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Predictors of Barriers to Psychosocial Treatment for African American Families of Children with
ADHD

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

By

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Abstract

PREDICTORS OF BARRIERS TO PSYCHOSOCIAL TREATMENT FOR AFRICAN AMERICAN FAMILIES OF CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

By Stephanie Ann Wilson, B.A.

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

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African American families of youth with Attention-deficit/hyperactivity disorder (ADHD) traditionally have lower rates of ADHD treatment compared to nonminority groups. These treatment disparities underscore the importance of better understanding the barriers to treatment for these families. Therefore, in a sample of 67 African American caregivers of children with ADHD, the current study examined (1) factors that predict barriers to treatment for African American families of children with ADHD and (2) whether caregiver impairment mediates comorbid behavior problems and barriers to treatment for African American youth with ADHD. Analyses revealed that caregiver impairment predicted barriers to treatment and mediated the relationship between comorbid behavior problems and barriers to treatment. These findings highlight how caregiver impairment may play a significant role in preventing African American families from engaging in ADHD treatment for their child. Furthermore, targeting caregiver impairment in treatment may be particularly beneficial for African American families of youth with ADHD.

Predictors of Barriers to Psychosocial Treatment for African American Families of Children with ADHD

Attention-deficit hyperactivity disorder (ADHD) is one of the most common mental health disorders that pediatricians encounter in their patients (Ambalavanan & Holten, 2005). According to the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5), ADHD is a neurodevelopmental disorder characterized by pervasive, impairing, and developmentally inappropriate symptoms of inattention (e.g., making careless mistakes, failing to listen when spoken to, having difficulty organizing tasks, and being easily distracted or forgetful) and/or hyperactivity/impulsivity (e.g., fidgeting, running about excessively, interrupting others, and talking excessively; American Psychiatric Association [APA], 2013). ADHD is the most common youth psychological disorder with over 4 million youth meeting diagnostic criteria in the United States (Ambalavan & Holten, 2005; Froehlich et al., 2007; Larson, Russ, Kahn, & Halfon, 2011). To receive a diagnosis of ADHD, youth must demonstrate six or more symptoms of either inattention or hyperactivity/impulsivity, or both (APA, 2013). Depending on their symptoms, youth may be diagnosed with an inattentive presentation, a hyperactive/impulsive presentation, or a combined presentation (if their symptoms reflect both inattention and hyperactivity/impulsivity). Additionally, symptoms must cause significant distress or impairment and be present for at least 6 months in two or more domains (i.e., at home, at school, or with peers; APA, 2013).

As noted above, children who are diagnosed with ADHD may experience significant impairment at home, at school, or with their peers (Brown, Hertzler, & Findling, 2011). At home, a child with ADHD may experience significant family stress (Deault, 2010) or difficult parent-child relationships (DuPaul, McGoey, Eckert, & VanBrakle, 2001). Families of children with

ADHD, particularly parents, may experience increased stress and burden (Deault, 2010, DuPaul et al., 2001; Heath, Curtis, Fan, & McPherson, 2015; Podolski & Nigg, 2001; Theule, Wiener, Tannock, & Jenkins; 2013; Wiener, Biondic, Grimbos, & Herbert, 2016) as they oftentimes take on a primary role in their child's treatment and interventions (Sayal, Taylor, Beechman, & Byrne, 2002). For instance, they may take on an array of tasks involved in ADHD treatment such as managing their child's care, tracking appointments, administering medication, and negotiating with the school system for accommodations and special services. In the literature on the impact of work on family, the spillover effect hypothesis states that stress in one domain (e.g., home environment) may spillover to stress in other domain (e.g., work environment) and ultimately result in negative overall mood or affect (Hyde, Else-Quest, Goldsmith, & Biesanz, 2004). Taking this into consideration, unpleasant experiences (e.g., complaints from school) associated with having a child with ADHD may negatively affect a caregivers' work environment and overall affect. Overall, raising a child with ADHD can place increasing demands on families and caregivers and contribute to a difficult home setting (Anastopoulos, Guevremont, Shelton, & DuPaul, 1992; Bussing, Zima, et al., 2003).

In addition to the difficulties they may experience at home and with their families, children with ADHD may also have difficulties at school. For a child with ADHD, their symptoms may make it difficult for them to remain seated or complete homework assignments oftentimes resulting in school impairment characterized by low academic achievement, school failure, and stress with teachers (Mikami & Hinshaw 2006). Children with ADHD also often have comorbid intellectual and learning disabilities (Fennell & Ek, 2010; Lindblad, Gillber, & Fennell, 2011; Schnoes, Reid, Wagner, & Marper, 2006; Simonoff, Pickles, Wood, Gringras, & Chadwick, 2007). Additionally, children with ADHD have poorer academic achievement and

lower high school GPAs compared to their peers without ADHD (Bussing et al., 2012; Loe & Feldmand, 2007) and often perform below expected levels in reading, writing, and math (DeShazo Barry, Lyman, & Klinger, 2002).

Lastly, children with ADHD may also experience significant impairment with their peers (Waschbusch, 2002). For example, children with ADHD may experience peer rejection, social isolation, and social exclusion (Mikami & Hinshaw, 2006; Mikami, et al., 2013; Whalen & Henker, 1992). They are also twice as likely as typically developing children to have no reciprocated friendships (Blachman & Hinshaw, 2002; Hoza et al., 2005). It has also been suggested that having ADHD may result in social devaluation by peers (Canu et al., 2008). Taken together, children with ADHD experience impairment across various domains potentially resulting in numerous negative outcomes.

Children with ADHD are at risk for short- and long-term negative outcomes including legal, medical, and comorbid mental health problems. For example, they are more likely to experience delinquency and run-ins with law enforcement (Barkley, 2002). They are also more likely to have comorbid psychopathology, such as substance abuse, conduct problems, depression, and anxiety (Achilles, McLaughlin, & Croninger, 2007; Bagwell, Molina, Pelham, & Hoza, 2001; Brown, et al., 2011; Drabick, Gadow, & Sprafkin, 2006; Faraone et al., 1993; Faraone, Biederman, Mick, Williamson, Wilens & Spencer, 2000; Thompson, Riggs, Mikulich, & Crowley, 1996). Additionally, they are at increased risk for engaging in risk-taking behaviors, school dropout and/or failure, as well as disciplinary exclusion (e.g., suspension; Barkley, 2002). They are also more likely to experience poor health outcomes including nonfatal injuries, major injuries, hospitalizations, and visits to the emergency room (Leibson, Katusic, Barbaresi, Ransom, & O'Brien, 2001; Xiang, Stallones, Chen, Hosteller & Kellher, 2005).

In addition to the negative outcomes mentioned above, ADHD is also associated with a large economic burden (Pelham, Foster, & Robb, 2007; Tucker & Dixon, 2009). In their review, Pelham and colleagues (2007) found that ADHD was associated with increased healthcare visits, work loss for the parents, increased interactions with the juvenile justice system, and increased special education services. These factors ultimately influence the large economic impact of ADHD of roughly \$36-\$52 million per year (Pelham et al., 2007; Tucker & Dixon, 2009).

Overall, ADHD can affect multiple areas of a child's life and may cause legal, medical, and psychological difficulties. It is a pervasive disorder with symptoms and impairment that oftentimes persist well into adulthood (Brown et al., 2011; Ingram, Hectman, & Morgenstern, 1999). Despite the numerous detrimental effects that ADHD has on children, their families, and the economy, a number of families fail to seek treatment or formal interventions (Bussing, Koroljungberg, Gary, Mason, & Garvan).

Evidence-based Treatment for ADHD. The most efficacious treatment for children with ADHD is combined treatment, or a combination of pharmacological and behavioral interventions (Ambalavanan & Holten, 2005; Alfano & Biedel, 2014). Although studies have shown that, at least in the short term, this is a more effective treatment for ADHD than medication alone (Ambalavanan & Holten, 2005; MTA Cooperative Group, 1999), stimulants are often suggested as the first-line treatment for ADHD given their high efficacy and safety during a two year period (Ambalavanan & Holten, 2005; Elfron 2006; Biederman, Spencer, Wilens, 2004). Despite its high efficacy, some parents and caregivers of children with ADHD reject medication as an option for treatment due to concern about the short-term and long-term side effects (Berger et al., 2008; Friemoth, 2005; Schnittker, 2003).

Behavioral interventions for ADHD most often consist of behavioral parent training for the parents and other behavioral management strategies and techniques for the child (e.g., classroom behavior management; Chronis, Jones, & Raggi, 2006; Pelham & Fabiano, 2008). Behavioral parent training encourages change of the child's unwanted behavior (e.g., noncompliance) by focusing on the parent and his or her role as the agent of the child's behavior change. As such, in behavior parent training, the parent learns behavior management techniques (e.g., reinforcement, punishment, reward systems, ignoring, etc.) and ways to monitor progress. Although behavioral interventions for children with ADHD have demonstrated good efficacy, many families have difficulty with treatment adherence (Barkley et al., 2002; Cunningham et al., 1993). For example, many families may not attend treatment or may prematurely discontinue treatment (Barkley et al., 2002). Additionally, treatment may be disrupted by families showing up late to appointments, attending treatment sporadically, or failing to complete homework assignments (Cunningham et al., 1993). Overall, the ADHD treatment literature is extensive. However, the majority of studies on ADHD treatment in youth have consisted of primarily male and Caucasian samples (Rucklidge, 2008) contributing to a limited research-base on ADHD in other racial and ethnic groups, including African American youth (Hervey-Jumper et al., 2006).

ADHD in African American Youth

Prevalence. Multiple studies have suggested that ADHD is more prevalent in Caucasian youth than in African American youth (dos Reis et al., 2001; Pastor & Reuben, 2005; Stevens et al., 2005). However, ADHD is under-diagnosed in African American youth compared to Caucasian youth (Hervey-Jumper et al., 2006; Lee, Oakland, Jackson, & Glutting, 2008). African Americans are also less likely to report a history of ADHD in their family (Hervey-Jumper et al., 2006). This may be interpreted as evidence supporting the literature on lower prevalence rates of

ADHD in African Americans, or it may reflect misconceptions or unfamiliarity with ADHD symptoms among African Americans (Hervey-Jumper et al., 2006). It also may be indicative of lower rates of access to and use of mental health services among African Americans, resulting in lower rates of identification and diagnosis of ADHD in African American youth (Busing et al., 2003).

Symptom severity. Despite lower overall prevalence rates of ADHD diagnosed in African American youth, research has suggested that compared to Caucasian youth, African American youth have higher rates of symptom severity (Hervey-Jumper et al., 2006; Lee, Oakland, Jackson, & Glutting, 2008). ADHD symptom severity is often measured as an outcome variable (Epstein et al, 2010; MTA Cooperative Group, 1999) using symptom rating scales including the ADHD-IV Rating Scale (DuPaul, 1991) and the Vanderbilt ADHD Rating Scale (Wolraich et al., 2003). For example, Arnold et al. (2003) found that of a group of children diagnosed with ADHD, African American youth had significantly higher mean symptom ratings than Caucasian youth. Research has suggested that the higher rates of symptom severity seen in African American youth is potentially due to the fact that African American children sometimes experience significant delays between symptom onset and initiation of services, thus allowing their symptoms to become more frequent and more severe (Arnold et al., 2003; Bussing Zima, Gary, & Garvan, 2003).

It has also been found that teachers often report that African American youth have more ADHD symptoms than Caucasian youth (Reid, 1995) despite there being no evidence of a true neurobiological reason for racial differences in symptoms. Additionally, Epstein, and colleagues (2005) found in their study that there were racial differences in observed classroom behaviors in that African American children were rated as having more symptoms of ADHD than Caucasian

children. They posited a few interpretations of the differences in observed classroom behavior. First, they suggested that it is possible that classrooms with African American children are less structured and therefore influence higher teacher ratings of ADHD behavior. Additionally, they suggested that it is possible that as a group, African American youth express higher rates of ADHD symptoms. Lastly, they discussed the idea of referral bias in that African American youth must exhibit higher rates of ADHD symptoms than Caucasian youth in order to be referred for treatment, which may result in the higher rates of symptom severity that is seen in African American youth. Overall, this literature reflects that teachers may generally view African American youth as more problematic than Caucasian youth in the classroom (Abikoff, Courtney, Pelham, & Koplewicz, 1993).

Comorbidity. In addition to high rates of symptom severity, it has been suggested that African American youth with ADHD have high rates of comorbidities. For example, research has suggested that teachers may be more likely to mislabel African American children with symptoms of ADHD as oppositional compared to Caucasian children with the same symptoms (Pelham et al., 1989; Rabiner, Murray, Schmid & Malone, 2004; Reid et al., 2001). Consistent with many of the interpretations of the literature on ADHD in African American youth, the fact that African American youth with ADHD are rated as having more comorbidities may reflect (1) a tendency of African American youth to be resistant to treatment (i.e., showing more comorbidities as a result of ineffective treatment), (2) to have parents who engage in treatment-seeking only when symptoms have become severe (i.e., only presenting for ADHD assessments at the most severe point when comorbidities have developed), or (3) teacher bias, which has not been systematically studied.

ADHD health literacy. In addition to the racial differences in ADHD prevalence, symptom severity, and comorbidities, studies have suggested large racial disparities in ADHD health literacy. African American parents have reported less familiarity with and more misconceptions about ADHD compared to Caucasian parents (Bussing et al., 2007; Bussing, Gary, Mills, & Garvan, 2003; Bussing, Mills, et al., 2003; Bussing, Schoenberg, Rogers, Zima, & Angus, 1998). For example, Bussing, Schoenberg, and Perwien (1998) reported that African American parents are less likely than Caucasian parents to have heard of ADHD, to feel knowledgeable about ADHD, and to receive information from their physician about ADHD. In one study, Bussing and colleagues (2007) found that African American parents reported less awareness of ADHD and potentially relevant school services, both of which may lessen the likelihood of help-seeking behaviors for ADHD treatment. They also found that African American parents were more prone than Caucasian parents to attribute ADHD to sugar intake (Bussing et al., 2007) a notion not supported by science (Wolraich et al., 1994; Wolraich, Wilson & White, 1995). Additionally, Bussing et al. (2003) found that compared to Caucasians, African American families did not report as much concern over academic performance as it related to ADHD nor did they consider their child's behaviors as needing to be treated, oftentimes delaying treatment altogether. This is consistent with the findings that African American parents are more likely to seek ADHD treatment at later time points than Caucasian parents (dos Reis, Mychailszyn, Meyers & Riley, 2007). African American parents were also less likely to believe that ADHD is treatable with medication. These perceptions may contribute to lower perceived susceptibility and benefits of treatment and may additionally account for the low rates of stimulant use among African American youth (dos Reis et al., 2006; dos Reis et al., 2003; Schnitker, 2003).

Bussing, Schonenberg, Rogers, Zima and Angus (1998) suggest the reason African Americans have less knowledge about ADHD is because it has not yet become integrated into and understood by their communities. Additionally, the lack of knowledge in African American populations suggests that ADHD information sources and education lack cultural relevance and appropriateness (Bussing et al., 2007). Therefore, further exploration of culturally accessible and relevant avenues of teaching African Americans about ADHD (e.g., the medical sector, the school system; Austin & Husted, 1998; McMahon, Browning, & Rose-Colley, 2001) is needed.

Treatment-seeking behaviors. African American children traditionally have lower rates of ADHD treatment, particularly through the medical sector (Bussing, Zima, & Belin, 1998; Stevens, Harman, & Kelleher, 2005; Zarin, Suarez, Pincus, Kupersanin, & Zito, 1998; Zito, Safer, dos Reis, & Riddle, 1998) compared with nonminority youth groups (Leslie, Weckerly, Landsverk, et al., 2003; Zito, Safer, dos Reis, et al., 1997; Diala, Muntaner, Walrath, et al., 2000). A report using data from the National Health Interview Survey reported that ADHD diagnoses and the use of prescription medication for children with ADHD differed among Hispanic, African American, and White youth. Additionally, Bussing, Mills and colleagues (2003) found that African American families hesitate more often to seek out ADHD assessments.

African American parents are also less likely than their Caucasian counterparts to include school interventions as part of their treatment plan for children with ADHD (Bussing, Schoenberg, & Perwien, 1998; Bussing et al., 2003) and typically have more time between psychotherapy appointments (Hervey-Jumper et al., 2006). In one study, dos Reis, Mychailsyszyn, Myers, and Riley (2007) found that only after African American parents went through an extensive process of understanding their child's condition and their specific problems, did they engage in treatment. This is consistent with the literature suggesting that

compared to Caucasian children with ADHD, African American children with ADHD start treatment at later time points when symptoms become more severe. Adolescents living in poverty are also less likely to receive treatment than their more affluent peers, despite being more likely to meet diagnostic criteria for ADHD (Froehlich et al., 2007), an important implication given that African Americans make up 26 % of those in poverty in U.S. while Caucasians make up roughly 10% (U.S. Department of Commerce, 2015).

According to the Health Belief Model in Figure 1 (HBM; Rosenstock, 1974; Rosenstock, Srecher, & Becker, 1988), an individual's likelihood of engaging in treatment depends on five factors of health-related attitudes: perceived susceptibility to a health threat (i.e., how likely an individual feels that they could develop a certain condition), perceived severity of the health threat (i.e., perceptions of how serious the condition is), perceived benefits of protective health behaviors (i.e., an individuals' beliefs in a specific health behavior's capacity to prevent negative outcomes or provide positive outcomes), perceived self-efficacy regarding these protective behaviors (i.e., one's belief that they can engage in a specific protective behavior), and perceived barriers to performing these behaviors (i.e., obstacles that prevent or hinder engagement in behavior; Rosenstock, 1974; Rosenstock, et al., 1988).

Although this model has not been applied to ADHD interventions, it may suggest a number of explanations for the help-seeking behaviors of African American families of children with ADHD. For example, it may be that many African American parents of children with ADHD do not perceive their child's condition or symptoms to be severe (i.e., their likelihood of engagement in treatment-seeking is dependent upon their perceived severity) and therefore do not engage in help-seeking behaviors for their child's ADHD. Another example is that African American parents of children with ADHD may not feel that their children have mental health

condition or could develop a mental health condition (i.e., their likelihood of engaging in treatment-seeking behaviors is dependent on their perceived susceptibility); therefore, they do not engage in treatment-seeking behaviors. Overall, this model may help to explain why there are a number of differences in treatment-seeking behaviors between African American families of children with ADHD and Caucasian families of children with ADHD.

Overall, the racial disparities between African American and Caucasian youth with ADHD as well as the limited research of ADHD within African American populations suggest a need for increased research with these families and increased efforts to better understand barriers to ADHD treatment in the African American community. Specifically, the literature implies a need for medical, educational, and community professionals to learn these racial differences which will, in turn, improve communications between educational and healthcare professionals and parents, increase trust in education and medical systems among minority families, improve treatment for minority youth, reduce health disparities, and overall improve understanding of mental health in minority populations (Davison & Ford, 2001).

Potential Barriers to Mental Health Treatment for African American Families of Children with Mental Illness

Mental illness in African American youth. Despite having a significantly higher rate of mental disorders than any other racial group in the United States, African American adolescents receive mental health services including inpatient and outpatient services (Alexandre, Younis, Martins, & Richard, 2010; Wu, Katic, Liu, Fan & Fuller, 2010) far less often than Caucasian adolescents. Roughly 10% of African Americans with mental health problems utilize mental health services (Alvidrez, 1999). Additionally, those African American youth who do seek mental health services remain in treatment for shorter periods of time than Caucasian youth (Bui

& Takeuchi, 1992). In order to improve mental health care for African American youth, researchers need to better understand what prevents them from utilizing mental health care services and treatment.

Availability and accessibility of service. African Americans families of children with mental illness tend to report more barriers to using mental health services and more barriers to positive treatment outcomes than families of other racial groups (Bussing et al., 2003; Bains, 2014; Breland-Noble, 2013; Hervey-Jumper et al., 2006; Sue, Fujino, Hu, Takeuchi, & Zane, 1991; Takeuchi, Leaf, & Kuo, 1988). Two of the prominent barriers to treatment reported by African Americans are availability and accessibility of mental health services. (Alvidrez, 1999). For example, African Americans report difficulties finding transportation to available services or difficulty finding mental health services that are local. Time to partake in mental health care also influences availability (Diala, et al., 2000; Leaf et al., 1987; Takeuchi et al., 1988).

Perceptions of mental illness and mental health care system. Within the African American community, stigma is a primary barrier to mental health treatment (Alvidrez, 1999; Cheatham, 2008). For example, among minority college students, Silva de Crane and Spielberger (1981) found that there were more negative views of mental health compared to Caucasian college students. It has also been suggested that racial minority populations attribute inappropriate causes to mental health problems (e.g., imbalance of hot and cold, weakness of character, lack of moderation or willpower, and supernatural or spiritual causes; Millet, Sullivan, Schwebel, & Meyers, 1996; Padilla & Salgado de Snyder, 1988). Such causal attributions may affect treatment-seeking and mental health care utilization. Studies have also suggested that racism in the mental healthcare system (Cheatham, 2008) and lack of trust in the mental health care system (Hervey-Jumper, Douyon et al., 2006), particularly a lack of trust in clinician's

ability to treat severe mental health disorders (Fall, Levitov, Anderson, & Clay, 2005) affects African Americans' treatment-seeking and mental health care utilization.

Socioeconomic status (SES). SES has also been suggested as a barrier to psychosocial treatment for African American youth (Cheatham, 2008). For example, African American boys in poverty are the least likely of youth to receive treatment for a mental disorder (Substance Abuse and Mental Health Services Administration, 2009). One study looking at the effects of SES on treatment-seeking behaviors, found that lower SES individuals were more likely than higher SES individuals to demonstrate concern about others' attitudes on their treatment-seeking behaviors, which may affect their treatment utilization (Leaf et al., 1987). Additionally, African American parents often report that their financial status and related factors (e.g., no insurance, lack of private insurance) are associated with decreased initiation and continuation of treatment (Allen, 1995; Fernandez & Eyberg, 2009; Pelkonen, Marttunen, Laippala, & Lönnqvist, 2000). African American parents also report that other socioeconomic-related factors including mental health services being too costly and not being able to afford travel and transportation to the mental health service location influence their treatment-seeking behaviors (Thurston & Phares, 2008). Kaiser and Hultquist (2015) note that poorer living conditions and neighborhood safety and isolation are socioeconomic-related factors which influence African American mothers' treatment-seeking behaviors. Longtin and Principe (2014) also report that socioeconomic status may influence African American parents' awareness of treatment resources for their children with mental health conditions ultimately affecting their treatment-seeking behaviors. Overall, numerous studies highlight SES and SES-related factors as barriers to psychosocial treatment for African American youth and their families.

Additional barriers to treatment. Other studies have found additional barriers to treatment for African American families of children with mental health problems to include available child care, a feeling of responsibility for their community, a feeling of emasculation associated with treatment-seeking, a lack of awareness of the need for primary healthcare, a belief that they should rely on family members to deal with mental health problems, peer influence, and religious beliefs (Alvidrez, 1999; Cheatham, 2008).

Despite the lower rates of treatment-seeking behaviors for mental health, studies have suggested that there are circumstances in which minority populations are utilizing mental health services. For example, racial and ethnic minority populations are more likely to seek help for a mental disorder for substance abuse problems, if the individual has family members or friends who have sought mental health services, or if the cause of mental disorder was believed to be attributed to environmental factors (Alvidrez, 1999). Additionally, African American adolescents are more likely to receive mental health care through the school or through emergency services (Husky, Kanter, McGuire, & Olfson, 2012). Overall, barriers to treatment for African Americans are extensive and should be addressed in order to reduce racial mental health disparities in mental health treatment.

Statement of the Problem

It is clear from the literature that there are a number of barriers to psychosocial treatment for African American families of children with mental illness which result in racial disparities in mental health care service utilization. However, very little is known about what barriers may exist specifically for African American families of children with ADHD. Therefore, the current study sought to identify predictors of the unique barriers for these families and what factors may explain these predictors. Understanding the unique barriers to treatment for African American

families of children with ADHD is the first step in being able to reduce the barriers and addressing the barriers for these families will help close the gap of untreated African American children with ADHD and reduce the burden placed on the family, the school, the healthcare system and the economy overall.

Study Aims and Hypothesis

The current study was part of a larger study on the efficacy of motivational interviewing for African American caregivers of children with ADHD in changing help-seeking behaviors. The current study had two primary aims. First, this study sought to examine factors that predict barriers to psychosocial treatment for African American families of children with ADHD. Based on the prior literature discussed above, the current study aimed to investigate relationships among child and family demographic variables, comorbid behavior problems, and child impairment with their caregiver as predictors of barriers to psychosocial treatment. The second aim of this study was to investigate whether, within African American families of children with ADHD, child impairment with their caregiver mediates, or explains, the relationship between comorbid behavior problems (i.e., rule-breaking behavior and aggressive behavior) and barriers to psychosocial treatment.

Hypothesis 1. As a proxy for SES, it was hypothesized that total family income would predict barriers to participation in treatment.

Hypothesis 2. It was hypothesized that child impairment with their caregiver would predict barriers to participation in treatment.

Hypothesis 3. It was hypothesized that both comorbid child rule-breaking behavior problems and aggressive behaviors would predict barriers to participation in treatment.

Hypothesis 4. It was hypothesized that child impairment with a caregiver would mediate the relationship between youth comorbid behavior problems (i.e., rule-breaking behavior and aggressive behavior) and barriers to participation in treatment after controlling for total family income.

Method

Participants

Participants in this study were the caregivers ($M_{age} = 35.00$, $SD_{age} = 10.41$, 93% female) of 67 African American youth with ADHD ages 5 to 11 ($M = 7.50$, $SD = 1.72$, 24% female). Caregivers were included in the study if they identified as African American and had a child with a previous diagnosis of ADHD. Additional demographic information is included in Table 1.

Procedure

All participant caregivers and their children were recruited through the general pediatric primary care practice at Children's Hospital of Richmond at Virginia Commonwealth University (VCU). With Institutional Review Board approval, research staff contacted caregivers of patients with ADHD to gauge interest in the study and screened interested caregivers for eligibility based on inclusion criteria and exclusion criteria. Phone screens were conducted by graduate-level clinicians and caregivers were either ineligible or declined participation. No family contact information was retained for caregivers who declined participation in the study. See Figure 7 for details regarding subject recruitment.

Once recruited into the parent study, participants went to either the Children's Hospital of Richmond at VCU or a research lab on the academic campus for their appointment. All participants were randomized to either treatment-as-usual (TAU) or to the brief motivational

interviewing condition; caregivers were blind to the assigned condition. Caregivers were then given full details and information regarding the study and gave their consent. Next, caregivers completed questionnaires assessing the child's ADHD symptoms, impairment, comorbidities, and family demographics. Caregivers in the TAU condition completed their participation in the study at this point and were told to pursue any treatment of their choice based on their discussions with their child's physician. Caregivers in the motivational interviewing condition were provided with information about evidence-based treatment for ADHD and given numerous treatment options for further discussion (e.g., psychoeducation, outpatient therapy, school interventions, psychopharmacological intervention). The study clinician used motivational interviewing techniques (e.g., a menu of choices, open-ended questions, affirmations, reflections, and summaries) to help the caregiver decide on a treatment to discuss and then pursue. To ensure treatment fidelity, all study visits were audio-recorded, and a second blind-to-treatment-condition study clinician completed an integrity checklist to ensure adherence to protocol. Baseline, 3-month follow-up, and 6-month follow up data concerning help-seeking and perceived barriers were collected for all participants via phone. All participants were compensated up to \$125 for their participation in the study. For the current study, only baseline data on both groups was used for analyses.

Measures

Demographics. The demographic questionnaire administered to caregivers contained 28 items on both caregiver and child characteristics (e.g., age, gender, race), family environment, caregiver education, socioeconomic status, current and past service utilization (e.g., psychotherapy and medication), and child behavior problems.

ADHD-IV Rating Scale. The ADHD-IV symptom checklist for ADHD (DuPaul et al., 1998) was used to assess children's current symptoms and impairment associated with ADHD. Caregivers completed this checklist over the phone with a graduate level clinician. On this checklist, caregivers were asked to rate DSM-IV symptoms of ADHD in their child by selecting the presence of their symptoms as either "very often," "often," "sometimes," or "never or rarely." Cronbach's alpha for the ADHD-IV rating scale in this study is .87.

Impairment Rating Scale (IRS). The IRS (Fabiano et al., 2006) assesses adult perceptions of child functioning in multiple domains (e.g., academic performance, classroom functioning, family functioning, and relationships with peers, siblings, parents, and teachers). For this study, caregivers rated the severity of the child's impairment on a 7-point scale, ranging from 0 (No problem) to 6 (Extreme problem). The measure has convergent and divergent validity with other impairment scales and predictive validity in identifying children with ADHD diagnoses (Fabiano et al., 2006). For the current study, the item which assesses caregiver impairment was of primary interest given the literature suggesting that caregiver-related impairment is a primary concern for children with ADHD and their families. See measure items in the appendix.

Child Behavior Checklist. The Child Behavior Checklist (CBCL; Achenbach, 1991; Achenbach & Rescorla, 2001) was used to assess for comorbid psychopathology in the youth. The CBCL was administered to all caregivers to assess competencies and problem areas in children using a dimensional approach. The CBCL provides syndrome profiles (e.g., clinical, borderline clinical or normal ranges) compared to other children of the same gender and age range. The syndrome profile is composed of the following scales: Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention

Problems, Rule-Breaking Behavior, Aggressive-Behavior, and Other Problems. This scale demonstrates good psychometric properties with a Cronbach's alpha of .94 (Achenbach & Rescorla, 2001). For the purposes of this study, only the Rule Breaking and Aggressive Behavior subscales was used as the measures of comorbid behavior problems, given their distinction from ADHD-related symptoms.

Barriers to Psychosocial Treatment. The Barriers to Treatment Participation Scale (BTPS) contains 44 items to assess various barriers that impede families' participation in treatment (Kazdin, Holland, Crowley & Breton, 1997). The BTPS contains four subscales: 20 items that assess stressors and obstacles that compete with treatment, ten items that assess treatment demands and issues, eight items that assess perceived relevance of treatment and six items that assess the relationship with the therapist. On this measurement, individuals are asked to rate perceived barriers to participation in treatment on a 5-point scale from 1 (never a problem) to 5 (very often a problem). In the current study, all four subscale scores as well as the total barriers score was used. This BTPS has demonstrated high internal consistency (Kazdin et al., 1997). Cronbach's alphas in this study for the four BTPS subscales and total barriers score: stressors and obstacles that compete with treatment, treatment demands, perceived relevance of treatment and relationship with therapist are .92, .81, .77, .76 and .958 respectively.

Data Analytic Plan

Data Preparation. Prior to conducting analyses, means, standard deviations and 95% confidence intervals were estimated for all continuous variables. Frequencies were calculated for categorical variables. Data was examined for normality and homogeneity of variance was assessed using the Levene's test. If the homogeneity of variance did not pass the recommended significance value of .05 in the Levene's test, the Welsh and Brown-Forsythe tests in the Robust

Tests of Equality of Means were examined as recommended by Pallant (2007). Violations of assumptions of normality and homogeneity of variance were evaluated to determine the need for modification of analyses. Outliers were examined for errors in data coding. Outliers not attributed to errors in data coding were changed to a less extreme but still high value as recommended by Tabachnick and Fidell (2007). Linearity was examined by generating a matrix of scatterplots between variables. Finally, multicollinearity was assessed by examining the correlations between independent variables. Independent variables that demonstrated multicollinearity greater than .80 were included in the model together, centered around their means or dropped from the model as recommended by Tabachnick and Fidell (2007). As there is not enough literature to propose an a priori hypothesis about the different barriers to treatment subscales, the relationships between the predictor variables and each barriers subscale were investigated.

Characteristics of the Sample. To describe the sample, means, standard deviations, and ranges for dimensional demographic and dependent variables were calculated. Percentages were calculated for categorical demographic and dependent variables.

Specific Aim Analyses. All analyses were conducted using structural equation modeling (SEM). To address Aim 1 (i.e., examine factors that predict barriers to psychosocial treatment), simultaneous linear regressions were conducted. Predictor variables of interest were entered simultaneously as there is no current literature to suggest why one particular variable of interest would predict the barriers to treatment over and above another. Therefore, all predictor variables of interest were entered into the regression analyses to see which of those predict the different barriers to treatment subscales and total score. The predictor variables of interest included

impairment in the caregiver domain, total family income, and comorbid behavior problems (i.e., rule-breaking and aggressive behavior).

To address Aim 2 (i.e., explore child impairment with their caregiver as a potential mechanism through which the relationship between rule-breaking behavior and barriers to treatment as well as the relationship between aggressive behavior and barriers to treatment might be explained), mediation analyses were conducted using modern bootstrapping. Bootstrapping was used for several reasons. First, bootstrapping allows for a more conservative test of mediation with smaller samples (Preacher & Hayes, 2004). Second, bootstrapping does not assume normality of the distribution which is often violated. Third, bootstrapping allows for a test of the total, direct, and indirect effects of the independent variable (i.e., comorbid behavior problems) on the dependent variable (i.e., barriers to treatment). Mediation is determined by examining whether the 95% confidence interval (CI) for the indirect effect spans zero. If the CI does not span zero, there is evidence for mediation (Cheung & Lau, 2007). As total family income did not predict barriers to participation in treatment, it was not controlled for in both mediation analyses.

Results

Preliminary Results

Initial data checking assessed the presence of normality, multivariate outliers and linearity. These assumptions were evaluated by examining Mardia's normalized estimates (Yuan, Bentler, & Zhang, 2006) as well as skewness and kurtosis where values of ± 2 are generally accepted as a normal distribution (George & Mallery, 2010). Mardia's normalized estimates detected significant non-normality in the data (Yuan et al., 2006). As such, Maximum Likelihood Robust (MLR) estimation methods, often used in structural equation modeling (SEM) to correct

for sample univariate and multivariate non-normality, were used (Enders, 2001; Muthen, 2011). While samples of 200 participants or more are often recommended for SEM, smaller samples are also justifiable with less complex models (Sideridis, Simos, Papanicolaou, & Fletcher, 2014; Wolf, Harrington, Clark, & Miller, 2013). Outliers in the data were addressed by imputing raw scores from a z-score of 3.29 as recommended by Tabachnick and Fidell (2007). All primary analyses were conducted using structural equation modeling (SEM) in Mplus Version 7.4 (Muthen & Muthen, 2015) which computes standard errors and a chi-square test of model fit. Significance for all tests was established at an alpha level of .05, two-tailed.

Missing data. Preliminary analysis of missing data values identified the absence of 7.5% of ratings from caregiver ratings of total barriers to treatment. However, Little's chi-square test for missing data revealed that data were missing completely at random (MCAR), that there were no particular patterns of missingness (Little, 1988). Therefore, Full Information Maximum Likelihood (FIML) was used as an estimation method to replace missing data on variables of interest. FIML is a modern technique that uses all case values, in addition to estimates of standard errors, to estimate the most likely value of a missing case rather than excluding cases with missing data.

Multicollinearity. Initial analyses of multicollinearity found that aggression and rule-breaking behavior were too highly correlated to be included in to the regression model together. After conducting correlation analyses (see below), it was found that aggression was positively correlated with the barriers to treatment total score $r(60) = .286, p = .024$, treatment demands $r(64) = .257, p = .037$, treatment relevance $r(63) = .305, p = .013$, and relationship with the therapist $r(65) = .346, p = .004$, whereas rule-breaking behavior evidenced no significant relationship with any of the barriers variables. Therefore, primary analyses (i.e., regression and

mediation analyses) were conducted only with aggression, dropping rule-breaking behavior as a variable of interest.

Correlation analyses. First, correlation analyses between child variables (e.g., child age, child gender, and age at which child was diagnosed with ADHD) and barriers to treatment were conducted. No significant relationships between these variables were found. Second, correlation analyses between all variables of interest were conducted. There were positive correlations between caregiver impairment and the four subscales of the BTPS: treatment demands $r(64) = .434, p < .01$, treatment relevance $r(63) = .444, p < .01$, relationship with therapist $r(65) = .400, p < .01$, and stressors $r(62) = .361, p < .01$. There were also positive correlations between aggressive behavior and all four subscales of the BTPS: treatment demands $r(64) = .257, p < .05$, treatment relevance $r(63) = .305, p < .05$, relationship with therapist $r(65) = .346, p < .01$, and stressors $r(62) = .295, p < .05$. 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., total family income, caregiver impairment, and aggression) predicted barriers to treatment. Five separate models were conducted, one model with the total barriers score as the dependent variable and four other models with each of the barrier subscales as the dependent variables. Caregiver impairment was the only significant predictor of barriers to treatment in all five models and was significant in each model (all $ps < .01$). Caregiver impairment significantly predicted total barriers ($\beta = .527, p = .001$), treatment demands ($\beta = .409, p < .001$), treatment stressors ($\beta = .272, p = .012$), treatment relevance ($\beta = .357, p = .001$), and relationship with the therapist ($\beta = .293, p = .009$). Results of these regression analyses supported only Hypothesis 2, that caregiver impairment would predict

barriers to treatment. Hypotheses 1 and 3, that family income and rule-breaking behavior would predict barriers to treatment, were not supported.

Mediation analyses. To investigate Hypothesis 4, the tests of indirect effects were conducted using SEM with 5000 bootstraps to provide a 95% confidence interval. The results of the mediation analyses are described in turn below.

Caregiver Impairment Mediating Aggression and Treatment Demands. In the model testing the indirect effect of treatment demands on aggression as mediated by caregiver impairment (Figure 3), results indicated that aggression significantly predicted caregiver impairment ($\beta = .527, p < .001$) and caregiver impairment significantly predicted treatment demands ($\beta = .414, p < .001$). The overall model indicated that caregiver impairment significantly mediated the relationship between aggression and treatment demands ($\beta = .218, p < .001$), CI = [.106, .331].

Caregiver Impairment Mediating Aggression and Treatment Stressors. The third model testing the indirect effect of treatment stressors on aggression as mediated by caregiver impairment was significant ($\beta = .149, p = .006$), CI = [.042, .256]. Specifically, results indicated that aggression significantly predicted caregiver impairment ($\beta = .527, p < .001$) and caregiver impairment significantly predicted stressors ($\beta = .283, p = .005$; see Figure 4).

Caregiver Impairment Mediating Aggression and Treatment Relevance. Results of the model testing the indirect effect of treatment relevance on aggression as mediated by caregiver impairment (Figure 5) indicated that aggression significantly predicted caregiver impairment ($\beta = .527, p < .001$) and caregiver impairment significantly predicted treatment relevance ($\beta = .392, p < .001$). The overall mediation pathway model was significant ($\beta = .207, p < .001$), CI [.091, .323].

Caregiver Impairment Mediating Aggression and Relationship with Therapist. The model testing the indirect effect of relationship with the therapist on aggression as mediated by caregiver impairment was also significant (Figure 6; $\beta = .159, p = .006$), CI [.046, .272]. Specifically, aggression significantly predicted caregiver impairment ($\beta = .527, p < .001$) and caregiver impairment significantly predicted the relationship with therapist ($\beta = .301, p = .005$).

Caregiver Impairment Mediating Aggression and Total Barriers. To test Hypothesis 4, the indirect effect of the barriers to treatment participation total score on comorbid behavior problems as mediated by impairment with the caregiver was performed. Results indicated that aggression significantly predicted caregiver impairment ($\beta = .527, p < .001$) and caregiver impairment significantly predicted total barriers ($\beta = .417, p = .001$). As would be expected by these results, the indirect effect of total barriers on aggression via caregiver impairment was also significant ($\beta = .220, p = .005$) and the bootstrapped 95% confidence interval for the indirect effect was (.067, .372); see Figure 2 for indirect effect of the barriers to treatment participation total score on aggression via caregiver impairment. In sum, Hypothesis 4 (the mediation model) was supported.

Discussion

This study aimed to identify factors that predict barriers to psychosocial treatment for African American families of children with ADHD and examine the nature of those relationships. Of all predictor variables, caregiver impairment was the only one to emerge as a significant predictor of barriers to treatment. Additionally, caregiver impairment was found to mediate the relationship between aggression and barriers to treatment. These results indicate that for African American families of youth with ADHD, impairment with their caregivers plays a

key role in preventing these families from seeking and engaging in ADHD treatment for their child.

The current study findings on caregiver impairment as a predictor of barriers to treatment for children with ADHD are consistent with previous study findings. For example, Sayal and colleagues (2002) note in their article on treatment for children with ADHD symptoms, that service use was largely influenced by parent factors, such as parental perception of problems, which is another way to conceptualize caregiver impairment. Parents who report more impairment in their relationship with their child may also feel less satisfied as a parent and have lower levels of self-efficacy which have been linked to treatment-seeking behaviors in caregivers of youth with ADHD (Hoza et al., 2000; Jiang, Gurm & Johnston, 2012; Maniadaki, Sonuga-Barke, & Kakouros, 2006). Further, the construct of caregiver impairment as measured by the IRS may be a significant predictor of barriers to treatment, because it may be capturing other constructs and areas of impairment that influence barriers to treatment. Specifically, the IRS asks parents to report how their child's problems affect their relationship. Given the broad nature of this question, it is possible that caregivers are reporting other parenting-related factors that are common in caregivers of youth with ADHD (e.g., parenting stress and burden) which also correlate to treatment-seeking behaviors (Griest, & Forehand, 1983; McMahon, 1981; Smith, Koertin, Latter, Knowles, McCann, Thompson, & Sonuga-Barke, 2015). Specifically, Jones and colleagues found that in a sample of caregivers of children with ADHD, those most likely to engage in treatment were those with higher levels of parenting stress. Finally, impairment with a caregiver may reflect a relationship that consists of negative parent-child interactions or poorer overall family dynamics which may influence their reported barriers to treatment. Overall, the

findings that caregiver impairment predicts barriers to treatment for caregivers of children with ADHD are consistent with the existing literature.

Furthermore, while aggression did not predict barriers to treatment in the simultaneous linear regression model, there was evidence of mediation meaning that it did indirectly predict barriers to treatment by means of caregiver impairment. Also, when run as a single predictor in the regression model, aggression was a significant predictor of treatment barriers. This suggests that caregiver impairment accounted for the variability and was a better predictor of treatment barriers when included in the regression model with aggression.

The finding that caregiver impairment mediated the relationship between comorbid aggression and barriers to treatment is not surprising given that parents with more aggressive children may be more likely to report more impairment in their relationship with their child. Numerous studies on parenting and aggression in youth suggest that youth aggression is often associated with difficult parent-child relationships (Eichelsheim, Buist, Dekovic, Wissink, Frijns...Meeus, 2010; Ostrov & Bishop, 2008; Pasiak & Menna, 2015). For example, in their sample of elementary school students and their parents, Sengsavang and Krettenauer (2015) found that aggression in youth predicted negative parent-child interactions. Additionally, youth aggression has been linked to parenting practices (e.g., hostile parenting) and parenting cognitions (e.g., maternal self-esteem, parental psychological control, negative attitudes towards parenting) that may influence the parent-child relationship (Kuppens et al., 2009; Lau, Marsee, Lapré, & Halmos, 2016; Mahoney et al., 2003; Priddis, Landy, Moroney & Kane, 2014; Stover et al., 2006; Walters, 2015). Overall, the existing literature on aggression and parenting highlights how aggression in youth may reflect a number of factors in caregivers and their parenting that may contribute to poor parent-child relationships.

In the preliminary analyses, correlations between all variables of interest were examined. Rule-breaking behavior did not correlate with treatment barriers. This was surprising given rule-breaking behavior was highly correlated with aggression which was highly correlated with treatment barriers. There are a number of possible reasons why findings did not show significant correlations between rule-breaking behavior and treatment barriers. First, the majority of the participant sample fell above the mean on rule-breaking behavior. Specifically, the sample range was fairly small; therefore, there may not have been enough variability in the sample to find significant correlations between rule-breaking behavior and treatment barriers. Additionally, rule-breaking behavior, while correlated with aggression, may be measuring a different construct altogether that may influence its relationship with treatment barriers. For example, some of the items on the CBCL aggression subscale represent an element of emotion regulation or temperament (e.g., arguing, demanding attention, sulking, screaming, being loud, mood instability; Coccaro, 2003) that does not exist in many of the items of rule-breaking behavior. This represents an element of emotion regulation in the construct of aggression as measured by the CBCL that may influence treatment-seeking behaviors differently than the construct of rule-breaking behavior. Finally, while I would expect rule-breaking behavior to be correlated with treatment barriers given it was so highly correlated with aggression which was highly correlated with treatment barriers, the current findings did replicate those of Kazdin, Holland, and Crowley (1997). In their study on barriers to treatment in a sample of youth with oppositional, aggressive and antisocial behaviors, Kazdin, and colleagues (1997) found no significant correlations between rule-breaking behavior in youth and treatment barriers as rated by parents. Although it was not specifically called “rule-breaking behavior,” their subscale included a number of the same rule-breaking symptoms that were measured in the current study (e.g., fighting, stealing,

vandalism and property damage). This demonstrates how the current study is consistent with literature that has begun to tease apart the constructs of aggression and rule-breaking behavior. Ultimately, because rule-breaking was not correlated with treatment barriers it was dropped as a variable of interest in the primary analyses.

Total family income did not predict barriers to treatment. This may be due to the fact that there was not enough variability of income in the sample. The majority of participants (i.e., 88%) fell below a total family income of \$30,000. According to the U.S. Census Bureau, for a family with one caregiver under age 65 and one child living in the home, the poverty threshold is roughly \$16,000. For a family with one caregiver under the age of 65 with two children in the home, the poverty threshold is roughly \$19,000. With the majority of participants falling into these categories of a single caregiver and one-two children in the living in the home, roughly 70% of the sample fell below the corresponding poverty threshold. Therefore, the current study's homogenous low-income may contribute to a lack of findings of total family income as a predictor of barriers to treatment.

Limitations

Despite the value in the study findings, there are a number of limitations that should be discussed. First, this study found relatively low scores on barriers to treatment (See Table 2). These findings of low mean scores on total barriers are consistent with the literature on barriers to treatment for youth utilizing the BTPS with similar populations as the current study sample (e.g., African American mothers; Colonna-Pydyn, Gjesfjeld, & Greeno, 2007; Kazdin, 2000; Kazdin et al., 1997; Kazdin & Wassell, 2000). Given the low rates of mental health service use (Alexandre et al., 2010; Wu et al., 2010; Alvidrez, 1999; Bui & Takeuchi, 1992) and numerous barriers to treatment reported by African Americans (Bussing et al., 2003; Bains, 2014; Breland-

Noble, 2013; Hervey-Jumper et al., 2006; Sue et al., 1991; Takeuchi et al., 1988) the low scores on the BTPS both throughout the literature and in this study may (1) reflect an inability of this measure to adequately capture barriers to treatment for the populations in the studies its used for and specifically for the current study, or (2) highlight unique characteristics of the sample of African American caregivers of youth with ADHD that have decreased barriers to treatment. The BTPS was developed from focus group discussions with therapists; therefore, it may not adequately capture caregiver-reported barriers. Additionally, items on the BTPS currently overlap with constructs such as working-alliance, consumer satisfaction, and cultural competence (Colonna-Pydyn et al., 2007). These factors suggest future research should consider development of a barriers to treatment scale developed from the service use consumers that better captures the construct of barriers and can tease apart the overlapping constructs in the current measure (Colonna-Pydyn et al., 2007). Further qualitative data collection about barriers to treatment specifically for African American families of youth with ADHD may help to potentially identify unique barriers for this population which may not have been captured with the use of the BTPS.

A second limitation of this study is that it only uses one method of behavioral assessment (i.e., self-report on rating scale), only one informant source (i.e., caregiver), and it does not distinguish ADHD presentation. The literature emphasizes the importance of using a multi-method approach (e.g., clinical interview, behavioral questionnaires, and direct observation) and multi-informant sources (e.g., parent, teacher, and child) for comprehensive behavioral assessments in youth (DiBartlo & Grills, 2006; Pelham, Fabiano, & Massetti, 2005). Research has pointed at the discrepancy in impairment based on ADHD symptom presentation. This is even more important given that ADHD presentation varies greatly by gender in African American communities. As such, future research should consider examining the barriers to

treatment for African American as they may vary across gender and ADHD symptom presentation. Overall, the results might not reflect a complete view of the child's behavior and impairment as they relate to and predict barriers to treatment for African American families of children with ADHD. Further research on barriers to psychosocial treatment for African Americans should include multiple forms of behavioral assessment and multi-informant sources.

A third limitation of this study is that it does not allow for inferences about the differences in barriers to treatment participation across race/ethnicity. The current study findings can only be compared to the existing literature on barriers to treatment for families of youth with ADHD which has consisted of primarily Caucasian samples. As such, future research should consider sampling a diverse population (e.g., Latino, African American) in order to conduct racial/ethnic group comparisons of barriers to treatment participation.

A fourth limitation of this study is that a number of potential participants were lost during the recruitment process. As shown in Figure 7, over 234 caregivers were initially contacted regarding their interest in participating in this study. For various reasons (e.g., missed phone call attempts, disinterest in participating, ineligibility, and no shows), the final sample number was 67. The fact that there were only 120 phone screens conducted from the original 234 caregivers who were contacted, 81 research sessions completed from the 92 participants who were eligible, and 14 no shows may reflect potential factors or barriers (e.g., disconnected phones, missed phone call attempts, time constraints, absence of transportation, scheduling conflicts, etc.) that impeded prospective participants from continuing in the recruitment process and from ultimately being in the study. The fact that a number of caregivers were not included in the study potentially due to numerous barriers may help inform why there were such low ratings on the BTPS. Additionally, this may impact the inferences that can be drawn about potential barriers to

treatment for the sample African American caregivers of children with ADHD given the current study sample may not be representative of a broader sample. One way to address this concern might be to assess reasons for no-shows and disinterest in participation which may help to inform barriers to treatment for African American caregivers of children with ADHD. Overall, it is important to understand the impact that barriers may have had on the current sample and how this impacts the generalizability of study findings.

A fifth limitation of this study is the lack of generalizability of findings given the relatively homogeneous sample. First, all participants in this sample were recruited from pediatric primary offices meaning they had access to primary healthcare (e.g., transportation) and lived in an urban city; therefore, making generalizability to middle-upper class African American populations, who may live in a suburban or rural environment, difficult. Second, all of the caregivers' children in this study had a diagnosis of ADHD. Knowing that ADHD is often underdiagnosed and misdiagnosed in African American youth (Hervey-Jumper et al., 2006), it is likely that the sample is not representative of the broader sample of African American youth with symptoms of undiagnosed ADHD, thus making generalizability to that population more difficult as well. Third, the majority of youth in this study were on medication. As noted in the literature, African American populations are less likely to accept medication as a form of treatment (dos Reis et al., 2006; dos Reis et al., 2003; Schnitker, 2003). Therefore, given the acceptability of pharmacological treatment in the current sample, this sample may differ in important ways from other African American families. For instance, they may be further along in their readiness to change and subsequently may be less likely to report numerous barriers to treatment. The Transtheoretical Stages of Change model (Prochaska & DiClemente, 1983), one of the most prominent resources in understanding behavior change, states that behavior change is cyclical

and occurs in stages (i.e., pre-contemplation, contemplation, preparation, action, and maintenance) according to a number of factors, such as attitude. It is also suggested within this model that readiness to change can be understood by a series of processes, such as consciousness raising (i.e., seeking information about the problem), counter-conditioning (i.e., substituting new behaviors for problem behaviors) and stimulus control (i.e., controlling situations that may trigger relapse into the old behaviors; DiClemente & Prochaska, 1998). While this model was originally developed to better understand change in smoking behavior, it has been applied to other areas (e.g., dietary and weight management; Wilson & Schlam, 2004) and can be applied to this area to help foster understanding of readiness to change for the African American caregivers of children in this sample. For example, caregivers in the current study may be in the action stage exemplified by their engagement in medication treatment for their child; thus there may be difficulty generalizing these findings to a large portion of African American youth with ADHD who are not on medication. Overall, each of these factors (i.e., recruitment from pediatric primary care offices, prior diagnosis of ADHD, and children on medication) highlight sample characteristics correlated with fewer treatment barriers, which may not accurately reflect a broader sample of African American caregivers of children with ADHD. To address the lack of generalizability it is important to consider ways to broaden the sample (e.g., not requiring a diagnosis of ADHD).

Future Directions

Overall, caregiver impairment was the most salient predictor of barriers to treatment and not only did it predict barriers to treatment, it explained the relationship between youth comorbid aggression and barriers to treatment. These findings inform ADHD treatment for African American communities. First, they highlight factors which may influence treatment options for

African American youth with ADHD. The current study sample reported both high levels of aggression and caregiver impairment. Given caregiver impairment plays a primary role in treatment-seeking for African American youth with ADHD and comorbid aggression, clinicians may consider screening patients for impairment with their caregiver to be able to identify problems early and intervene early. It may also be important to consider screen patients for impairment with their teacher as their child's impairment with their teacher may motivate parents to seek help for their child. Additionally, African American youth with ADHD with high levels of aggression and subsequently high caregiver impairment may benefit from psychotherapy that directly targets caregiver impairment early in treatment. Furthermore, these findings help to inform African American caregivers' perceptions about ADHD treatment options. For example, as African American caregivers of youth with ADHD are less likely to consider ADHD treatable with medication (dos Reis et al., 2006; dos Reis et al., 2003; Schnitker, 2003), it may benefit researchers and clinicians to know that in African American youth with ADHD these perceptions may be held due to caregiver impairment being the underlying problem. While ADHD symptoms may be reduced with medication, improving caregiver impairment may be better addressed through psychotherapy, thus validating caregivers' hesitancy of medication as a treatment option.

Relatedly, the current study's findings suggest that within the psychotherapy treatment option, interventions for African American youth with ADHD may benefit from targeting caregiver impairment. For example, behavioral parent training is an evidence-based form of psychotherapy that can impact the parent-child relationship which may be particularly beneficial for African American caregivers of children with ADHD and comorbid aggression. Further, components within behavioral parent training that target the parent-child relationship such as positive one-on-one time, praise, and parent-child interaction therapy (PCIT) may be particularly

valuable for this population. Parent-child interaction therapy (PCIT) is an evidence-based behavioral parent intervention for children with behavioral problems and involves in vivo coaching of parents through bug-in-ear technology behind a one-way mirror (Chronis-Tuscano, Lewis-Morrarty, Woods, O'Brien, Mazursky-Horowitz, & Thomas, 2016). The primary aim of PCIT is to improve the parent-child relationship and foster warmth and responsiveness to their child (Baumrind, 1967; Gallagher, 2003; Shcuhmann, Foote, Eyberg, Boggs, 1998). PCIT has been shown to be effective in youth with ADHD (Wagner & McNeil, 2008) and has also yielded good treatment acceptability from caregivers (Wilson & Jennings, 1996). Overall, these components of behavioral parent training may be particularly useful for African American caregivers of youth with ADHD in reducing caregiver impairment.

Finally, this study is valuable for clinicians. Knowing that caregiver impairment plays a primary role in barriers to treatment for African American families of youth with ADHD, clinicians should consider asking caregivers about their relationship with their child in assessing treatment options, recognizing that those caregivers reporting high impairment and child aggression may find it difficult to engage in treatment for their child. Furthermore, clinicians should consider ongoing monitoring of the parent-child relationship (e.g., check-ins during medical or therapy visits) to be better informed about potential fluctuations in treatment progress.

Conclusion

In sum, this study is important given it adds to literature of the most common youth psychological disorder in the most under-researched population. African American families of children with ADHD rarely seek treatment due to numerous barriers and this study provides information regarding those specific barriers for these families in obtaining psychosocial treatment. While results of this study help to inform barriers to treatment for African American

families of youth with ADHD it may be beneficial to test the Health Belief Model (Rosenstock, 1974; Rosenstock, Srecher, & Becker, 1988) with these families to better understand treatment-seeking behaviors in African American families of youth with ADHD.

This study suggests that psychoeducation of ADHD to promote early identification, assessment, and diagnosis of ADHD in African American youth may be useful to ensure that African American youth with ADHD undergo treatment services early before their impairment with their caregiver progresses and becomes an impediment to treatment. With ADHD a public health concern and a large economic burden, being able to address the barriers to treatment for African American families will help to reduce the burden placed on the family, the school, and the healthcare system and will ultimately help reduce the racial mental health disparities overall. Additionally, understanding the unique barriers to treatment for African American families of children with ADHD is the first step in being able to reduce those barriers and addressing the barriers for these particular families will help close the gap of untreated African American children with ADHD. Overall, these findings inform researchers, clinicians, and other interventionists that in African American communities, the stress, distress, and burden that ADHD places on caregivers is an important factor in treatment-seeking.

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Appendix A

Table 1.

Participant Demographics

Variable	<i>N (%)</i>	<i>M (SD)</i>
Caregiver Gender (% female)	62 (92.5)	
Child Gender (% female)	16 (23.9)	
Caregiver Age		35 (10.41)
Child Age		7.49 (1.71)
Children on ADHD Medication	60 (89.6)	
Total Family Income		
Less than 9,999	30 (44.8)	
10000-19000	17 (25.4)	
20000-29999	12 (17.9)	
30000-39999	4 (6.0)	
40000-49999	1 (1.5)	
Over 50000	3 (4.5)	

Table 2.

Descriptive Statistics for Measures

Variable	Range	<i>M (SD)</i>
Total Family Income		
CBCL Aggression	50-100	70.16 (13.06)
CBCL Rule-Breaking Behavior	50-80	65.10 (9.61)
IRS Parents	1-7	3.82(2.19)
BTPS Treatment Demands	10-50	16.68 (7.06)
BTPS Treatment Relevance	8-40	13.31 (5.47)
BTPS Relationship with Therapist	6-30	9.43 (4.37)
BTPS Stressors	20-100	29.47 (12.64)
BTPS Total	44-140	67.31 (22.06)

Table 3.

Correlation Analyses

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Total Family Income	-								
2. IRS Parents	-.247*	-							
3. CBCL ODD	-.056	.459**	-						
4. CBCL AGG	-.105	.527**	.878**	-					
5. BTPS Treatment Demands	-.122	.434**	.173	.257*	-				
6. BTPS Treatment Relevance	-.229	.444**	.229	.305*	.820**	-			
7. BTPS Relationship with Therapist	-.124	.400**	.223	.346*	.806**	.806**	-		
8. BTPS Stressors	-.126	.361**	.209	.295*	.804**	.811**	.840**	-	
9. BTPS Total	-.141	.453**	.203	.286*	.878**	.866**	.885**	.891**	-

Note: ** $p < .01$ (2-tailed); * $p < .05$ (2-tailed)

Table 4.

Summary of the 5 Multiple Regression Analyses for Variables Predicting Barriers to Treatment

Variable	<i>B</i>	β	SE β	Sig. (<i>p</i>)
Total Barriers				
Total Family Income	-.464	-.028	.115	.808
Caregiver Impairment	4.100	.409	.128	.001**
Aggression	.099	.059	.135	.663
Treatment Demands				
Total Family Income	-.101	-.019	.101	.852
Caregiver Impairment	1.316	.409	.106	.000**
Aggression	.019	.035	.174	.841
Treatment Stressors				
Total Family Income	-.361	-.038	.115	.744
Caregiver Impairment	1.569	.272	.109	.012**
Aggression	.147	.152	.196	.438
Treatment Relevance				
Total Family Income	-.544	-.132	.103	.202
Caregiver Impairment	.888	.357	.110	.001**
Aggression	.039	.094	.176	.593
Relationship with Therapist				
Total Family Income	-.107	-.032	.095	.736
Caregiver Impairment	.583	.293	.111	.009**
Aggression	.063	.188	.168	.262

Note: ** $p < .01$ (2-tailed); * $p < .05$ (2-tailed)

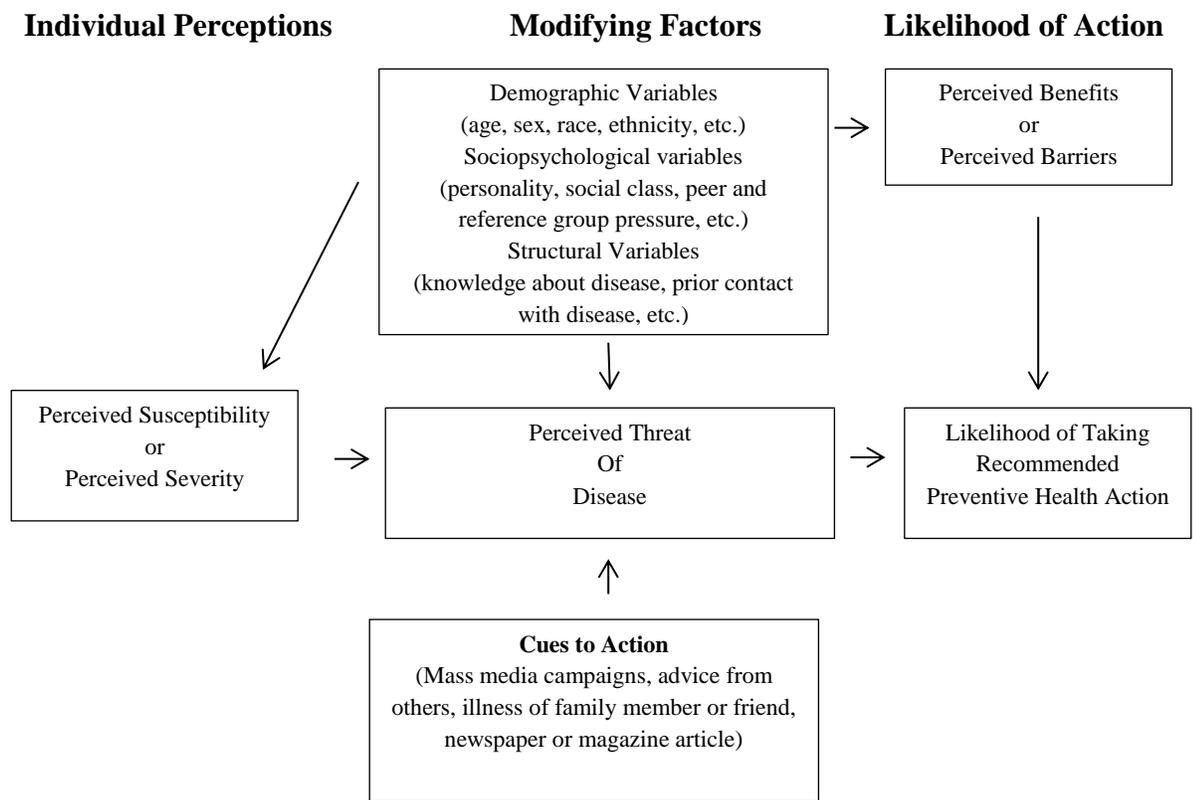


Figure 1. The Health Belief Model

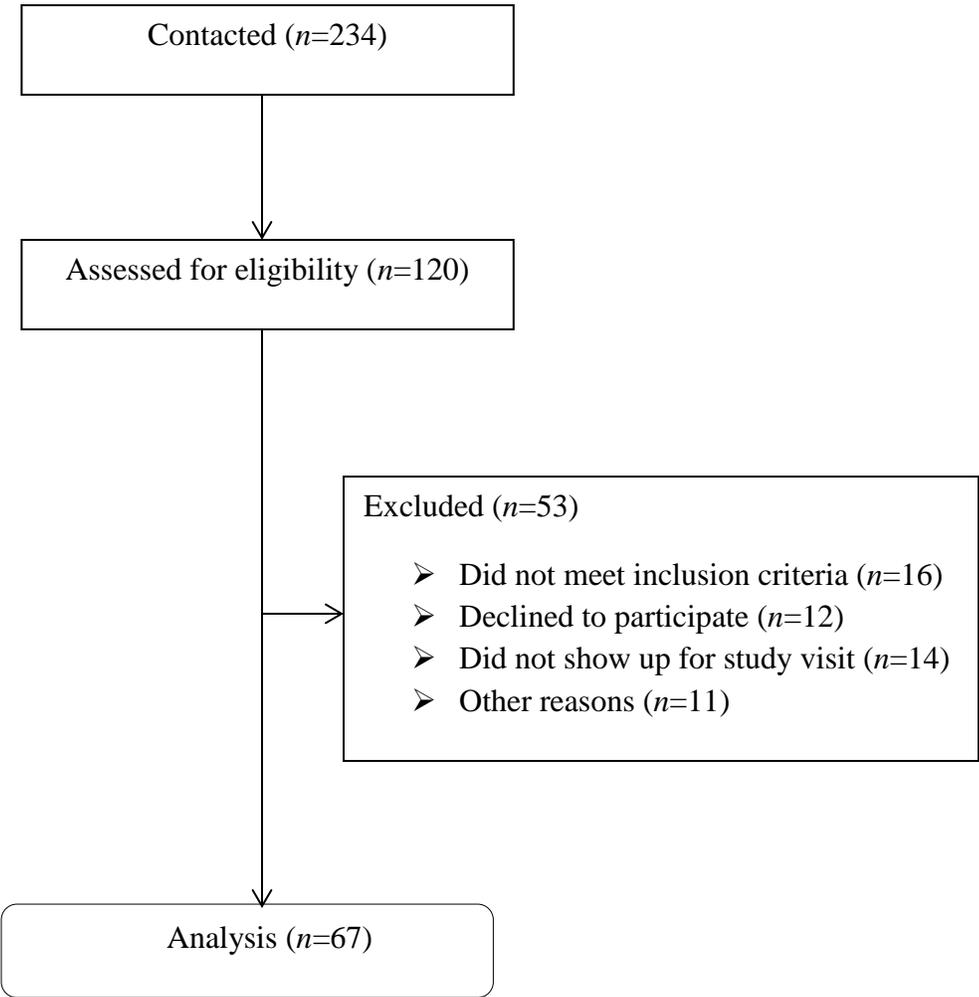


Figure 2. Consort Diagram

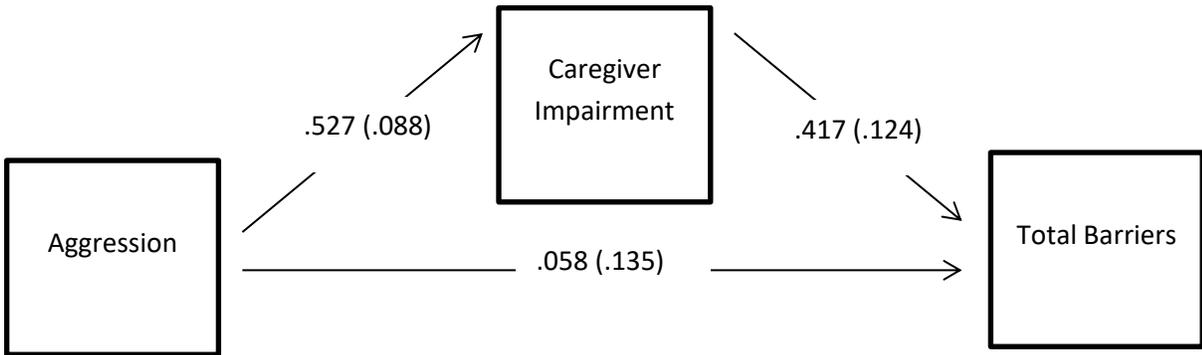


Figure 3. Caregiver Impairment Mediating the Relationship between Aggression and Total Barriers

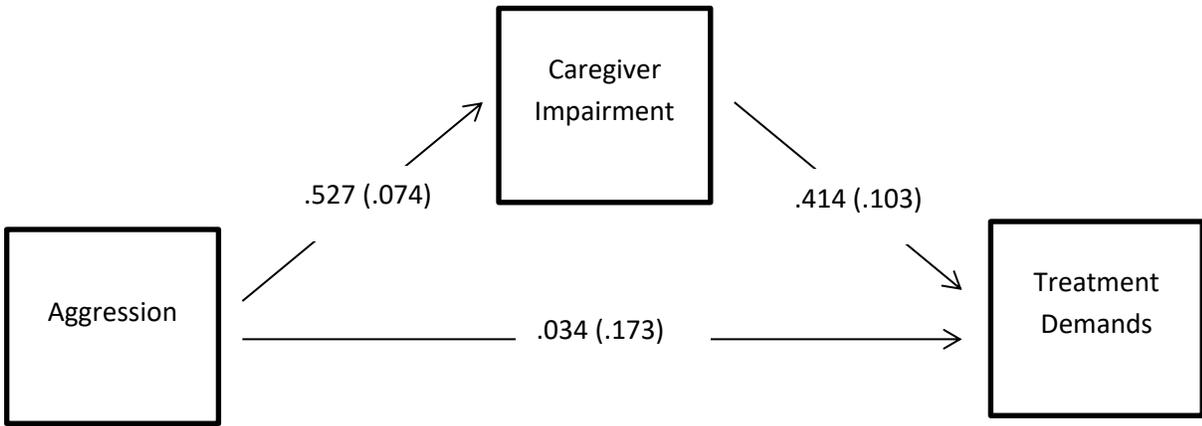


Figure 4. Caregiver Impairment Mediating the Relationship between Aggression and Treatment Demands

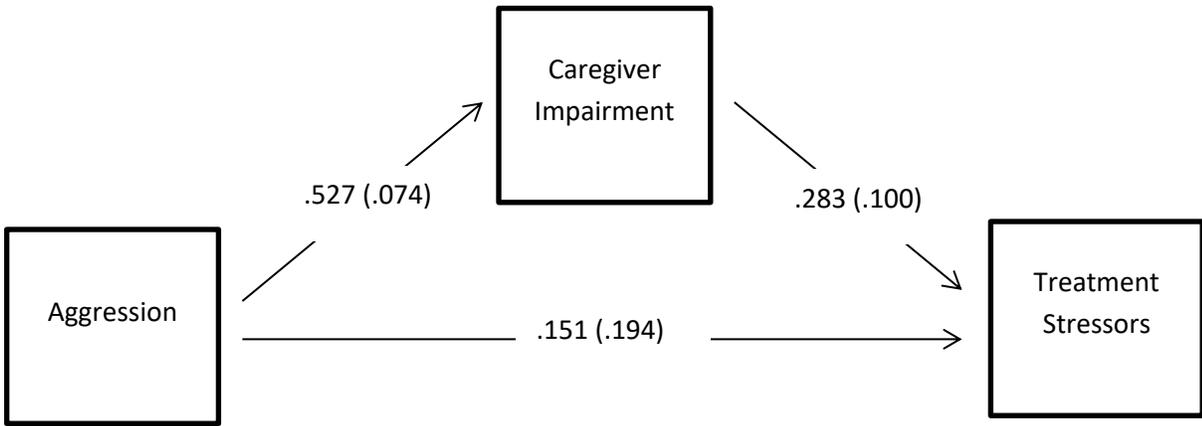


Figure 5. Caregiver Impairment Mediating the Relationship between Aggression and Treatment Stressors

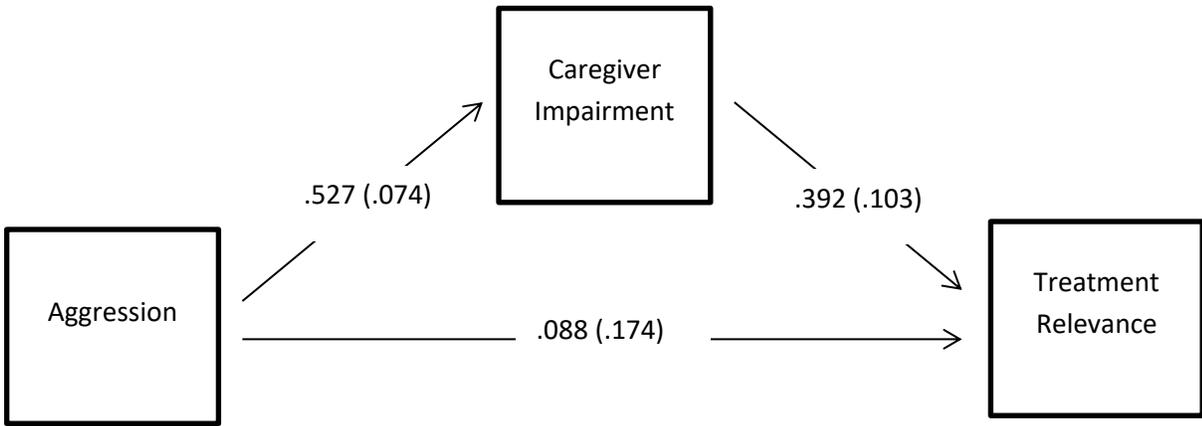


Figure 6. Caregiver Impairment Mediating the Relationship between Aggression and Treatment Relevance

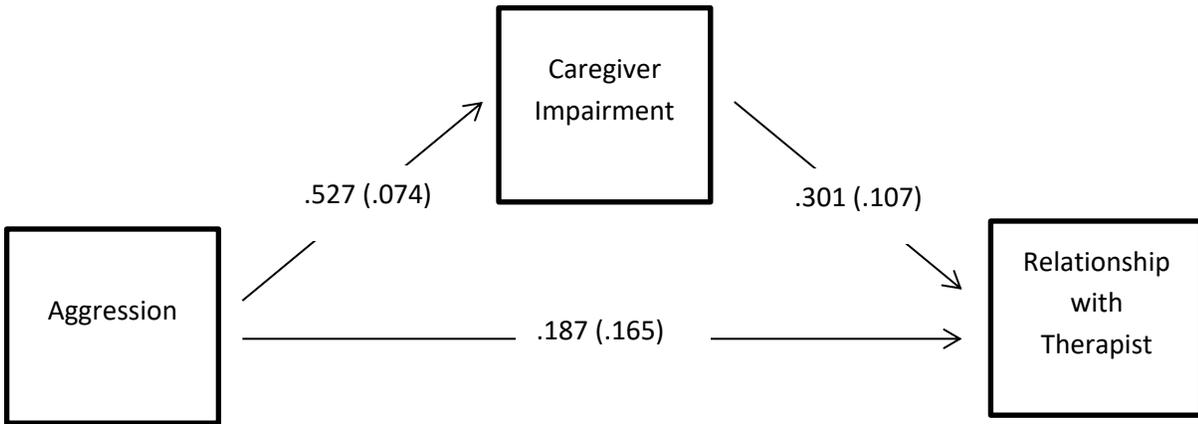


Figure 7. Caregiver Impairment Mediating the Relationship between Aggression and Relationship with Therapist

Appendix B

Impairment Ratings Scale (IRS) Items

1. How your child's problems affect his or her relationship with playmates.
2. Regardless of whether your child is popular or unpopular with peers, does he or she have a special, close "best friend" that he or she has kept for more than a few months?
 - a. Yes
 - b. No
3. How your child's problems affect his or her relationship with brothers or sisters
 - a. My child does not have siblings
 - b. My child does not have regular contact with siblings
4. How your child's problems affect his or her relationship with you (and a parenting partner if present)
5. How your child's problems affect his or her academic progress at school
6. How your child's problems affect his or her self-esteem
7. How your child's problems affect your family in general
8. Overall severity of your child's problem in functioning and overall need for treatment.

Vita

Stephanie Ann Wilson was born on March 8th, 1991 in Washington, D.C., and is an American citizen. She graduated from Maret School, Washington, D.C. in 2009. She received a Bachelor of Arts in Psychology and Spanish from Temple University, Philadelphia, Pennsylvania in 2013. Prior to beginning her education at Virginia Commonwealth University in 2015, she worked for two years on a study researching youth emotions at Temple University, Philadelphia, Pennsylvania.