer, 2018), and that lower levels of conduct problems (i.e., aggression) have been associated with more maternal positive parenting (Gaylord-Harden et al., 2013; Kaiser et al., 2010). Further analysis of means of the positive parenting and involvement scales indicated that the mothers in my study reported relatively similar means for involvement (M= 41.27) and positive parenting (M= 26.92) as compared to mothers in previous studies. For example, the means of other studies measuring parent involvement (Gerdes et al., 2012, M=38.70; Gryczkowski et al., 2018, M=40.44; Benedetto & Ingrassia, 2012, M=38.53) and positive parenting (Gerdes et al., 2012, M= 24.95; Gryczkowski et al, 2018, M=24.76; Benedetto & Ingrassia, 2012, M=25.77) were very similar to the mothers in my study. Further, many studies (e.g., Gaylord-Harden et al., 2013) created a combined score for maternal support that consisted of parent involvement and positive parenting; however, Gaylord-Harden's composite score (M= 61.76, SD= 8.39), was lower than the composite score mean in the current study, (M= 68.19, SD= 7.75). Other cited studies (i.e., Kaiser et al., 2010) did not include their APQ subscale means. Thus, overall, it seems that my sample had similar levels of positive parenting and involvement compared to mothers of school-aged children with ADHD and/or conduct problems.

Additionally, when analyzing the spread of the two APQ subscales in my dataset, my standard deviations also seemed to match the studies of using the APQ for children with ADHD and/or conduct problems. For example, my standard deviation for positive parenting (*SD*=3.12) was very similar to the standard deviations in other studies (e.g., Benedetto & Ingrassia, 2012, *SD*=2.66; Gerdes et al., 2012, *SD*=3.47; Gryczkowski et al., 2018, *SD*=2.89). Similarly, my spread of the data for positive involvement (*SD*=5.28) was also pretty equivalent to the standard deviation of other studies (e.g., Benedetto & Ingrassia, 2012; *SD*=5.78; Gerdes et al., 2012; *SD*=4.64; Gryczkowski et al., 2018, *SD*= 4.42). Thus, despite this null finding, when describing their parenting practices, the current study sample of mothers statistically performed similarly to other samples of mothers of children with ADHD.

An additional explanation of my null finding could be that for African American mothers, having a child with ADHD and conduct problems does not theoretically predict their positive parenting and parenting involvement. Specifically, African American parents may give consistent levels of positive parenting and parenting involvement regardless of their child's exhibits externalizing problems. This seemed to be consistent with my sample, as the means for involvement between the ADHD group (41.27) and COMP group (41.93) and for positive parenting between the ADHD (26.92) and the COMP group (26.79) were not statistically different. A brief examination of the developmental literature would indicate that, for some African American mothers, inconsistent discipline has been related to externalizing behavior across genders. Specifically, positive parenting has been associated significantly with sons and poor monitoring with girls (Hill & Bush, 2004; Rodriguez, McKay, & Bannon, 2008). Additionally, many African American mothers reported engaging in relatively high levels of both parental warmth (which includes positive parenting) and control (Elmore & Gaylord-

Harden, 2012). An additional variable, parenting efficacy, has been demonstrated to be positively correlated with positive parenting practices and protective against child psychopathology (Elder, Eccles, Ardelt, & Lord, 1995; Hill & Bush, 2004). Although not measured in the current study, it is plausible that given this association, African American mothers may feel highly efficacious in their parenting role; thus, this coupled with their high amount of warmth and control for their children may prevent child psychopathology from disrupting their parenting practices.

Further, a third variable, not captured by this study's methodology, could be explaining the lack of relationship between the APQ subscales and externalizing behavior. Extant literature on African American parenting has examined the impact of culturally relevant parenting practices in tandem with more "universal" parenting practices (i.e., monitoring, consistency and effectiveness of discipline; Rodriguez et al., 2008). For example, specific to African American families, goals around racial socialization and ethnic racial identity are associated with various parenting practices and strategies that are targeted in behavior training programs (Coard, Wallace, Stevenson, & Brotman, 2004; Hill & Tyson, 2008). Research has indicated that when African American parents ineffectively cope with discrimination, their children have higher levels of disruptive behavior (Caughy, O'Campo, & Muntaner, 2004; Coard et al., 2004). Further, stronger ethnic identity and racial centrality of African American parents and other ethnic minority parents (i.e., Latinx and Asian parents) has been associated with reduced disruptive behavior and externalizing problems in their children (Calzada, Brotman, Huang, Bat-Chava, & Kingston, 2009). Cultural values around respect for authority, obedience, and independence are associated with parenting practices like communal child rearing through strict discipline and extended family and church networks; as such, parental religious beliefs have also been predictive of parenting practices for African American mothers (Forehand & Kotchick,

2016). Since research has explicated that "universal' and culturally specific parenting styles work together to lessen child behavior problems in African American families (Rodriguez et al., 2008), it's plausible that these culturally specific parenting variables could be explaining, enhancing, buffering, or antagonizing the relationship between child externalizing behavior problems and positive parenting and involvement in my study's sample.

Furthermore, there have been theories and subsequent studies that have supported the bidirectional association of parenting and behavior problems. Namely, the coercion theory developed by Patterson (1982), explicates that parent-child interaction are a process of mutual reinforcement wherein children exhibit difficult behaviors or react with resistance or anger to a caregiver's request. This leads parents to inadvertently reinforce these behaviors and prompts caregivers to react negatively; interaction continues until either the child or caregiver gives up and there is a "winner" (Patterson, 1982; Smith et al., 2014). Thus, following this theoretical understanding of parent-child interactions, some research has shown a reciprocal, bidirectional association between that maladaptive behavior (e.g., conduct problems) and negative parenting behaviors (e.g., negative parent involvement, more harsh parental control and monitoring, and inconsistent and ineffective parenting; Dishion & Patterson 2006; Gershoff et al., 2013; Williams & Steinberg, 2011). Additionally, Pinquart (2017) recently conducted a meta-analysis of 1,435 studies that provided evidence for this bidirectional relationship; specifically, externalizing problems predicted warmth, harsh and psychological control, and authoritative parenting.

However, there have been few studies exclusively analyzing African American families that show child externalizing problems to predict parenting behaviors. Namely, Bradley and Corywn (2015)'s study showed evidence suggesting that child externalizing behavior influences

parenting (i.e., maternal sensitivity, parental harshness, and productive activity) more than the alternative from middle childhood onward. One developmental study demonstrated this bidirectional relationship in African American boys such that the impact of conduct problems on changes in parenting behaviors was just as robust as the influence of parenting behaviors on development of conduct problems over time (Pardini et al., 2008). In regards to positive parenting in African American families, research has shown that supportive parenting (measured as the composite of positive parenting and involvement from the APQ) was related to fewer maladaptive child behaviors (Elmore & Gaylord-Harden, 2012). Further, in examinations of parenting dimensions in African American mothers, Frabutt, Walker, and MacKinnon-Lewis (2002) found that positive involvement and increased monitoring were positively associated with more prosocial, positive child behaviors. Finally, parental warmth and positive parenting were shown to predict low levels of child externalizing behavior four years later in African American children; this relationship was mediated by an emotion regulatory mechanism: effortful control (Eisenburg et al., 2005). However, in all but Pardini's (2008) study, externalizing behavior was not demonstrated to be a predictor of positive parenting or involvement, in both cross-sectional and longitudinal studies, for African American families. Thus, although, there appears to be developing evidence, it seems that more research is needed to support unidirectional relationship between impact of child behavior on parenting in African American families. Ultimately, my null finding, that child externalizing problems (i.e., ADHD and child conduct problems) did not predict parenting stress seems to be congruent with extant literature.

Lastly, child conduct problems did not moderate the relationship between child ADHD diagnostic status and parenting stress. This finding was surprising as there is research that shows child conduct problems may strengthen the relationship between child ADHD and parenting

stress (Barkley et al., 1992; Deault, 2010; Theule et al., 2013). In general, studies have shown conduct problems, more than ADHD symptoms, to be associated with increased family conflict and a host of other parental distress variables (i.e., parenting stress, maternal psychopathology, substance dependence, etc.; Chronis et al., 2007; Deault, 2010). Given this literature, it would seem that child conduct problems may impact the direction of the relationship between ADHD and parenting stress. However, one reason for this null finding may be the lack of variability in parent-reported child conduct problems in my sample of African American mothers. Specifically, 76.9% (*n*=60) of my total sample (*n*=78) endorsed that their child exhibited zero or one symptoms of conduct problems. This finding, particularly for African American families, is surprising as the CDC Mental Health Surveillance Among Children—2005-2011 survey found that Black, non-Hispanic parents had the highest report of current behavioral or conduct problems for their children, endorsed at 6% as compared to 3.2% for Hispanic children and 3.0% for White, non-Hispanic children (Perou et al., 2013). However, when looking at the age breakdown of current behavioral or conduct problems, parents endorsed 1.3% of their young children (3 to 5-year-olds), 3.8% of their school aged youth (6 to 11-year-olds), and 4.2% of their teenage youth (12 to 17-year-olds) as having these problems. Conversely, my sample was young (*M* age= 7.76, *SD*= 1.38), and parents endorsed that 2.3% of children had current conduct problems. However, the CDC survey did not stratify their sample by both age and race and did not specify if the children had ADHD, so it is not possible to determine the exact percentage of school-aged African American children who were currently experiencing behavioral or conduct problems, which limits the comparisons I can make of my sample to the national averages. Overall, it seems that the current study's homogenous amount of conduct problems could

potentially contribute to a lack of findings of child conduct problems as a moderator of the relationship between parenting stress and child ADHD diagnostic status.

Limitations

Although the study findings add knowledge to the literature base for African American mothers of children with and without ADHD, there are several limitations that should be discussed. As aforementioned, one of the main limitations was the low level of conduct problems in the sample and the general lack of variability in the conduct problems score. Before transforming conduct problems from a categorical variable into a dimensional variable, in the ADHD group, 28.6 percent of children were diagnosed with ODD and 4.1 percent were diagnosed with CD. This is incongruent with national U.S. averages, which show that approximately 60% of children with ADHD experience co-occurring ODD and approximately 20% experience co-occurring CD (Biederman, 2005; Connor et al., 2010). Further, the age-of-onset of CD has a median of 11.6 (0.2) years old (Nock, Kazdin, Hiripi, & Kessler, 2006) and parenting involvement has been demonstrated to be most predictive of conduct problems in an adolescent age group (ages 13 to 17), when compared to 6 to 8-year-olds and 9 to 12-year-olds (Frick, Christian, & Wooton, 1999). Thus, since older youth tend to have higher occurrences of conduct problems, particularly CD, it could be that if my sample was older, I would have seen more variability in diagnoses. Thus, this may limit the generalizability of my findings, since it seems that the children in my study had lower levels of conduct problems, which may have also contributed to some of my null findings in regards to parenting behaviors and parenting stress.

A second limitation of the study involved the measurement of conduct problems. For example, sole inclusion of semi-structured interviews to diagnose ADHD and conduct problems makes the diagnostic assessment less robust. Further, in order for a gold-standard of

measurement of child conduct problems, integration of multi-method (e.g., clinical interview, behavioral questionnaires, and naturalistic observation) and multi-informant (e.g., teacher, parent self-reports) is recommended (DiBartlo & Grills, 2006; McLeod, Jensen-Doss, & Ollendick, 2013; McMahon & Frick, 2010). Thus, my primary use of semi-structured interviews to measure symptom counts for conduct problems is a limitation. Additionally, the majority of the measures were self-report; thus, method variance can overstate the correlations among measures and limit the practical application of the independently assessed variables (Kazdin, 2016; Meyer et al., 2001). When this occurs, it is harder to assert that high correlations among measures reflect true construct variance, as they could instead represent method variance or method bias; therefore, the construct validity of the data could be questioned (Kazdin, 2016; Meyer et al., 2001). Since the study was based on secondary data analysis, it was difficult to avoid the substantial use of self-report in the study.

A third limitation to the study involved cultural implications. Although parenting and child constructs that could impact African American families' behavioral parent treatment adherence and success are investigated in the current study, the cultural validity could be improved. Following recommendations made by Okazaki and Sue (1995), cultural norms need to be considered during the selection of the measurement. Some measures of the constructs (i.e., parenting behaviors) did not have much validity data for solely Black/African American populations, with most of the large-scale validity and normative data studies sampling majority White (e.g., Shelton et al., 1996), non-American (e.g., Dadds et al., 2003), or samples using translations (e.g., Essau et al., 2006; Haack et al., 2012). Kazdin (2016) argues that without supportive data within a study, a given measure cannot be assumed to be metrically or conceptually equivalent for different cultures. Further, Okazaki & Sue (1995) argue that more

extensive descriptive demographic data (e.g., acculturation, generational status, racial/ethnic identity, neighborhood composition) is necessary when studying ethnic/minority populations. These demographics may be of particular importance when discussing parenting as many researchers have posited that different child rearing styles and behaviors are necessary given the context (i.e., cultural background) of which the family is embedded (Murray, Brody, Willert, & Stephens, 2001). For African American mothers in particular, there are several contextual variables (i.e., SES, education, historical events, discrimination, racial socialization of children) that may contribute to the impact of parenting styles on their child's behavior (Darling & Steinberg, 1993; McAdoo, 2002; Pearl et al., 2014). Due to potential cultural differences, much parenting research has focused on the impact that these social and cultural characteristics may have on parenting techniques. Overall, since the current study did not utilize some potentially important cultural variables and did not use a parenting measure with extensive validity information for Black mothers, the description of the diversity and any potential underlying cultural processes that could serve as moderators of the potential findings on parenting is limited.

A fourth limitation of the study was its cross-sectional design. Although generation of theory is a strength of cross-sectional, case-control designs due to their correlational nature, one limitation of these designs is that a causal relation cannot be determined; whereas in longitudinal designs, causality can be more easily hypothesized (Kazdin, 2016). Thus, in the current study, it could in fact be that parents who are more stressed may perceive their child's behavior as worse than the behavior is objectively; therefore, it would be difficult to determine if conduct problems are causing parenting stress or if stress is causing conduct problems. This limitation is of particular importance to the current study's variables of interest, for many researchers argue that externalizing problems and parenting behaviors operate in a bidirectional, transactional fashion

(Pardini et al., 2008; Pearl et al., 2014; Stone et al., 2016). Therefore, the current study cannot truly make inferences regarding causality and cannot account for potential third variables that may be driving the relationship between externalizing problems (i.e., child conduct problems and ADHD diagnosis) and parenting stress and behaviors.

Future Directions

Overall, both child ADHD and conduct problems predicted parenting stress in African American mothers. However, they did not predict positive involvement or positive parenting, and conduct problems did not moderate the relationship between child ADHD and parenting stress. These findings have important research implications for African American mothers of children with ADHD. First, future research and intervention with African American mothers of children with ADHD should also assess the multiple potential risk factors for increased parenting stress (e.g., maternal depression, anxiety, and/or ADHD, substance use, child internalizing symptomatology) to help more clearly identify moderators and/or mediators of the relationship between child ADHD and parenting stress. Further, researchers should consider studying these relationships longitudinally with a larger sample in order to ensure adequate power and allow for inferences regarding the temporal order of child conduct problems and parenting stress. By studying these relationships longitudinally, true insight into potential risk and protective factors for African American children's development could be uncovered (Kazdin, 2016). Additionally, researchers should investigate whether African American families are more engaged in treatment if parenting stress is a focus of intervention. Some research has shown that parenting stress is associated with high levels of readiness to change (Jones et al., 2017). Given this, treatment research should directly study this protective factor. Further there has been some evidence showing efficacy for parent training with added parenting stress components (Kazdin & Whitley,

2003); however, these studies have predominantly included White families. Thus, randomized control trials comparing behavioral parent training to behavioral parent training with parenting stress should be conducted for African American families. Given that externalizing problems did not predict parenting behaviors in this sample, researchers should also focus on what potential protective cultural factors in African American families could be influencing these associations.

The study findings also have important clinical implications. First, for pediatricians, who tend to be the first medical professionals to come in contact with children with ADHD, knowledge of the best diagnosis and treatment of ADHD is vital, given that ADHD is one of the three most common chronic disorders seen in primary care settings (Leslie, 2002). Thus, the current study findings highlight that parents of African American children with ADHD and conduct problems may be simultaneously experiencing significant levels of parenting stress, since they tend to come to receive mental health treatment when their child's symptoms are most impairing and severe (Hervey-Jumper et al., 2006). If pediatricians understand this relationship between externalizing problem and parenting stress, in order to provide the most comprehensive care to families, they should make sure to ask information about both the child's ADHD and conduct problems, and the parent's stress. For African American families, who already harbor more intense stigma about help-seeking (Tucker & Dixon, 2009), assessment of parenting stress at their child's yearly well-check or ADHD medication follow up appointment could help parents to feel heard and, as a result, to begin to change their schemas around health and mental health care. Lastly, understanding parenting stress in African American families could help pediatricians to give more accurate psychoeducation around ADHD and/ or conduct problems during their visit, which has been demonstrated to be extremely useful in improving treatment utilization and perceptions around ADHD for African American parents. Thus, my study

findings may be most relevant to pediatricians who see an exponential number of children with ADHD in their daily clinical work (Leslie, 2002).

Additionally, as parents who experience high levels of parenting stress are more likely to have difficulty implementing interventions that change their child's behavior (Theule, et al., 2013), these findings suggest that behavioral parent training should address parenting stress more directly (i.e., teaching problem-solving skills, self-care, and managing a variety of stressors; Kazdin & Whitley, 2003). Clinicians may need to give multiple sessions of psychoeducation about risk and signs of conduct problems in African American youth in order to increase early intervention and prevention of elevated symptoms. Finally, research explicates that African American families of children with ADHD are less likely to be engaged in treatment, have larger time gaps in between psychotherapy appointments, and are less likely to complete outpatient therapy (Chow et al., 2003; Hervey-Jumper et al., 2006). Given this and the current study findings**,** clinicians should consider how to tailor recruitment strategies and enhance the cultural relevance of their treatment for African American families, so that these families may seek treatment at higher rates and remain in treatment longer.

Conclusion

Given the need for studies that explore within-group differences between African American families of children with ADHD, the current study adds to the literature on parenting stress and practices among African American mothers of children with and without ADHD. Results indicated that child conduct problems and ADHD predict parenting stress, but not parenting behaviors in African American mothers. Further, conduct problems did not strengthen or weaken the relationship between ADHD and parenting stress. Ultimately, results of this study show that in addition to the everyday stress African American mothers experience, having a

child with ADHD and/or conduct problems adds additional stress to their parenting role. Research has demonstrated ADHD to be public health concern (Rowland et al., 2002) and that disparities in treatment and diagnosis exist for African American children (Tucker & Dixon, 2009). Therefore, results of this study may help future researchers and clinicians to ensure that current psychosocial treatment targets are culturally-appropriate for African American families of children with ADHD through inclusion of parenting stress and child conduct problems.

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Appendix

Table 1.

DSM-5 Description of ADHD Symptoms

Inattention	Hyperactivity/Impulsivity
a. Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities	a. Often fidgets with or taps hands or feet or squirms in seat.
b. Often has difficulty sustaining attention in tasks or play activities	b. Often leaves seat in situations when remaining seated is expected
c. Often does not seem to listen when spoken to directly	c. Often runs about or climbs in situations where it is inappropriate. (Note: In adolescents or adults, may be limited to feeling restless.)
d. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace	d. Often unable to play or engage in leisure activities quietly.
e. Often has difficulty organizing tasks and activities	e. Is often "on the go," acting as if "driven by a motor"
f. Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort	f. Often talks excessively
g. Often loses things necessary for tasks or activities	g. Often blurts out an answer before a question has been completed
h. Is often easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts).	h. Often has difficulty waiting his or her turn
i. Is often forgetful in daily activities	i. Often interrupts or intrudes on

Table 2.

Participant Demographics

Variable	ADHD	COMP	*t*-value	χ^2- value
Child Age, *M(SD)*	7.76 (1.35)	7.58 (1.40)	0.65	-
Child gender, *n* (% male)	26 (66.7)	13 (33.3)	-	0.49
Child grade, *n* (%)			-	4.13[a]
Kindergarten	2 (4.1)	3 (10.3)		
First Grade	15 (30.6)	8 (27.6)		
Second Grade	9 (18.4)	5 (17.2)		
Third Grade	13 (26.5)	9 (31.0)		
Fourth Grade	7 (13.7)	1 (3.4)		
Fifth Grade	3 (6.1)	3 (10.3)		
Maternal Age, *M(SD)*	36.09 (7.34)	35.52 (6.53)	0.18	-
Maternal Highest Level of Education, *n* (%)			-	8.37[a]
Partial High School	8 (16.3)	2 (6.9)		
High School Graduate	15 (30.6)	4 (13.8)		
Partial College	16 (32.7)	11 (37.9)		
College Graduate	9 (18.4)	8 (27.6)		
Graduate Degree	1 (2.0)	4 (13.8)		
Number of Children in Home, *M (SD)*	3.16 (1.72)	2.62 (1.05)	1.73	-
Marital Status, *n* (%)			-	4.84[a]
Single	34 (66.7)	21 (72.4)		
Married	9 (17.6)	7 (24.1)		
Separate/Divorced/Widowed	4 (7.8)	1 (3.4)		
Other	4 (7.8)	0 (0)		
Taking ADHD Medication, *n* (% yes)	17 (34.7)	0 (0%)	-	12.87***
Parenting Stress, *M (SD)*	86.89 (29.77)	66.32 (17.69)	3.73***	-
Involvement, *M (SD)*	41.27 (5.28)	41.93 (5.41)	-0.53	-
Positive Parenting, *M (SD)*	26.92 (3.12)	26.79 (2.87)	0.17	-
Conduct Problems, *M (SD)*	2.04 (3.16)	0.24 (0.69)	3.83***	-

Note: *** $p < .001$ (2-tailed); ** $p < .01$ (2-tailed); * $p < .05$ (2-tailed); [a] Likelihood ratio was used because the χ^2 expected counts assumption was violated.

Table 3.

Correlations among Dependent Variables for COMP and ADHD

Variable	1.	2.	3.	4.
1. PSI-SF	X	-.527**	-.170	-.089
2. APQ-Involvement	-.283	X	-.682**	-.072
3. APQ-Positive Parenting	-.258	.680**	X	.152
4. Conduct Problems	.330*	-.208	.013	X

The upper matrix displays the correlations among dependent variables for the COMP group (mothers of children without ADHD), and the lower matrix displays the correlations among dependent variables for the ADHD group (mothers of children with ADHD). APQ = Alabama Parenting Questionnaire; PSI-SF = Parenting Stress Index, Short Form Total Score. *p<.05, **p<.01, ***p<.001

Table 4

Hierarchical Multiple Regression of ADHD as a Predictor of Parenting Stress

	Model	B	SE B	ß	*t*	*p*
1	(Constant)	45.752	10.512		4.352	.000
	Child ADHD	20.570	6.211	.364	3.312	.001
2	(Constant)	40.702	11.634		3.498	.001
	Child ADHD	17.610	6.864	.311	2.566	.012
	ADHD Medication	8.010	7.913	.123	1.012	.315

R^2 = .132 for Step 1; R^2 = .145 for Step 2

Table 5

Hierarchical Multiple Regression of Conduct Problems as a Predictor of Parenting Stress

	Model	B	SE B	ß	*t*	*p*
1	(Constant)	73.793	3.358		21.978	.000
	Conduct Problems	4.627	1.328	-.255	3.484	.001
2	(Constant)	63.629	9.387		6.778	.000
	Conduct Problems	4.028	1.422	.331	2.833	.006
	ADHD medication	8.825	7.614	.135	1.159	.250

R^2 = .144 for Step 1; R^2 = .160 for Step 2

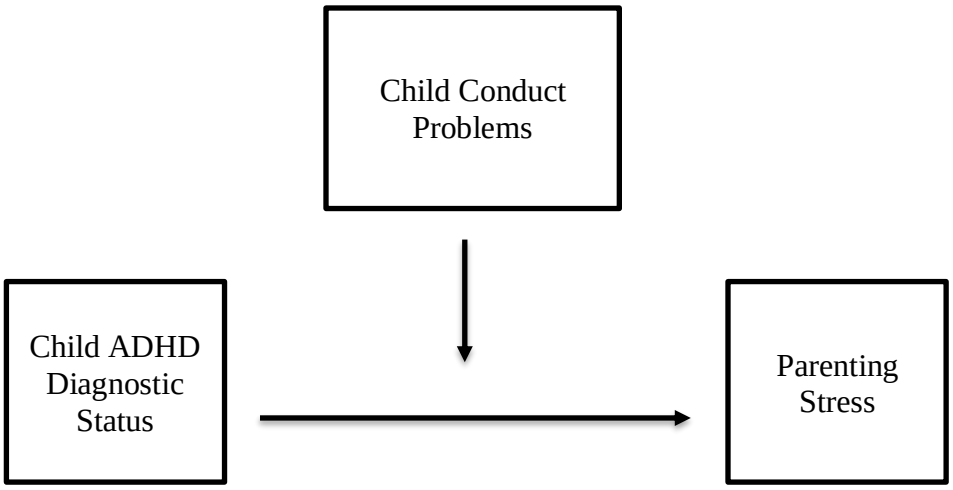

Figure 1. Conduct Problems as a Potential Moderator of the Relationship between Child ADHD and Parenting Stress

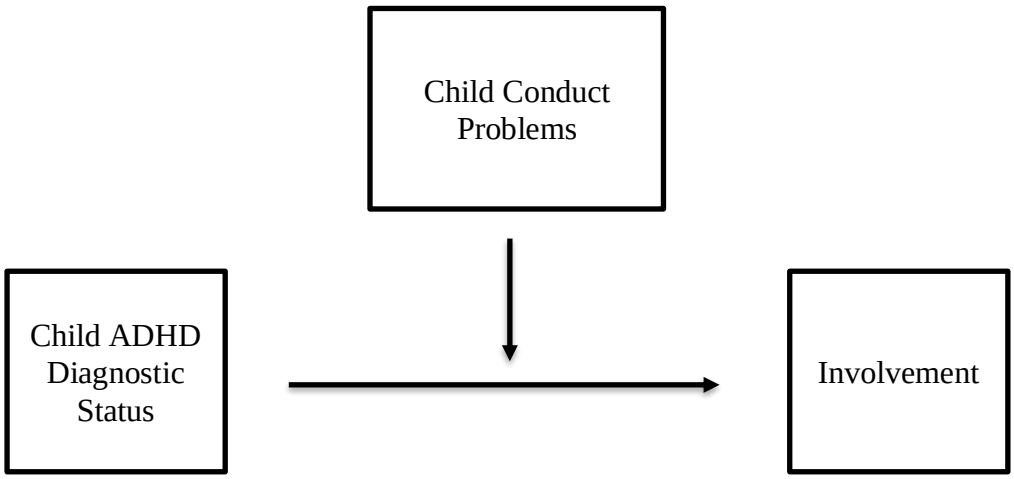

Figure 2. Conduct Problems as a Potential Moderator of the Relationship between Child ADHD and Involvement

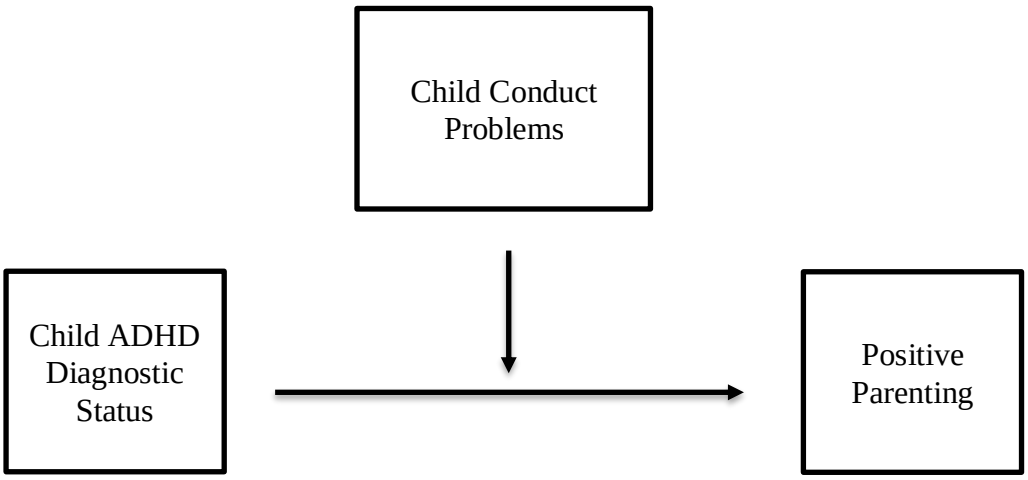

Figure 3. Conduct Problems as a Potential Moderator of the Relationship between Child ADHD and Positive Parenting

Vita

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