ABSTRACT

Title of Dissertation: **EXECUTIVE FUNCTIONING AND PARENTING IN MOTHERS OF CHILDREN WITH AND WITHOUT ADHD**

Heather Mazursky-Horowitz, Doctor of Philosophy, 2018

Dissertation directed by: Professor and Director of Clinical Training, Andrea Chronis-Tuscano, Department of Psychology

Parental scaffolding robustly predicts child developmental outcomes, including improved self-regulation and peer relationships, and fewer externalizing behaviors. However, few studies have examined parental characteristics associated with a parent's ability to scaffold. Executive functioning (EF) may be an important individual difference factor associated with parental scaffolding. Yet, no research has examined parental EF in relation to scaffolding. Scaffolding may be particularly important for children with attention-deficit/hyperactivity disorder (ADHD) due in part to their core difficulties with inattention, disorganization, EF, and self-regulation, and the resulting need for greater structure, supervision, and consistency from parents. Moreover, parents of children with ADHD may experience greater challenges with scaffolding, both as a result of having a child with ADHD and their own increased risk for EF deficits. Yet, little research has examined child ADHD in relation to parental scaffolding. This study extends the extant

literature on EF and parenting by examining individual difference factors associated with maternal scaffolding, and utilizing a multi-method assessment of maternal EF that may more effectively tap specific EF deficits associated with scaffolding. The current study aimed to examine: (1) the association between maternal EF and scaffolding, (2) the association between child ADHD symptoms and scaffolding, and (3) the interaction between child ADHD symptoms and maternal EF in predicting observed scaffolding. We hypothesized that deficits in maternal EF and child ADHD symptoms would each be negatively associated with observed scaffolding, and that child ADHD symptoms would interact with maternal EF deficits to predict the greatest deficits in observed maternal scaffolding. Results partially supported our hypotheses, in that some aspects of maternal EF, as measured by Digit Span and the Hotel Test, were predictive of observed maternal scaffolding. However, child ADHD symptoms did not significantly predict maternal scaffolding after controlling for child age, maternal education, and maternal EF; nor did the interaction of maternal EF and child ADHD symptoms. Working memory and task shifting may therefore be key components of parental EF that could be targeted in interventions designed to improve parental scaffolding.

EXECUTIVE FUNCTIONING AND PARENTING IN MOTHERS OF CHILDREN WITH AND WITHOUT ADHD

by

Heather Mazursky-Horowitz

Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2018

Advisory Committee:
Professor Andrea Chronis-Tuscano, Chair
Professor Lea R. Dougherty
Assistant Clinical Professor Julia Felton
Professor Kirby Deater-Deckard
Associate Professor Brenda Jones Harden (Dean's Representative)

Acknowledgements

First, I would like to express my appreciation to my Dissertation committee: Dr. Andrea Chronis-Tuscano, Dr. Kirby Deater-Deckard, Dr. Lea Dougherty, Dr. Julia Felton, and Dr. Brenda Jones Harden. It was a privilege to share my research with each of you. Your feedback and insight are invaluable to my future development. Second, words cannot express my gratitude to my mentor, Dr. Chronis-Tuscano for her time, wisdom, and guidance. Our work together has inspired me to be a better researcher. Third, thank you to Sharon Thomas, Kelsey Woods, and research assistants for your help running the experiment and to Jeffrey Chrabaszcz for your statistical wisdom. This project would not have been possible without your dedication and commitment. Lastly, the most special thanks go to my family and husband, Ben, for their unconditional support through this process.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

Background

Importance of Parental Scaffolding in Child Development

Parental scaffolding is defined as providing structured assistance to a child with the purpose of helping the child achieve a goal that s/he could not reach on his/her own (Hammond et al., 2012). The aim of scaffolding is to meet a child at his/her developmental level in order to assist the child in developing emotional and behavioral regulation strategies so that s/he can gradually master goal-directed activities independently (Bibok, Carpendale, & Muller, 2009). The term scaffolding was developed from Vygotsky's earlier research on the zone of proximal development, which is described as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978). Vygotsky emphasized the need for adults to understand the child's current developmental level, in order to provide the most effective assistance. Scaffolding is therefore an ideal way for parents to support their children's incremental learning in order for them to develop the skills necessary to eventually solve tasks on their own.

Scaffolding helps children achieve goals in the short term, while also teaching self-regulation in the long term. In other words, scaffolding may be a way for parents to act as their children's external regulators while teaching them strategies to gradually self-regulate. Researchers have thus proposed that parents' use of "guided participation" in their children's problem solving may be a key mechanism by which children learn to self-

regulate (Luria, 1966; Vygotsky, 1978). Therefore, parental scaffolding is an important area of research to better understand parenting influences on child development.

Parental scaffolding robustly predicts child developmental outcomes, including improved self-regulation and peer relationships, and fewer externalizing behaviors (Garstein & Fagot, 2003; Hammond et al., 2012). For example, in a longitudinal study, Smith, Landry and Swank (2000) found that children developed better executive functioning (EF) skills when their parents used verbal scaffolding (i.e., instructive/elaborative utterances) as opposed to only directive instructions (i.e., telling the child exactly what to do). Smith et al. (2000) explained that parents' use of verbal scaffolding with their children provided more complex language models from which the children could represent future problems and solutions. Directive instructions, on the other hand, were seen as providing children with fewer opportunities to make their own choices. Because parental scaffolding requires parents to meet their children at their developmental level, younger children may need more directive instructions than older children. For example, Landry, Smith, Swank, Assel, and Vellet (2001) emphasized the importance of parents decreasing their use of directive instructions as children increasingly develop competencies. Scaffolding therefore requires parents to be constantly aware of their child's abilities and needs in the moment in order to effectively provide support, which may be more challenging for some parents than others. Although one study found that higher maternal education was related to a mother's increased use of scaffolding behaviors, no other studies have examined individual parental characteristics associated with effective scaffolding, despite the importance of scaffolding for child development (Neitzel & Stright, 2004).

Executive Functioning & Parenting

One parental individual difference factor that may be particularly relevant to scaffolding is EF. EF is an umbrella term for a host of cognitive processes and corresponding behaviors that function within an individual to achieve a goal, including planning, working memory (WM), inhibition, mental flexibility, and the initiation and monitoring of tasks (Chan et al., 2008). For example, WM is defined as the ability to hold information in one's awareness and manipulate that information in order to achieve a goal (Barkley, 1997). Additionally, attentional control is defined as the ability to sustain and shift attention (cognitive flexibility) as necessary, in the face of potential distractors (Bell & Deater-Deckard, 2007). EF skills such as these underlie an individual's ability to utilize time management, self-organization, emotional self-control, self-restraint, and self-motivation (Barkley, 2011). All of these processes have been shown to impact an adult's ability to succeed occupationally, effectively run a household, and develop and maintain social relationships (Goel, Grafman, Tajik, Gana, & Danto, 1997; Green, Kern, Braff, & Mintz, 2000). Although EF has been found to predict many aspects of adult functioning (e.g., mental health status, response to interventions), surprisingly few studies have examined the relation between adult EF and parenting, despite that the two are conceptually linked.

Parenting requires planning and problem solving skills, flexibility, and the ability to manage multiple demands. As such, EF deficits in the areas of WM, organization, emotion regulation, and planning, may interfere with a parent's ability to successfully implement effective parenting strategies (Johnston, Mash, Miller, & Ninowski, 2012). Among various aspects of EF, WM has been most often studied in relation to parenting.

In one study, Deater-Deckard et al. (2010) demonstrated that mothers with poorer WM, as measured by Digit Span (a subtest of the Wechsler Adult Intelligence Scale; WAIS-IV, 2008), were observed to exhibit more reactive negativity with their children than mothers with better WM. Others have found that maternal EF predicted changes in child EF over time through the quality of observed maternal caregiving (Cuevas et al., 2013). Additionally, another study found that maternal early life experiences, including maltreatment and parental loss, indirectly predicted maternal sensitivity, through maternal hypothalamic-pituitary-adrenal function and spatial WM (Gonzalez, Jenkins, Steiner & Fleming, 2012). Specifically, poorer spatial WM and cognitive flexibility were associated with less sensitive maternal parenting, which included a mother's ability to recognize and attend to her infant's cues while integrating environmental demands. Thus, maternal EF may be one important individual difference factor associated with parenting quality in general, and with a parent's use of effective scaffolding in particular.

A recent literature review published on the relation between maternal emotional and cognitive control capacities and parenting concluded that low maternal emotional and cognitive control capacities were associated with negative parenting practices (harsh, punitive or inconsistent parenting), while more control capacities were associated with positive parenting practices (sensitivity, warmth, monitoring, involvement, and consistency) (Crandall, Deater-Deckard, & Riley, 2015). However, it was noted in this review that there was very little consistency in measurement of maternal emotional and cognitive control capacities across the 35 studies included. Additionally, 28 of the 35 studies included only parental self-report of emotional and cognitive control. Conceptually, WM allows a parent to maintain and manipulate information about a

child's learning environment in order to utilize the most appropriate response in the moment; inhibitory control allows a parent to refrain from responding harshly/impulsively to child misbehavior in favor of more effective responses; and attentional control/cognitive flexibility may be necessary for a parent to switch attention between different parenting situations in order to plan and effectively scaffold (Barrett & Fleming, 2011). These cognitive processes may be most directly related to parental scaffolding due in part to the need for parents to consider the child's developmental level while organizing the child's goal-directed activity (which requires planning and WM). Additionally, a parent must be able to adjust a plan in the moment if the chosen strategy is not effectively assisting the child in achieving the goal as intended (which requires cognitive flexibility and initiation/monitoring of tasks). Surprisingly, though these EF components appear to be conceptually linked to effective parental scaffolding, the relation between parent EF and scaffolding has yet to be empirically examined.

Child Effects on Parenting

When examining the relation between parental characteristics and parenting, it is important to consider the bidirectional relationship between parent and child (Johnston et al., 2012; Theule, Wiener, Tannock, & Jenkins, 2013). Deater-Deckard (2014) proposed a heuristic model of the intergenerational transmission and interpersonal processes of self-regulation between parent and child (see Figure 1). In this model, Deater-Deckard proposed that parents influence their children's self-regulation abilities directly through socialization and biological processes. Additionally, Deater-Deckard emphasized that both parents' and children's expressions of emotions and behaviors continuously evoke responses from one another, which are directly influenced by one's own ability to self-

regulate. For example, when a child demonstrates challenging behavior, a parent must call upon his or her own self-regulatory processes to remain calm and implement effective parenting strategies. However, if a parent's self-regulatory processes are not functioning well, a child's difficult or challenging behavior may evoke more reactive behavioral responses from the parent. Therefore, challenging child behavior may moderate the relation between parent EF and parenting response, whereby the relation between parent EF and parenting may be strongest in the context of difficult child behavior (Figure 2).

Importance of Scaffolding for Children with Attention-Deficit/Hyperactivity Disorder (ADHD)

The relation between maternal EF and scaffolding may be particularly important to examine among children with ADHD due to the abundant research suggesting that interactions between children with ADHD and their parents are more negative than interactions between children without ADHD and their parents (Johnston & Chronis-Tuscano, 2014). Indeed, a great deal of evidence suggests that children with ADHD evoke more over-reactive and inconsistent responses from their parents (referred to as "child effects;" Burke, Pardini, & Loeber, 2008). For instance, a series of experimental laboratory studies conducted by Pelham and Lang (1999) demonstrated that parents who interacted with child actors displaying ADHD and oppositional and defiant behaviors reported greater parental hostility, harsher discipline, depression, and stress; displayed physiological stress reactivity; and drank more alcohol following these interactions. Therefore, "child effects" on parents seem to be most pronounced when the child has

disruptive behaviors (i.e., oppositional, defiant, and conduct behaviors) in addition to ADHD (e.g., Johnston & Chronis-Tuscano, 2014; Waschbusch, 2002). Moreover, studies on the effects of stimulant medication have found that when children with ADHD are effectively treated with medication, mothers issue fewer commands and behave more positively toward them (e.g., Barkley, 1988). Based on this experimental research, we can conclude that children with ADHD place greater demands on parents and are more likely to evoke negative parent responses than children without the disorder, particularly when they also display oppositional, defiant, and conduct behaviors.

Research has also shown that biological parents of children with ADHD are more likely to have difficulties with inattention, hyperactivity/restlessness, impulsivity/ emotional lability, and low self-concept relative to parents of children without ADHD (Epstein et al., 2000). Parents of children with ADHD may thus experience greater challenges with scaffolding, both as a result of having a child with ADHD and their own increased risk for EF deficits (Chronis et al., 2003; Faraone & Doyle, 2000) (see Figure 1).

Despite the greater challenges associated with parenting a child with ADHD, parenting quality has been shown to be a particularly significant predictor of developmental outcomes for children with ADHD (e.g., Harvey, Metcalfe, Herbert, & Fanton, 2011). For example, longitudinal studies have shown that over-reactive parenting predicts the development of later oppositional defiant disorder (ODD) symptoms in young children with behavior problems (Harvey et al., 2011). Additionally, hostile parenting predicts the persistence of child ADHD symptoms, even when controlling for genetic influences (Harold et al., 2013). Given that children with the combination of

ADHD and conduct problems are at highest risk for substance abuse and criminal behavior, as well as social and emotional impairments with peers and family, understanding individual differences in parenting quality is an important research agenda which has the potential to mitigate negative developmental outcomes involving high societal cost (Flory, Milich, Lynam, Leukefeld, & Clayton, 2003; Wehmeier, Schacht, & Barkley, 2010).

One type of parenting behavior that may be especially important for children with ADHD and disruptive behaviors is scaffolding. However, to date, the relation between parental scaffolding and child ADHD has been examined in only one study. Winsler (1998) reported that, in a sample of six to eight year old boys, child ADHD was related to poorer parental scaffolding and greater use of parental negative verbal control strategies. Families of children with ADHD are thus an important population in which to examine the relation between parental EF and scaffolding.

Limitations of Current Methods of Assessment

While a few studies have examined the relation between parental EF and parenting, there have been methodological issues that potentially limit what can be learned from these studies. For example, in the few studies to date that have examined parental EF and parenting (Cuevas et al, 2013; Deater-Deckard et al., 2010; 2012), traditional EF tasks were utilized, which may not assess more pertinent aspects relevant to parenting and daily life functioning (Barkley & Murphy, 2010). Historically, EF has been measured with neuropsychological tests administered in the laboratory, including the Wisconsin Card Sorting Task, Stroop, and Digit Span (Frazier, Demaree, &

Youngstrom, 2004). However, these EF tasks have shown poor sensitivity to detecting executive dysfunction (Gregory et al., 2002) and poor ecological validity (Barkley & Murphy, 2011). Traditional EF tasks have shown poor ecological validity since performance on these tasks does not consistently predict how an individual will perform on other EF tasks, self-report EF measures, or more importantly, in real-world situations that tax the EF system (Barkley & Murphy, 2011; Burgess et al., 1998). For instance, Torralva, Gleichgerrcht, Lischinsky, Roca, and Manes (2013) found that adults with high-functioning ADHD (a population characterized by EF deficits) did not perform differently from healthy controls on traditional neuropsychological tests, despite their real-world impairments in time management, organization, problem solving, self-restraint, self-motivation, and emotion regulation (Barkley, 2011). One potential reason why these measures have poor sensitivity to detecting real-world EF deficits is that the examiner provides the structure and organization for these tasks, and monitors the participant's performance during these tasks (Gioia & Isquith, 2004).

Ecologically-Valid Assessment of Executive Functioning

In order to address the limitations of traditional EF tests, researchers have sought to develop laboratory tasks that more closely resemble real-life demands and that tap multiple EF domains simultaneously (Chan et al., 2008, Chaytor, Schmitter-Edgecombe, & Burr, 2006). One model of EF from which newer tasks are being developed is the Supervisory Attentional System (SAS) model (Norman & Shallice, 1986). This model seeks to explain how an individual's contention scheduling and SAS function to activate or suppress thoughts and actions in order to achieve a goal. The contention scheduling

system deals with routine behaviors, which assists in prioritizing the order in which one completes those activities, while the SAS is responsible for regulating non-routine behaviors, which require planning, decision-making, or problem-solving, and possibly changing one's behavior to adapt to a novel situation. The SAS is frequently called upon in everyday parenting situations in which a parent needs to adapt his/her plans and expectations in the moment in order to respond to the child's needs. EF tests based on this SAS model therefore seek to assess components of EF such as strategy allocation in novel situations.

One laboratory task developed using the SAS model is the Hotel Test (Manly et al., 2002). The Hotel Test is an ecologically-valid assessment of individuals' abilities to evaluate, plan, and adapt in a given situation to achieve a "big picture" goal. This task has also shown good sensitivity in detecting EF deficits within high-functioning ADHD participants in comparison to healthy controls, where deficits had previously gone undetected with traditional EF tasks (Torralva et al., 2013). The Hotel Test may be particularly useful in detecting EF deficits specifically related to scaffolding, since effective scaffolding requires parents to evaluate a child's needs, plan the most autonomy-supporting (i.e., least restrictive) approach possible, and then further adapt that plan if the child requires additional support (Hammond et al., 2002).

Additionally, the Barkley Deficits in Executive Functioning Scale (BDEFS; Barkley, 2011) is an ecologically-valid self-report measure for evaluating higher-order dimensions of adult EF that are utilized in daily life, including time management, organization and problem solving, self-restraint, self-motivation, and self-regulation of emotions. The BDEFS has shown good sensitivity in differentiating between ADHD,

clinical, and community control groups; and has shown a non-significant relation with standard EF tests (Barkley, 2011). Furthermore, Barkley and Murphy (2010) showed that the BDEFS was a better predictor of impairments in occupational functioning and major life activities as compared to standard EF tests (including Conners Continuous Performance Test, Stroop Color-Word Test, Wisconsin Card Sort Test, Five-Point Test of Design Fluency, and the Learning and Memory Battery). Utilizing the Hotel Test and BDEFS, as well as a traditional EF assessment (Digit Span) previously shown to relate to harsh parenting behaviors (Deater-Deckard et al., 2010; 2012), should provide a more comprehensive assessment of EF deficits *most relevant* to parenting in mothers with a range of EF abilities.

Current Study

Given the significant role scaffolding plays in child development (Garstein & Fagot, 2003; Hammond et al., 2012), and the central importance of parenting quality in predicting developmental outcomes for children with ADHD (e.g., Harold et al., 2013), it is imperative to understand parent individual difference factors that are associated with effective scaffolding. One parent individual difference factor which has received some research attention, and which may be particularly relevant to families of children with ADHD, is EF. Deficits in EF may impair a parent's ability to successfully manage a child's needs while working towards a goal (Barkley, 2013; Schroeder, & Kelley, 2009). These deficits may be particularly relevant for children with ADHD who themselves require a great deal of external structure and support, have a tendency to evoke negative

responses from caregivers, and whose parents have a greater genetic likelihood of having EF deficits themselves (Epstein et al., 2000).

The limited literature examining associations between maternal EF and parenting (Cuevas et al., 2013; Deater-Deckard et al., 2012) has many methodological limitations, including the sole use of EF tasks with poor ecological validity. Moreover, existing studies focused on a narrow range of parenting skills (primarily harsh/negative parenting), failing to examine more positive aspects of parenting that may tap a parent's EF system (i.e., scaffolding). The proposed study thus seeks to address these limitations by utilizing a multi-method assessment of maternal EF (using both ecologically-valid measures of EF in addition to a traditional EF measure previously shown to be related to parenting) and an observational measure of parental scaffolding to gain a better understanding of the association between maternal EF and scaffolding. Given the importance of effective scaffolding in predicting child developmental outcomes, knowledge gained from this study has the potential to improve the identification of mothers at risk for ineffective scaffolding and inform the development of parenting intervention programs to meet their needs. Furthermore, understanding individual differences in parenting quality is an important research agenda, which has the potential to mitigate child outcomes involving high societal cost (e.g., antisocial behavior). Therefore the proposed study seeks to address the following three aims:

Aims

Aim I: To examine the association between maternal EF (as measured by Hotel Test, BDEFS, and Digit Span) and scaffolding among mothers of children with and without ADHD.

Hypothesis I: We hypothesized that deficits in maternal EF would be negatively associated with observed scaffolding for mothers of children with and without ADHD.

Aim II: To examine the association between child ADHD symptoms and maternal scaffolding.

Hypothesis II: We hypothesized that child ADHD symptoms would be negatively associated with observed scaffolding (Winsler, 1998).

Aim III: To examine the moderating role of child ADHD symptoms on the relation between maternal EF and observed scaffolding, in line with our theoretical model (Figure 1).

Hypothesis III: We hypothesized that child ADHD symptoms would interact with maternal EF deficits to predict the greatest deficits in observed maternal scaffolding. We expected this interaction would be significant due to the child's increased need for external structure/support, tendency to evoke negative responses from caregivers, and greater likelihood of maternal EF deficits.

Exploratory Aim: To examine the unique contribution of each EF measure (Hotel Test, BDEFS, Digit Span) to the prediction of maternal scaffolding.

Exploratory Hypothesis: On one hand, we hypothesized that the Hotel Test and BDEFS would each contribute unique variance to the prediction of maternal scaffolding due to their ecological validity. However, Digit Span has been one of the only EF measures consistently associated with parenting in the literature (Deater-Deckard et al., 2010; 2012) and thus merits examination in this study.

Chapter 2: Method

Participants

The sample consisted of 84 mothers and their 5-10 year-old biological children with (n = 44) and without (n = 40) ADHD. Participants were recruited via mailings and/or presentations to local ADHD advocacy groups, list-servs, public bulletin boards, schools, and health providers in the greater Washington, DC and Baltimore metropolitan areas, Maryland ADHD Program databases, and >14,000 University of Maryland (UMD) employees. We recruited heavily in the area surrounding the university, with the goal of obtaining a socioeconomically and racially diverse group of participants. In order to be able to generalize this study's findings, relatively few restrictions were placed on participant recruitment.

Across both the ADHD and non-ADHD groups, mothers were required to be at least 18 years old and the biological parent of a 5-10 year-old child. The child had to live primarily with their biological mother and have an estimated intelligence quotient (IQ) above 70, using the vocabulary and block design subtests of the Wechsler Intelligence Scale for Children, 4th Ed. (WISC-IV; Wechsler, 2003) or the Wechsler Preschool and Primary Scale of Intelligence, 3rd Ed. (WPPSI-III; Wechsler, 2003) as a screener. For inclusion in the ADHD group, children had to meet DSM-5 criteria for ADHD according to parent reports and parent diagnostic interviews. Children taking stimulant medications were included, but were asked to engage in parent-child interactions while off stimulant medication (whenever possible) to increase variability in difficult behavior during the laboratory Parent-Child Interaction (PCI). Children of mothers in the comparison condition *could not*: (1) meet DSM-5 criteria for ADHD, ODD or conduct disorder (CD)

based on the current assessment; or (2) have ever been diagnosed with, or medicated for, ADHD.

Eighty-eight mother-child dyads completed the assessment. Two families were excluded due to the child not being biologically related to the mother, which was not disclosed until after the families completed the visit. Additionally, two families were excluded due to recording equipment malfunctions, in which the PCI was not recorded, and other measures were not collected (including EF measures). Fourteen children were noted to be taking stimulant medication on the day of the PCI. Participant demographics are presented in Table 1.

Procedures

Mothers expressing interest in the study completed a 10-15 minute telephone screen assessing basic inclusion/exclusion criteria. Mothers meeting basic screening criteria were invited to attend a single two-hour laboratory session at the Maryland ADHD Program with their children. While in the laboratory, mothers completed the ADHD module of the Schedule of Affective Disorders and Schizophrenia for Children (K-SADS; Ambrosini, 2000), a semi-structured diagnostic interview, about their children's behavior. Mothers also completed well-validated rating scales to assess child ADHD, ODD, and CD symptoms as well as resulting impairments in order to classify the children into the ADHD or comparison group. Additionally, mothers completed questionnaires about their own EF. The diagnostic interview was conducted by trained doctoral students in clinical psychology under the supervision of a licensed clinical psychologist. While mothers completed the interview and questionnaires, trained and

closely supervised research assistants completed IQ screening tests with the children to assess eligibility. Questionnaires were completed using Qualtrics, a secure web-based survey software available for use by University of Maryland faculty, students, and staff.

Following the diagnostic interview and child IQ screening tests, mothers participated in a 20-minute laboratory interaction with their child, which was videotaped for later coding and analyses. Mothers then completed the Hotel Test, an ecologically-valid assessment of EF in adults, and a traditional EF test (Digit Span).

All mothers were financially compensated for their participation at the end of the visit in the amount of $25. Additionally, following participation in the study, all mothers were offered to attend a 2-hour Helpful Parenting Tips workshop, which provided an overview of evidence-based parenting strategies, including positive parenting and effective behavior management techniques. Free childcare for the participating child and siblings was provided.

Measures

Child Assessment Measures

Mothers completed the ADHD module of the Schedule for Affective Disorders for School-Aged Children, Fifth Version (K-SADS; Ambrosini, 2000). The K-SADS has shown excellent test-retest reliability (.63 to 1.00) and concurrent validity of screening items and K-SADS diagnoses (Kaufman et al., 1997). Mothers completed the Disruptive Behavior Disorders checklist (DBD; Pelham, Gnagy, Greenslade, & Milich, 1992). On the DBD, the informant indicated the degree to which each symptom of ADHD, ODD, and CD is present, with symptoms rated “pretty much” or “very much” considered

clinically significant (Pelham et al., 1992). This measure has shown good internal consistency (.81 to .96) and predictive validity (.69 to .98; Pelham et al., 1992). ADHD symptoms were considered present if endorsed by the mother as occurring to a clinically significant degree on any of these measures (Piacentini, Cohen, & Cohen, 1992). Total DBD symptoms were calculated by tallying the number of ADHD, ODD, and CD symptoms endorsed by mothers as occurring "pretty much" or "very much" of the time on the DBD. Cross-situational *impairment* necessary for an ADHD diagnosis was evaluated using the parent Impairment Rating Scale *(IRS;* Fabiano et al., 2006), as well as impairment questions following the ADHD K-SADS module. On the IRS, raters assessed impairment and need for treatment across multiple domains. Ratings were made on a 7-point scale, with scores at or above the midpoint indicating significant impairment. This measure has shown good test-retest reliability (.54 to .76), a moderate to high degree of concurrent validity with other impairment rating scales and behavioral measures, and good convergent and discriminant validity (Fabiano et al., 2006).

Observed Maternal Scaffolding

The present study utilized two observational tasks widely employed in research on PCI in families of children with ADHD (e.g., Chronis-Tuscano et al., 2013) that were intended to elicit maternal scaffolding. The observational tasks included: (1) a cleanup/organization task in which clothing, toys, papers, and trash were scattered around the room at age-appropriate levels while the parent was instructed to provide verbal, but not physical assistance (five minutes); and (2) a "homework" task that involved the child completing an age-appropriate math worksheet while the parent was instructed to provide

assistance as they saw fit (10 minutes). The PCI was designed to reflect common tasks that parents and children engage in throughout the day (most of which elicit challenging child behavior and pull for parental scaffolding). We have used this PCI protocol in many NIH-funded ADHD studies conducted with the same age group (Chronis-Tuscano & Clarke, 2008; Chronis-Tuscano et al., 2008; 2013).

Maternal scaffolding was assessed using the Parent Child Interaction System (PARCHISY; Deater-Deckard, 2000; Deater-Deckard, Pylas, & Petrill, 1997), which has been used to evaluate scaffolding in prior research (e.g., Hughes & Ensor, 2009). The PARCHISY is a coding system designed to assess global ratings of parent and child behaviors based on a seven-point Likert-type scale (ranging from 1, *none*, to 7, *very frequent/constant*) across 13 categories of behaviors. Maternal scaffolding was assessed based on a composite of observed global ratings of maternal: positive control (use of praise, explanation, and open-ended questions), positive affect (e.g., smiling, laughing), responsiveness (responsiveness to child's questions, comments, behaviors), and on-task behavior (persistence is with respect to the task that we have given) based on prior studies (Hughes & Ensor, 2009; Mazursky-Horowitz, Bell, & Deater-Deckard, 2015). Coders were trained to 80% reliability and maintained reliability with weekly team coding meetings, where discussion of coding questions took place. Coders also consensus coded weekly, where they coded each task (i.e., clean up and homework) independently and then discussed and resolved any discrepancies of greater than one point on the seven-point scale (Deater-Deckard, 2000). Using this method, prior studies have shown excellent inter-rater reliability ranging from .74 to 1.0 for individual codes (e.g., child

non-compliance and maternal positive control; Deater-Deckard, 2000). For analyses, scaffolding codes were averaged across the cleanup/organization and homework tasks.

Maternal Executive Functioning Measures

Mothers completed three measures of EF in the laboratory. The first measure was the Hotel Test (Manly et al., 2002). In this task, mothers had to complete five tasks needed to run a hotel (i.e., writing out costumer bills, proofreading the hotel leaflet, sorting money from the charity collection, organizing decks of cards from the casino, and alphabetizing conference name labels) in an allotted amount of time (10 minutes) and they had to strategize how to spend their time in order to accomplish the "big picture" goal. This task was introduced with the following instructions: "In this task you have to imagine that you are working in a hotel. Your manager is keen for you to try each of these five everyday activities during the next 10 minutes so that you can get a 'feel' for the work—and make an informed estimate of how long each would take to complete. Your main job is therefore to try to do at least some of all these five tasks over the next 10 min. There are five main tasks to do. Each of the tasks may well take longer than 10 min to complete on its own so there is no way that you will be able to complete them all. The most important thing is to try and do something from each task—spending as much time on each as possible within the total time available." Scoring was based on: (1) the number of tasks mothers attempted accurately (out of five tasks) and (2) the total time deviation between the amount of time they actually spent on each task and the optimal amount of time spent (i.e., two minutes per task) (Torralva et al., 2013). Higher scores refer to a greater time deviation from the optimal amount of time, and therefore poorer

performance. This task has also been described as a more ecologically-valid assessment of EF since it more closely taxes the EF system as it is taxed in daily life (Chan et al., 2008). The Hotel Test has shown good sensitivity in detecting EF deficits among groups of high-functioning and low-functioning clinical groups as well as between clinical groups and healthy controls. This test has also shown good test-retest reliability (Manly et al., 2002; Torralva et al., 2013). Torralva, Roca, Gleichgerrcht, Bekinschtein, and Manes (2009) demonstrated that dementia patients and healthy controls differed significantly in the optimal time deviation. Additionally, Torralva et al. (2013) found that control participants accurately attempted significantly more tasks than did both high functioning and low functioning ADHD participants.

Mothers also completed the Barkley Deficits in Executive Functioning Scale (BDEFS; Barkley, 2011) an 89-item self-report questionnaire assessing deficits in EF in daily life. Mothers were instructed to circle the number next to each item that best described their behavior during the past six months. Every item was assessed based on a four-point Likert-type scale (ranging from 1, *never or rarely*, to 4, *very often)*. The BDEFS has shown good sensitivity by effectively differentiating between ADHD, clinical, and community control groups (Barkley, 2011). Additionally, the BDEFS assessed dimensions of EF that are more commonly seen in daily functioning (e.g., Time Management, Self-Organization, Emotional Self-Control, Self-Restraint, and Self-Motivation) as compared to the lower-level cognitive constructs assessed with traditional EF tests (e.g., inhibition and WM). Examples of items included, “Have trouble motivating myself to start work” (Time-Management), “I don’t seem to process information as quickly or as accurately as others” (Self-Organization), “Likely to do

things without considering the consequences for doing them" (Self-Restraint), "Likely to skip out on work early if my work is boring to do" (Self-Motivation), and "Quick to get angry or become upset" (Emotional Self-Control). This measure has shown good internal consistency (.84 to .96), test-retest reliability (.62 to .90), and discriminant validity (Barkley, 2011).

Mothers also completed a Digit Span test (WAIS-IV, 2008) to assess verbal WM, in which they repeated a sequence of numbers administered by the examiner. The WAIS-IV Digit Span has shown high internal reliability (.70-.90), moderate test-retest reliability (.50-.70) and good sensitivity to detecting verbal WM deficits (Conway et al., 2005; Owen, Lee, & Williams, 2000).

Data Analytic Plan

A series of hierarchical linear regressions were conducted to examine the independent and interactive effects of maternal EF and child ADHD on observed maternal scaffolding, in line with the specific aims (Figure 2). Because "child effects" on parenting appear to be most pronounced when the child has conduct problems in addition to ADHD (e.g., Johnston & Chronis-Tuscano, 2014), both ADHD and DBD symptoms were included in our models rather than ADHD symptoms alone to better account for the additive effects of child ADHD and disruptive behavior on parental scaffolding. Separate analyses were run for each of the maternal EF measures (i.e., Hotel Test time deviation and Hotel Test activities attempted, BDEFS, and Digit Span). Child age and maternal education were both entered in the first step of the regression as control variables since both were correlated with scaffolding in prior studies (e.g., Landry et al., 2001; Neitzel &

Stright, 2004). **Aim 1 and 2:** Both maternal EF and total child ADHD/DBD symptoms were entered separately in the second step of the regression in order to examine the independent main effects of each of these predictor variables on scaffolding, and to determine the unique variance contributed to the prediction of scaffolding above child age and maternal education. **Aim 3:** To examine the moderating role of child ADHD/DBD symptoms on the association between maternal EF and scaffolding, the interaction of maternal EF and child ADHD/DBD symptoms was entered on the last step of the regression (Deater-Deckard et al., 2010). **Exploratory Aims:** Finally, in exploratory analyses, we examined the best single predictor of scaffolding by including all four EF measures as predictors of observed scaffolding in one model. These analyses were conducted using R (R Core Team, 2015).

Since both Digit Span (N = 39) and BDEFS (N = 69) had a number of missing values, we utilized an imputation procedure following Gelman and Hill (2006) in order to limit the effect this missingness would have on our data analytic plan[1]. We first tested to make sure our outcome variable did not differ as a function of missingness, in order to justify that our data were missing at random (a necessary assumption for multiple imputation procedures). We then built two imputation models by regressing the existing values of Digit Span and BDEFS separately onto the other predictors relevant to these analyses: child's age, maternal education, and child ADHD/DBD symptoms. Using these intermediate models, we predicted the missing values of Digit Span and BDEFS based on the existing predictor values for each individual with these missing EF scores.

[1] Results described below were similar when analyses were conducted with both Digit Span and BDEFS prior to imputation.

Chapter 3: Results

Preliminary Analysis

Descriptive data and comparisons between the ADHD and control groups are presented in Table 1. As expected, children in the ADHD group demonstrated significantly more parent-reported ADHD/DBD symptoms and functional impairment. Thirty-one children (37%) met criteria for ADHD-predominantly inattentive presentation; 24 children (29%) met criteria for ADHD-predominantly hyperactive/impulsive presentation; 21 children (25%) met criteria for ADHD-combined presentation; 18 children (22%) had ODD; and 3 children (4%) had CD. Groups were equivalent on demographic characteristics, with the exception of child gender, child age, and maternal education, such that children in the ADHD group were more often male, older, and had mothers with lower educational attainment (Table 1). Additionally, based on prior research demonstrating that scaffolding may look different cross-culturally, maternal race was examined in preliminary analyses (Gauvain, 2005; Rogoff, Mistry, Goncu, & Moiser, 1993). However, scaffolding was not significantly related to maternal race or to child gender in this sample and therefore neither was included in statistical models.

Several associations were found with regard to EF measures (Table 2). The Hotel Test time deviation was positively associated with maternal race (Caucasian); Hotel Test activity attempts was negatively associated with maternal race (African American), and positively associated with maternal race (Caucasian); and BDEFS was positively associated with child ADHD/DBD. Additionally, several associations were found with regard to scaffolding. Specifically, scaffolding was negatively associated with child age, child ADHD/DBD symptoms, and maternal educational attainment of less than college.

Additionally, scaffolding was positively associated with maternal educational attainment of more than college. Only covariates that were associated with the dependent variable (scaffolding) were included in subsequent analyses: maternal education and child age.

Aim I: To examine the association between maternal EF and scaffolding among mothers of children with and without ADHD.

The main effects of maternal EF on scaffolding are presented in Tables 3, 4, 5 and 6. Each table represents a separate hierarchical regression conducted with each maternal EF measure (i.e., Hotel Test time deviation, Hotel Test activity attempts, BDEFS, and Digit Span) as a predictor of observed scaffolding. Child age ($\beta = -.30$, $SE = .10$, $p < .01$), maternal education of less than college ($\beta = .65$, $SE = .30$, $p = .03$), as well as maternal education of more than college ($\beta = .86$, $SE = .27$, $p < .01$) all significantly predicted scaffolding in each model, such that mothers of younger children and mothers with more education demonstrated greater use of scaffolding. This initial step accounted for 22% of the variance in scaffolding in all models. Hotel Test activity attempts and BDEFS were not significant predictors of maternal scaffolding beyond child age, maternal education, and child ADHD/DBD symptoms (Tables 4 and 5). However, Digit Span significantly predicted maternal scaffolding ($\beta = .24$, $SE = .10$, $p = .02$) (Table 6), such that better performance on Digit Span predicted greater use of scaffolding, beyond the effects of child age, maternal education, and child ADHD/DBD symptoms. This second step accounted for an additional 7% of the variance in scaffolding. Additionally, Hotel Test time deviation significantly predicted maternal scaffolding ($\beta = -.21$ $SE = .10$, $p = .04$) (Table 3), such that a smaller Hotel Test time deviation predicted greater use of

scaffolding. This second step accounted for an additional 5% of the variance in scaffolding.

Aim II: To examine the association between child ADHD/DBD symptoms and maternal scaffolding.

The main effects of child ADHD/DBD symptoms on scaffolding are presented in Tables 3, 4, 5 and 6. Contrary to our hypothesis, child ADHD/DBD symptoms did not significantly predict observed maternal scaffolding beyond the effects of child age, maternal education and maternal EF in any of our regression models (with: Hotel Test time deviation: -.19, *SE* = .01, *p* = .09; Hotel Test activity attempts: β = -.17, *SE* = .11, *p* = .14; BDEFS: β = -.14, *SE* = .11, *p* = .23; and Digit Span: β = -.18, SE = .01, p = .10)..

Aim III: To examine the moderating role of child ADHD/DBD symptoms on the relation between maternal EF and observed scaffolding.

Finally, we examined child ADHD/DBD symptoms as a moderator of the association between maternal EF and maternal scaffolding. Results are presented in Tables 3, 4, 5 and 6. Contrary to our hypothesis, there were no significant interactions between any maternal EF measure and child ADHD/DBD symptoms on maternal scaffolding (Hotel Test time deviation: β = -.16, *SE* = .11, *p* = .15; Hotel Test activity attempts: β = .10, *SE* = .12, *p* = .38; BDEFS: β = -.03, *SE* = .08, *p* = .75; and Digit Span β = .02, SE = .09, p = .79).

An alternative model was run to examine the moderating role of maternal EF on the relation between maternal scaffolding and child ADHD/DBD symptoms, consistent with Deater-Deckard et al. (2012) (see Appendix A).

Exploratory Aim: To examine the unique contribution of each maternal EF measure to the prediction of scaffolding.

We conducted an additional regression to determine the best single predictor of scaffolding by including all four EF measures in one model (Table 7). Given limited power, this regression was initially conducted without including covariates, revealing Digit Span as the only significant predictor of maternal scaffolding ($\beta = .10$, $SE = .04$, $p < .01$). However, when child age and maternal education were each included as covariates, trends toward significance were shown for both Digit Span ($\beta = .10$, $SE = .04$, $p = .04$) and Hotel Test time deviation ($\beta = -.07$, $SE = .07$, $p = .35$) in the prediction of scaffolding, consistent with previous models (Table 8).

Chapter 4: Discussion

The current study advances what is known about the independent and interactive links between maternal EF, scaffolding, and child ADHD/DBD symptoms using a multi-method approach. This study yielded several important findings, including that maternal EF, as measured by Digit Span and the Hotel Test time deviation, was predictive of observed maternal scaffolding. Child age and maternal education both significantly predicted maternal scaffolding, replicating past research (Landry et al., 2001; Neitzel & Stright, 2004; Winsler, 1998). However, child ADHD/DBD symptoms did not significantly predict maternal scaffolding beyond the effects of child age, maternal education, and maternal EF; nor did the interaction of maternal EF and child ADHD/DBD symptoms.

As hypothesized, maternal EF (measured by Hotel Test time deviation and Digit Span) was related to maternal scaffolding, such that mothers with better EF demonstrated greater scaffolding during clean up and homework tasks with their children. The Hotel Test required mothers to evaluate the needs of the task (i.e., attempt all five tasks over 10 minutes), plan the most effective approach (i.e., spend two minutes per task), and then consciously shift tasks to meet the goal. Therefore, in line with the SAS model that focuses on strategy allocation in novel situations, the EF skills tapped in this task (i.e., task shifting) may have been particularly relevant to scaffolding, as scaffolding requires parents to evaluate a child's needs in the moment, plan the most autonomy-supportive (i.e., least restrictive) approach possible, and then further adapt that plan if the child requires additional support (Hammond et al., 2002). Additionally, the necessity for mothers to task shift in order to successfully meet the goal of the Hotel Test maps on well

to demands placed on parents who may need to constantly shift between competing demands (e.g., helping with homework, cooking dinner) in a limited amount of time in order to meet a parenting goal (e.g., have their children in bed at an appropriate time). Since parenting involves continually changing competing demands, the SAS system is constantly being tapped, as many parenting situations are novel.

Consistent with prior literature, Digit Span predicted observed scaffolding in the present study beyond stringent controls (Deater-Deckard et al., 2010). While Digit Span has been criticized for having poor sensitivity and poor ecological validity (Barkley & Murphy, 2011; Gregory et al., 2002), it is the only EF measure consistently found to be related to parenting in the literature to date (Deater-Deckard et al., 2010; 2012). Digit Span required mothers to temporarily store and manipulate information (i.e., numbers and letters), without forgetting the most recent list and ignoring potentially distracting information. Digit Span has been conceptualized as a measure of WM capacity, i.e., one's ability to store a specified number of items in memory, while controlling attention (and ignoring irrelevant information) in order to utilize the stored information (Engle, 2002). This may be a particularly relevant skill for mothers attempting to scaffold their children's learning since they need to keep in mind the goals of the learning task and be attentive to their children's developmental needs, while ignoring distractors in the environment.

Contrary to our predictions, the BDEFS did not significantly predict maternal scaffolding in this study. This was a surprising finding as the BDEFS purports to measure higher-order dimensions of adult EF that are utilized in daily life, including time management, organization, problem solving, self-restraint, self-motivation, and self-

regulation of emotions, all of which are theoretically necessary for successful scaffolding (Barkley, 2011). Indeed, the BDEFS has been related to several aspects of real-world functioning in prior studies (Barkley & Murphy, 2010). It is possible that the mothers in our study did not have good insight into their own EF deficits and including a collateral report from a spouse may have yielded different results. However, this is unlikely since mothers of children with ADHD reported significantly higher BDEFS scores (i.e., lower EF) than mothers of children without ADHD. This finding appears to fit well with the literature demonstrating that biological parents of children with ADHD are more likely to have EF deficits themselves (Epstein et al., 2000).

Although child ADHD/DBD symptoms were negatively correlated with maternal scaffolding in preliminary analyses, child ADHD/DBD did not predict maternal scaffolding within our regressions when child age, maternal education, and maternal EF were controlled. This was surprising, as one prior study found that parents of six to eight year old boys with ADHD demonstrated poorer quality scaffolding than parents of boys without ADHD (Winsler, 1998). Our study showed that the age of the child in question and the level of the mother's educational attainment might be more important factors to consider when examining maternal scaffolding behaviors than child ADHD/DBD symptoms alone. Furthermore, the wide age range utilized in the current study may have made it more difficult to observe a significant relation between child ADHD/DBD symptoms and parental scaffolding, as opposed to the Winsler (1998) sample which included a much narrower age range. Focusing on a more narrow age range (during a developmental time period where parental scaffolding is most salient) may further elucidate parental characteristics that are associated with scaffolding. Finally, the absence

of significance may be due to a lack of power given the small sample size.

In our sample, the interaction of child ADHD/DBD symptoms and maternal EF (as measured by Hotel Test, BDEFS, and Digit Span) did not significantly predict maternal scaffolding, contrary to our hypotheses. One would expect moderation effects, given that Neitzel & Stright (2004) found that maternal education moderated the relation between difficult child temperament and maternal cognitive, emotional and autonomy support of children, such that mothers with greater educational attainment increased their use of scaffolding behaviors when they perceived their child as difficult when compared to mothers with less education. However, the current study did not find any moderation effects, which may have been due to a lack of power given the small sample size and numerous covariates added to analyses.

Our study also found that child age was significantly related to maternal scaffolding, such that mothers tended to display more scaffolding with younger children. This fits well with the literature showing that younger children tend to require more support than older children (Landry et al., 2001). As children get older, they may need less support from their parents in completing tasks, such as homework and cleaning up. Maternal education was also significantly related to maternal scaffolding, such that mothers with greater educational attainment demonstrated more scaffolding behaviors. This finding replicated past research showing that higher maternal education was related to a mother's increased use of scaffolding behaviors (Neitzel & Stright, 2004). Neitzel and Stright (2004) speculated that more educated mothers may have additional cognitive resources for managing child behavior and greater knowledge of child development and problem-solving skills, which may allow for greater use of scaffolding behaviors.

Additionally, our sample consisted of a relatively equal number of children with and without ADHD (40 and 44 children respectively). However, due to practical limitations we were unable to match the groups on gender or other socio-demographic variables such as maternal education (see Table 1). The greater proportion of males in the ADHD group was not surprising, as past literature has shown a male to female ratio of 2.3 to one for ADHD in community samples (Bauermeister et al., 2007; Ramtekkar, Reiersen, Todorov, & Todd, 2010). Analyses run with and without child gender as a covariate yielded similar results, but future studies should attempt to match groups on key demographic variables that may relate to parenting. Additionally, some studies have shown that parents may respond to their female and male children differently (e.g., more harsh verbal and physical discipline used with males as compared to females), which further demonstrates the importance of future studies recruiting an even distribution of males and female children across study groups (Mckee et al., 2007).

Also notable was that the BDEFS did not correlate with either of the laboratory EF measures (Digit Span and Hotel Test). This was not surprising, as past literature has demonstrated low agreement between traditional EF tasks and self-report EF measures (Barkley & Murphy, 2011; Burgess et al., 1998). Furthermore, each measure of EF utilized in the current study may have tapped into different components of EF, as opposed to each measure representing one more global EF concept. For example, the Hotel Test may capture a mother's ability to task shift, while the Digit Span may be capturing a mother's WM. This idea fits in well with past research on the concept of "unity and diversity of EF" which states that while various EF components may be correlated with one another, they also represent distinct entities (Miyake, Friedman,

Emerson, Witzki, & Howerter, 2000). Therefore, the results of this study emphasize the need for researchers to examine specific EF components that are conceptually linked to particular parenting behaviors as opposed to examining EF and parenting as broader concepts. Future studies may also benefit from examining results of EF measures in novel ways. For example, while utilizing the Hotel Test, future investigations could go beyond simply examining time spent on each task or counting the number of tasks completed, but also analyze what strategies parents used to allocate attention. Another interesting finding to note is that mothers of children with ADHD did not differ from mothers of children without ADHD on most EF measures, except for the BDEFS. This may be due to the BDEFS measure being the only self-report measure of EF, which may more highly correlate with mothers' self-reports of child ADHD symptoms due to shared method variance.

The current study had several strengths. To our knowledge, this is the first study to examine the relation between maternal EF and maternal scaffolding. Furthermore, it is the first study to examine this relation among children both with and without ADHD. Methodological strengths include using a multi-method assessment of maternal EF as well as an observational measure of maternal scaffolding. By utilizing a multi-method assessment of EF, this study was able to examine the unique contributions of various assessment tools (i.e., an ecologically-valid laboratory task, an ecologically-valid paper-pencil measure, and a traditional laboratory task) and EF skills (i.e., task shifting, higher-order EF abilities, and WM) in the prediction of maternal scaffolding. By utilizing an observational task of maternal scaffolding, this study was also able to control for the potential influences of shared method variance and provide an objective report of

maternal scaffolding behaviors. This study was also able to control for some variables previously reported in the literature to be related to maternal scaffolding (i.e., child age and maternal educational attainment).

Although this study had numerous strengths, these findings must be considered in the context of some limitations. First, this study was likely underpowered to examine the moderating role of child ADHD/DBD symptoms in the relation between maternal EF and scaffolding. Future studies should recruit a larger sample to increase the ability to detect a significant interaction between these variables, allowing us to draw further conclusions about the role of maternal EF and child ADHD/DBD symptoms in predicting maternal scaffolding. Second, with a much larger sample size, it may be possible to match the two groups (i.e., ADHD and non-ADHD children) based on key variables that may be related to scaffolding, such as child age and maternal education. Additionally, although this sample reported earning a wide range of yearly family incomes ($18,000 - $330,000), the mean reported yearly family income was relatively high ($110,877) as compared to the general population in the United States (median family income is $53,657 based on 2014 US census; DeNavas-Walt, Proctor, & Smith, 2014). Third, this study did not include teacher reports of child ADHD symptoms. Evidence-based assessment guidelines encourage both parent and teacher reports of child ADHD symptoms in determining ADHD diagnoses given that to diagnose ADHD, children must demonstrate impairment in at least two contexts (Pelham, Fabiano, & Massetti, 2005). Therefore, future studies may benefit from including teacher report of ADHD symptoms. Finally, this study included a narrow range of observed maternal scaffolding (i.e., 3.63-6.13 on a scale from 0-7), which does not allow for examination of mothers demonstrating very poor

scaffolding. Therefore, future studies should attempt to recruit a larger sample of mothers demonstrating a wider range of scaffolding abilities.

Another limitation of this study is that only mothers were examined. Research has suggested that mothers and fathers interact with their children differently and utilize different parenting strategies in general, including their use of discipline and emotional support (Lewis & Lamb, 2003). However, research has also shown that mothers and fathers do not tend to differ in their use of scaffolding with their two-year-old children during problem-solving and literacy interactions (Conner, 1997). Therefore, future studies should assess father's scaffolding as well, in order to determine if there are important individual differences in maternal and paternal use of scaffolding behaviors, as well as differences in the relation between parental EF and scaffolding in the context of child ADHD. Finally, due to the cross-sectional nature of the study, we were unable to draw causal conclusions regarding the relations and potential influences of maternal EF, child ADHD/DBD symptoms, and maternal scaffolding over time. Future studies may benefit from examining these variables longitudinally in order to better understand how maternal scaffolding changes over time as a function of maternal EF and child ADHD/DBD symptoms and how parental EF and scaffolding may impact child development across childhood, adolescence, and adulthood. Additionally, since there is a genetic component to EF abilities (Friedman et al., 2008), future studies may benefit from examining genetic contributions of parental EF on child outcomes in order to determine if parental scaffolding could impact child outcomes above and beyond the influence of genetics. Finally, as ADHD is highly heritable, examining maternal ADHD symptoms as they relate to parental scaffolding may be an important line of future research in order to

further our understanding of the bidirectional influences parents and children with ADHD have on one another (Faraone & Doyle, 2000).

Given the importance of effective scaffolding in predicting child developmental outcomes, knowledge gained from this study has the potential to improve the identification of mothers at risk for ineffective scaffolding and inform the development and refinement of parenting intervention programs to meet their needs. Specifically, these results suggest that mothers with poorer EF, especially those mothers with lower educational attainment, should be targeted to gain additional support in improving their EF and scaffolding while interacting with their children. Additionally, families may benefit more from already-established evidence-based parenting programs, if supplemental modules targeting maternal EF and/or scaffolding were included. For example, research has shown that mothers of children with ADHD, who have ADHD themselves, benefit less from behavioral parenting programs than mothers without ADHD (Wang, Mazursky-Horowitz, & Chronis-Tuscano, 2014). Thus, adding a module targeting maternal EF (specifically WM and task shifting) in parenting situations (e.g., homework time) may provide these mothers with the additional support necessary to derive more gains from parenting programs.

Table 1
Baseline Demographic and Clinical Characteristics by Child ADHD Status

	Comparison (*n* = 44)	ADHD (*n* = 40)	Total (*n*=84)	Test Statistic	*p*-value
Child Characteristics					
Child Gender *n* (%)				5.56	.02
Male	22 (50.0)	30 (70.0)	52 (61.9)		
Female	22 (50.0)	10 (30.0)	32 (38.1)		
Child Age *M (SD)*	7.0 (1.7)	8.0 (1.6)	7.4 (1.7)	-2.8	.00
Race *n* (%)				2.18	.70
Caucasian	16 (36.4)	16 (40.0)	32 (38.1)		
African-American	9 (20.5)	9 (22.5)	18 (21.4)		
Hispanic or Latino	2 (4.5)	0 (0.0)	2 (2.4)		
Asian	2 (4.5)	1 (2.5)	3 (3.6)		
Multiracial	15 (34.1)	14 (35.0)	29 (34.5)		
Parent Reported Child Symptoms *(SD)*					
ADHD-Inattentive	.80 (1.6)	7.2 (2.3)	3.7 (3.7)	-14.6	.00
ADHD-H/I	1.6 (1.9)	5.8 (2.5)	3.5 (3.0)	-8.4	.00
ODD/CD	.64 (1.5)	3.1 (3.2)	1.8 (2.7)	-4.5	.00
Child Impairment	.66 (1.0)	2.8 (1.1)	1.7 (1.5)	-9.1	.00
Maternal Characteristics					
Married *n* (%)	36 (42.9)	29 (34.5)	65 (77.4)	2.24	.53
Maternal Age *M (SD)*	39.8 (5.8)	40.7 (6.0)	40.2 (5.9)	-.67	.19
Family Income *(SD)*	$119,536.6 (62,561.2)	$101,281.2 (58,896.6)	$110,877.0 (61,148.6)	.005	.94
Race *n* (%)				5.9	.21
Caucasian	21 (47.7)	19 (47.5)	40 (47.6)		
African-American	12 (27.3)	10 (25.0)	22 (26.2)		
Hispanic or Latino	3 (6.8)	0 (0.0)	3 (3.6)		
Asian	5 (11.4)	3 (7.5)	8 (9.5)		
Multiracial	3 (6.8)	8 (20.0)	11 (13.1)		
Maternal Education *n* (%)				18.7	.01
High School or Less	0 (0.0)	5 (12.5)	5 (6.0)		
Some College	1 (2.3)	10 (25.0)	11 (13.1)		
Bachelor's Degree	14 (31.8)	9 (22.5)	23 (27.4)		
Master's Degree	21 (47.7)	12 (30.0)	33 (39.3)		
Doctorate	8 (18.2)	4 (10.0)	12 (14.3)		
Scaffolding *M (SD)*	4.77 (0.34)	4.56 (0.46)	4.67 (0.42)	2.35	.02
Hotel Test time deviation *M (SD)*	313.27 (171.38)	285.55 (158.35)	300.07 (164.90)	.77	.45
Hotel Test activity attempts *M (SD)*	4.23 (1.08)	4.55 (.85)	4.38 (.98)	-1.52	.13
BDEFS *M (SD)*	123.09 (29.00)	149.91 (51.21)	136.70 (43.61)	-2.67	.01
Digit Span *M (SD)*	100.00 (14.24)	99.00 (11.33)	99.51 (12.74)	.24	.81

Note. *M* = Mean; *SD* = Standard Deviation; ADHD = Attention-Deficit/Hyperactivity Disorder; H/I = Hyperactive/Impulsive; CD= Conduct Disorder; and ODD= Oppositional Defiant Disorder

Table 2.

Correlations Between Parent and Child Characteristics and Frequency of Observed Parenting Behavior

	1	2	3	4	5	6	7	8	9	10	11	12
1. Child Gender	1											
2. Child Age	.09	1										
3. Child ADHD/DBD	-.26*	.18	1									
4. Maternal Race (African American)	-.02	.10	-.02	1								
5. Maternal Race (Caucasian)	.03	-.03	.15	-.60**	1							
6. Maternal Education (less than college)	-.05	.16	.38**	.07	-.01	1						
7. Maternal Education (graduate degree)	.13	-.08	-.27**	-.14	.03	-.51**	1					
8. DS	-.06	-.24*	.10	-.06	.16	-.03	.05	1				
9. BDEFS total	-.03	.08	.39**	-.05	.15	.17	.05	.13	1			
10. Hotel Test time deviation	-.04	-.06	-.14	.12	-.30**	.15	-.17	-.38**	-.06	1		
11. Hotel Test attempt	-.07	.04	.19	-.24*	.35**	-.15	.18	.21*	.11	-.77**	1	
12. CU/H scaffold	.04	-.35**	-.29**	-.11	.15	-.35**	.26*	.29**	-.10	-.20	.10	1

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

Note. DBD = Disruptive Behavior Disorders; ADHD = Attention-Deficit/Hyperactivity Disorder; WTAR= Wechsler Test of Adult Reading; DS = Digit Span; BDEFS = Barkley Deficits in Executive Functioning Scale; CU/H = Clean Up/Homework; FT= Free Time.

Table 3
Hierarchical Regression Analysis for Prediction of Scaffolding with Hotel Test time deviation

Variable	d.f.	F	R^2	ΔR^2	SE	b	β
Step 1:	3, 79	7.34	.22				
Child age					.10	-.07**	-.30**
Maternal education (less than college)					.30	.27*	.65*
Maternal education (more than college)					.27	.35**	.86**
Step 2:	5, 77	5.81	.27	.05			
Child ADHD/DBD					.11	-.01	-.19
Hotel Test time deviation					.10	-.00*	-.21*
Step 3:	6, 76	5.26	.29	.02			
Hotel Test time deviation x Child ADHD/DBD					.11	-.00	-.16

N = 84; * p < .05, ** p < .01, *** p< .001
Note. ADHD = Attention-Deficit/Hyperactivity Disorder; DBD = Disruptive Behavior Disorders

Table 4
Hierarchical Regression Analysis for Prediction of Scaffolding with Hotel Test activity attempts

Variable	d.f.	F	R^2	ΔR^2	SE	b	β
Step 1:	3, 79	7.34	.22				
Child age					.10	-.07**	-.30**
Maternal education (less than college)					.30	.27*	.65*
Maternal education (more than college)					.27	.35**	.86**
Step 2:	5, 77	4.92	.24	.02			
Child ADHD/DBD					.11	-.01	-.17
Hotel Test activity attempts					.11	.04	.10
Step 3:	6, 76	4.2	.25	.01			
Hotel Test activity attempts x Child ADHD/DBD					.11	.00	.10

N = 84; * p < .05, ** p < .01, *** p< .001
Note. ADHD = Attention-Deficit/Hyperactivity Disorder; DBD = Disruptive Behavior Disorders

Table 5
Hierarchical Regression Analysis for Prediction of Scaffolding with BDEFS

Variable	d.f.	F	R^2	ΔR^2	SE	b	β
Step 1:	3, 79	7.34	.22				
Child age					.10	-.07**	-.30**
Maternal education (less than college)					.30	.27*	.65*
Maternal education (more than college)					.27	.35**	.86**
Step 2:	5, 77	4.70	.23	.01			
Child ADHD/DBD					.10	-.01	-.14
BDEFS					.11	.00	.01
Step 3:	6, 76	3.9	.24	.01			
BDEFS x Child ADHD/DBD					.08	-.00	-.03

N = 84; * p < .05, ** p < .01, *** p< .001
Note. ADHD = Attention-Deficit/Hyperactivity Disorder; DBD = Disruptive Behavior Disorders

Table 6
Hierarchical Regression Analysis for Prediction of Scaffolding with Digit Span

Variable	d.f.	F	R^2	ΔR^2	SE	b	β
Step 1:	3, 79	7.34	.22				
Child age					.10	-.07**	-.30**
Maternal education (less than college)					.30	.27*	.65*
Maternal education (more than college)					.27	.35**	.86**
Step 2:	5, 77	6.23	.29	.07*			
Child ADHD/DBD					.11	-.01	-.18
Digit Span					.10	.01*	.24*
Step 3:	6, 76	5.15	.29	.00			
Digit Span x Child ADHD/DBD					.09	-.00	.02

N = 84; * p < .05, ** p < .01, *** p< .001
Note. ADHD = Attention-Deficit/Hyperactivity Disorder; DBD = Disruptive Behavior Disorders

Table 7

Linear Regression Analysis for Prediction of Scaffolding with Hotel Test time deviation, Hotel Test activity attempts, BDEFS, and Digit Span (not including covariates)

Variable	d.f.	F	R^2	SE	b	β
	4, 78	3.53	.15			
Hotel Test time deviation				.07	-.16	-.07
Hotel Test activities attempted				.07	-.07	-.03
BDEFS				.04	-.13	-.06
Digit Span				.04	.26*	.10*

N = 84; * p < .05, ** p < .01, *** p< .001

Note. BDEFS = Barkley Deficits in Executive Functioning Scale

Table 8

Linear Regression Analysis for Prediction of Scaffolding with Hotel Test time deviation, Hotel Test activity attempts, BDEFS, and Digit Span (including covariates)

Variable	d.f.	F	R^2	SE	b	β
	7, 75	4.14	.28			
Hotel Test time deviation				.09	-.00	-.08
Hotel Test activities attempted				.06	-.05	-.13
BDEFS				.04	-.00	-.02
Digit Span				.04	.01.	.06
Child age				.04	-.06*	-.10*
Maternal education (less than college)				.12	.25.	.24
Maternal education (more than college)				.11	.33**	.11**

Note. N = 84; . p < .1, * p < .05, ** p < .01, *** p < .001

Note. BDEFS = Barkley Deficits in Executive Functioning Scale

Figure 1. Heuristic Model

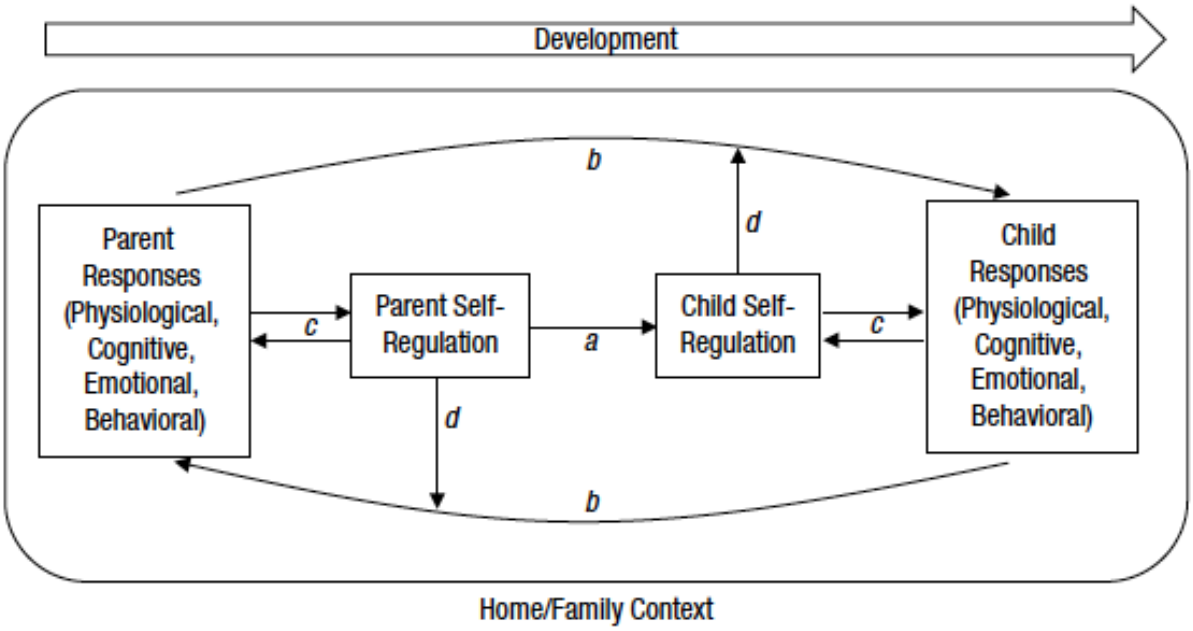
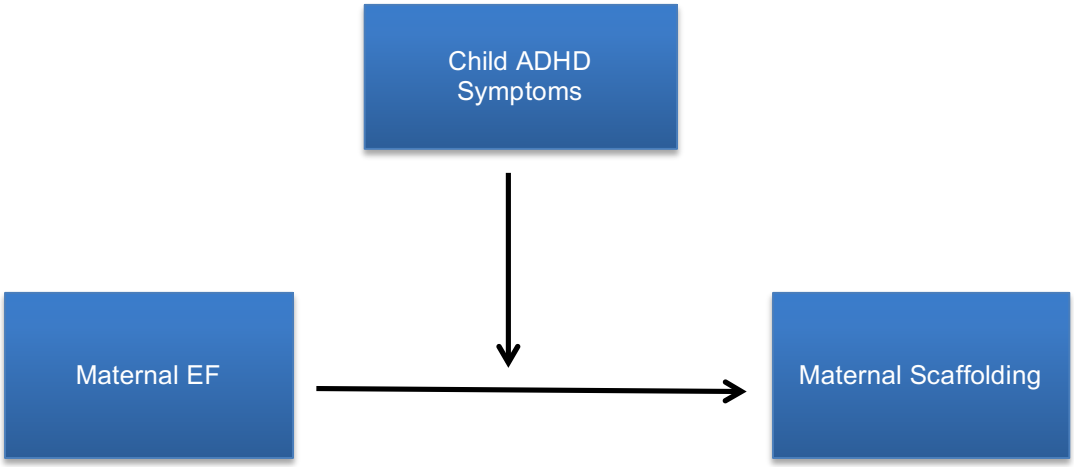


Fig. 1. Heuristic model of intergenerational transmission and interpersonal processes of self-regulation. Self-regulation capacities, including those attributable to executive function and well-regulated attentive behavior, develop in systematic ways over the course of childhood into adulthood. Parents transmit self-regulation to their children directly through interacting socialization and biological mechanisms (a). In addition, parents' and children's verbal and nonverbal emotional and behavioral responses evoke responses in each other (b). These responses are directly related to (c) and moderated by (d) self-regulation of thoughts, emotions, and behaviors. These dyadic and intergenerational transmission processes change as a function of development of both individuals and their relationships, and are altered by contextual features of the broader family and home context (e.g., socioeconomic risks, household chaos, cultural factors).

Note. Heuristic model of intergenerational transmission and interpersonal processes of self-regulation. Reprinted from "Family Matters: Intergenerational and Interpersonal Processes of Executive Function and Attentive Behavior," by K. Deater-Deckard, 2014, *Current Directions in Psychological Science, 23,* p.231. Copyright 2014 by Sage Publications. Adapted with permission.

Figure 2. Conceptual Model



Appendices

Appendix A. Alternative Moderation Model

As follow up analyses, we ran an alternative model in line with Deater-Deckard et al.'s (2012) paper, to examine the moderating role of maternal EF on the relation between observed scaffolding and child ADHD/DBD symptoms. We hypothesized that poor maternal EF would interact with maternal scaffolding to predict child ADHD/DBD symptoms, such that poor maternal EF and low scaffolding would predict the highest levels of child ADHD/DBD symptoms.

A series of hierarchical linear regressions were conducted to examine the independent and interactive effects of maternal EF and observed maternal scaffolding on child ADHD/DBD symptoms. Separate analyses were run for each of the maternal EF measures (i.e., Hotel Test time deviation and Hotel Test activities attempted, BDEFS, and Digit Span). Child gender and maternal education were both entered in the first step of the regressions as control variables, since both were correlated with child ADHD/DBD symptoms in our sample.

We found that maternal education predicted child ADHD/DBD symptoms, such that more educated mothers reported having children with fewer ADHD/DBD symptoms ($\beta = -8.50$, $SE = 2.29$, $p < .001$) (Tables 1-4). Additionally, we found that child gender predicted child ADHD/DBD symptoms, such that boys were reported to have greater ADHD/DBD symptoms than girls ($\beta = -4.13$, $SE = 1.74$, $p < .05$). Also, Hotel Test Activity Attempts ($\beta = 2.16$, $SE = .84$, $p < .05$) and BDEFS ($\beta = .07$, $SE = .02$, $p < .001$) predicted child ADHD/DBD symptoms (Tables 2 and 4 respectively), such that more activity attempts on the Hotel Test and greater self-reported EF deficits on the BDEFS predicted higher child ADHD/DBD symptoms. Finally, we found that maternal EF, as measured by only the Hotel Test time deviation (Table 1), moderated

the relation between observed maternal scaffolding and child ADHD/DBD symptoms ($\beta = -.03$, $SE = .01$, $p < .05$). More specifically, we found that for mothers with high levels of EF (+1 SD), the amount of observed maternal scaffolding had no significant impact on the number of child ADHD/DBD symptoms reported. However, for mothers with poor EF (-1 SD) (Aiken & West, 1991), child ADHD/DBD symptoms decreased as mothers engaged in more scaffolding (Figure 1).

Our finding that more educated mothers reported having children with fewer ADHD/DBD symptoms fits well with past literature showing similar results (Harrison & Sofronoff, 2002). Also, our finding that being male was predictive of greater ADHD/DBD symptoms was expected, given that past literature has shown a male to female ratio of 2.3 to one for ADHD in community samples (Bauermeister et al., 2007; Ramtekkar et al., 2010) and that ADHD girls have shown lower ratings on hyperactivity, inattention, impulsivity, and externalizing problems as compared to ADHD boys (Gershon, 2002). Additionally, results showing that greater maternal EF deficits (as measured by the BDEFS) predicted greater child ADHD/DBD symptoms, fits in well with the literature demonstrating that parents of children with ADHD have a greater genetic likelihood of having EF deficits themselves (Epstein et al., 2000). However, in this study, more Hotel Test activity attempts (indicative of better maternal EF) predicted greater reported child ADHD/DBD symptoms. This result is surprising as we would expect better maternal EF would be predictive of fewer child ADHD/DBD symptoms (Epstein et al., 2000). Another surprising finding was that mothers with high EF (based on Hotel Test time deviation) reported relatively higher child ADHD/DBD symptoms (Figure 1). Given that both ADHD and EF are highly heritable, we would expect that mothers with better EF

would have children with fewer reported ADHD/DBD symptoms (Faraone & Doyle, 2000; Friedman et al., 2008).

Our study also found that maternal EF, as measured by only the Hotel Test time deviation, moderated the relation between observed maternal scaffolding and child ADHD/DBD symptoms, such that child ADHD/DBD symptoms decreased as mothers engaged in more scaffolding, only for mothers with poor EF. These results fit nicely with the literature on differential susceptibility, which purports that children who are the most vulnerable (i.e., children of mothers with poor EF in this case) are the ones that are most adversely impacted by stressors, but also benefit the most from environmental supports (i.e., scaffolding in this case) (Belsky & Pluess, 2009). Additionally, for those families where mothers have higher EF, scaffolding may not predict child ADHD/DBD symptoms as those children may have higher EF as well (given the strong genetic component of EF; Friedman et al., 2008) and therefore may not need as much scaffolding to be successful. This interaction is in line with Deater-Deckard et al.'s (2012) paper, such that parenting was related to child behavior only for mothers with poorer EF.

Targeting maternal scaffolding in parent training programs may therefore be the most effective way to impact child behavior, specifically for mothers with poor EF. However, as the various EF measures yielded different results in this study, findings should be interpreted with caution and replicated in larger samples. Additionally, as each EF measure utilized in this study tapped different EF abilities, it may be important to examine specific EF abilities (e.g., task shifting, WM, higher order EF abilities) more closely when predicting child behavioral outcomes.

Appendix A Table 1

Hierarchical Regression Analyses for Prediction of Child ADHD/DBD Symptoms with Hotel Test Time Deviation

Variable	d.f.	F	R^2	ΔR^2	SE	b	β
Step 1:	3, 79	7.01	.21				
Child gender					1.74	-4.13*	-.49*
Maternal education (less than college)					2.54	-7.29**	-.86**
Maternal education (more than college)					2.29	-8.50***	-1.00***
Step 2:	5, 77	6.42	.29	.08*			
Scaffolding					2.14	-4.34*	-.21*
Hotel Test time deviation					.01	-.01*	-.25*
Step 3:	6, 76	6.54	.34	.05*			
Hotel Test time deviation x Scaffolding					.01	-.03*	-.24*

N = 84; * p < .05, ** p < .01, *** p< .001

Note. ADHD = Attention-Deficit/Hyperactivity Disorder; DBD = Disruptive Behavior Disorders

Appendix A Table 2

Hierarchical Regression Analyses for Prediction of Child ADHD/DBD Symptoms with Hotel Test Activity Attempts

Variable	d.f.	F	R^2	ΔR^2	SE	b	β
Step 1:	3, 79	7.01	.21				
Child gender					1.74	-4.13*	-.49*
Maternal education (less than college)					2.54	-7.29**	-.86**
Maternal education (more than college)					2.29	-8.50***	-1.00**
Step 2:	5, 77	6.45	.30	.09*			
Scaffolding					2.12	-3.72	-.18
Hotel Test Activity Attempts					.84	2.16*	.25*
Step 3:	6, 76	5.36	.30	.00			
Hotel Test Activity Attempts x Scaffolding					2.13	.95	.05

N = 84; * p < .05, ** p < .01, *** p< .001

Note. ADHD = Attention-Deficit/Hyperactivity Disorder; DBD = Disruptive Behavior Disorders

Appendix A Table 3

Hierarchical Regression Analyses for Prediction of Child ADHD/DBD Symptoms with Digit Span

Variable	d.f.	F	R^2	ΔR^2	SE	b	β
Step 1:	3, 79	7.01	.21				
Child gender					1.74	-4.13*	-.49
Maternal education (less than college)					2.54	-7.29**	-.86
Maternal education (more than college)					2.29	-8.50***	-1.00
Step 2:	5, 77	5.33	.26	.05			
Scaffolding					2.28	-4.52	-.22
Digit Span					.09	.14	.16
Step 3:	6, 76	4.39	.26	.00			
Digit Span x Scaffolding					.24	.05	.02

N = 84; * p < .05, ** p < .01, *** p< .001

Note. ADHD = Attention-Deficit/Hyperactivity Disorder; DBD = Disruptive Behavior Disorders

Appendix A Table 4

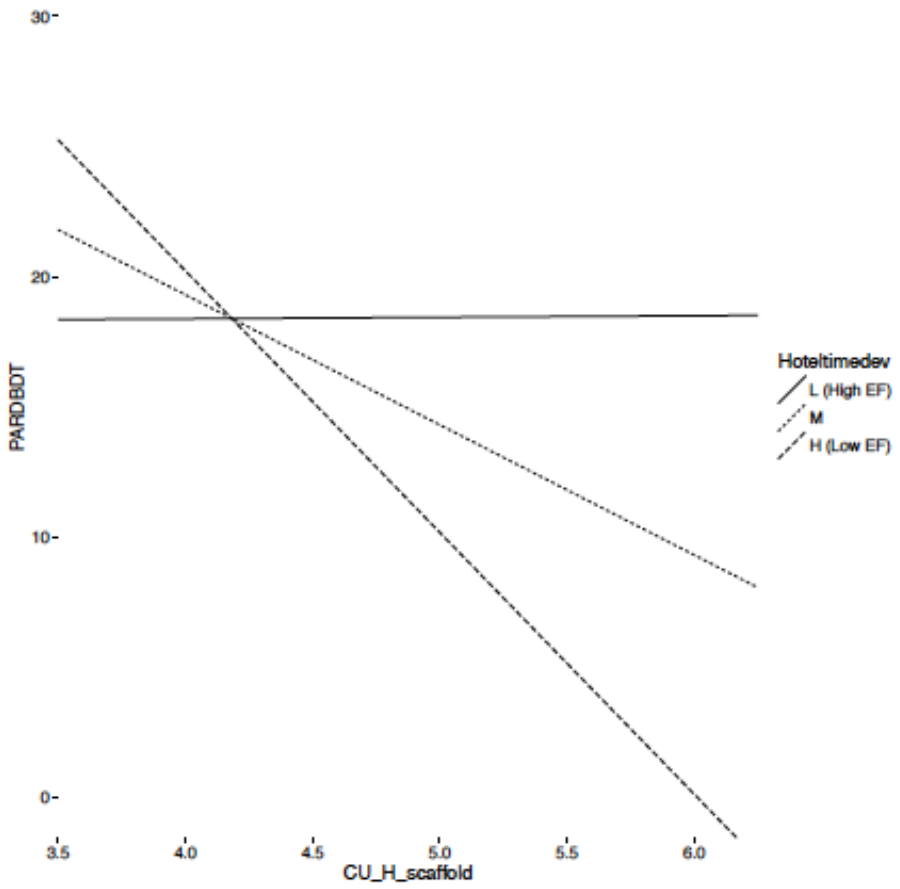
Hierarchical Regression Analyses for Prediction of Child ADHD/DBD Symptoms with BDEFS

Variable	d.f.	F	R^2	ΔR^2	SE	b	β
Step 1:	3, 79	7.01	.21				
Child gender					1.74	-4.13*	-.49*
Maternal education (less than college)					2.54	-7.29**	-.86**
Maternal education (more than college)					2.29	-8.50***	-1.00***
Step 2:	5, 77	8.05	.34	.13***			
Scaffolding					2.05	-3.09	-.15
BDEFS					.02	.07***	.34***
Step 3:	6, 76	6.62	.34	.00			
BDEFS x Scaffolding					.05	.00	.00

N = 84; * p < .05, ** p < .01, *** p< .001

Note. ADHD = Attention-Deficit/Hyperactivity Disorder; DBD = Disruptive Behavior Disorders; BDEFS = Barkley Deficits in Executive Functioning Scale

Appendix A Figure 1. Interaction between maternal scaffolding and maternal EF in predicting child ADHD/DBD symptoms



Note. ADHD = Attention-Deficit/Hyperactivity Disorder; DBD = Disruptive Behavior Disorders; EF = Executive Functioning

Appendix B. Schedule for Affective Disorders for School-Aged Children, Fifth Version

Determine the age of onset for first positively endorsed ADHD symptom. If symptom has persisted since early childhood, use the current rating to describe the symptom's most intense severity over the past year. Score symptom as 'not present' in the past unless prior episode of symptomatology was followed by a period of six months or more in which the child was free of ADHD problems.

If onset of symptoms is after age 8, be careful to assess other disorders, e.g., mood disorders/anxiety disorders.

Compared to other children/adolescents this age, how would parent/adult rate this child/adolescent. Also ask if teachers or others have complained about particular symptoms or behaviors.

If the symptoms are episodic, consider the presence of a mood disorder or other causes (e.g., alcohol, drugs or medical problems).

If the child is being treated with stimulants, rate for most severe period prior to medication or during drug holidays and note in margin which symptoms are improved with medication.

Probe: For how long has _____ been a problem? Has it been a problem since kindergarten? First grade? Did the problem start even earlier?

	P	C	S	
1. Difficulty Sustaining Attention on Tasks or Play Activities	( )	( )	( )	**0** - No information.
	( )	( )	( )	**1** - Not present.
Has there ever been a time when you had trouble paying attention in school? Did it affect your school work? Did you get into trouble because of this? When you were working on your homework, did your mind wander? What about when you were playing games? Did you forget to go when it was your turn? Did teachers complain?	( )	( )	( )	**2** - Subthreshold: Occasionally has difficulty sustaining attention on tasks or play activities. Problem has only minimal effect on functioning.
NOTE: RATE BASED ON DATA REPORTED BY INFORMANT (e.g., parent or teacher) OR OBSERVATIONAL DATA. DO NOT RATE POSITIVELY IF OCCURS ONLY DURING MOOD EPISODE.	( )	( )	( )	**3** - Threshold: Often (4-7 days/week) has difficulty sustaining attention. Problem has significant effect on functioning.
				PAST: ☐ P ☐ C ☐ S

	P	C	S	
2. Easily Distracted	( )	( )	( )	**0** - No information.
	( )	( )	( )	**1** - Not present.
Was there ever a time when little distractions would make it very hard for you to keep your mind on what you were doing? Like if another kid in class asked the teacher a question while the class was working quietly, was it hard for you to keep your mind on your work? When there was an interruption, like when the phone rang, was it hard to get back to what you were doing before the interruption? Were there times when you could keep your mind on what you were doing, and little noises and things didn't bother you? How often were they a problem? Did teachers complain?	( )	( )	( )	**2** - Subthreshold: Occasionally distractible. Problem has only minimal effect on functioning.
NOTE: RATE BASED ON DATA REPORTED BY INFORMANT OR OBSERVATIONAL DATA. DO NOT RATE POSITIVELY IF OCCURS ONLY DURING MOOD EPISODE.	( )	( )	( )	**3** - Threshold: Attention often (4-7 days/week) disrupted by minor distractions other kids would be able to ignore. Problem has significant effect on functioning.
				PAST: ☐ P ☐ C ☐ S

	P	C	S	
3. Difficulty Remaining Seated	( )	( )	( )	**0** - No information.
Was there ever a time when you got out of your seat a lot at school? Did you get into trouble for this? Was it hard to stay in your seat at school? What about dinner time?	( )	( )	( )	**1** - Not present.
Parents: *When your child was young, were you able to take him/her to church? Restaurants? Were these difficulties beyond what you would expect for a child his/her age?*	( )	( )	( )	**2** - Subthreshold: Occasionally has difficulty remaining seated when required to do so. Problem has only minimal effect on functioning.
NOTE: RATE BASED ON DATA REPORTED BY INFORMANT OR OBSERVATIONAL DATA.	( )	( )	( )	**3** - Threshold: Often (4-7 days/week) has difficulty remaining seated when required to do so. Problem has significant effect on functioning.
Take into account that these symptoms tend to improve with age. Carefully check if this symptom was present when the child was younger.				**PAST:** ☐ P ☐ C ☐ S

	P	C	S	
4. Impulsivity	( )	( )	( )	**0** - No information.
Do you act before you think, or think before you act? Has there ever been a time when these kinds of behaviors got you into trouble? Give some examples.	( )	( )	( )	**1** - Not present.
(THIS ITEM IS NOT A DSM-IV CRITERION - DO NOT INCLUDE IN SYMPTOM COUNT)	( )	( )	( )	**2** - Subthreshold: Occasionally impulsive. Problem has only minimal effect on functioning.
	( )	( )	( )	**3** - Threshold: Often (4-7 days/week) impulsive. Problem has significant effect on functioning.
				PAST: ☐ P ☐ C ☐ S

— **IF RECEIVED A SCORE OF 3 ON THE CURRENT RATINGS OF ANY OF THE PREVIOUS ITEMS, COMPLETE THE ATTENTION DEFICIT HYPERACTIVITY DISORDER (CURRENT) SECTION IN THE BEHAVIORAL DISORDERS SUPPLEMENT AFTER COMPLETING THE SCREEN INTERVIEW.**

— **IF RECEIVED A SCORE OF 3 ON THE PAST RATINGS OF ANY OF THE PREVIOUS ITEMS, COMPLETE THE ATTENTION DEFICIT HYPERACTIVITY DISORDER (PAST) SECTION IN THE BEHAVIORAL DISORDERS SUPPLEMENT AFTER COMPLETING THE SCREEN INTERVIEW.**

— **NO EVIDENCE OF ATTENTION DEFICIT DISORDER.**

NOTE: (RECORD DATES OF POSSIBLE CURRENT AND PAST ATTENTION DEFICIT HYPERACTIVITY DISORDER).

(If child is on medication for ADHD, rate behavior when not on medication)

NOTE: DO NOT RATE SYMPTOMS POSITIVELY IF THEY ARE EXCLUSIVELY ACCOUNTED FOR BY MDE, BIPOLAR DISORDER, DYSTHYMIA, SUBSTANCE ABUSE, PSYCHOSIS, OR PDD.

1. Makes a lot of Careless Mistakes

Do you make a lot of careless mistakes at school?
Do you often get problems wrong on tests because you didn't read the instructions right?
Do you often leave some questions blank by accident?
Forget to do the problems on both sides of a handout?
How often do these types of things happen?
Has your teacher ever said you should pay more attention to detail?

P	C	S	
( )	( )	( )	**0** - No Information.
( )	( )	( )	**1** - Not Present.
( )	( )	( )	**2** - Subthreshold: Occasionally makes careless mistakes. Problem has only minimal effect on functioning.
( )	( )	( )	**3** - Threshold: Often (4-7 days/week) makes careless mistakes. Problem has significant effect on functioning.

PAST: ☐ P ☐ C ☐ S

2. Doesn't Listen

Is it hard for you to remember what your parents and teachers say?
Do your parents or teachers complain that you don't listen to them when they talk to you?
Do you "tune people out"?
Do you get into trouble for not listening?

Rate based on data reported by informant or observational data.

P	C	S	
( )	( )	( )	**0** - No Information.
( )	( )	( )	**1** - Not Present.
( )	( )	( )	**2** - Subthreshold: Occasionally doesn't listen. Problem has only minimal effect on functioning.
( )	( )	( )	**3** - Threshold: Often (4-7 days/week) doesn't listen. Problem has significant effect on functioning.

PAST: ☐ P ☐ C ☐ S

3. Difficulty Following Instructions

Do your teachers complain that you don't follow instructions?
When your parents or your teacher tell you to do something, is it sometimes hard to remember what they said to do?
Does it get you into trouble?
Do you lose points on your assigments for not following directions or not completing the work?
Do you forget to do your homework or forget to turn it in?
Do you get in to trouble at home for not finishing your chores or other things your parents ask you to do? How often?

P	C	S	
( )	( )	( )	**0** - No Information.
( )	( )	( )	**1** - Not Present.
( )	( )	( )	**2** - Subthreshold: Occasionally has difficulty following instructions. Problem has only minimal effect on functioning.
( )	( )	( )	**3** - Threshold: Often (4-7 days/week) has difficulty following instructions. Problem has significant effect on functioning.

PAST: ☐ P ☐ C ☐ S

	P	C	S	
4. Difficulty Organizing Tasks	( )	( )	( )	**0** - No Information.
Is your desk or locker at school a mess?	( )	( )	( )	**1** - Not Present.
Does it make it hard for you to find the things you need? *Does your teacher complain that your assignments are messy or disorganized?*	( )	( )	( )	**2** - Subthreshold: Occasionally disorganized. Problem has only minimal effect on functioning.
When you do your worksheets, do you usually start at the beginning and do all the problems in order, or do you like to skip around? *Do you often miss problems?* *Do you have a hard time getting ready for school in the morning?*	( )	( )	( )	**3** - Threshold: Often (4-7 days/week) disorganized. Problem has significant effect on functioning.

PAST: ☐ P ☐ C ☐ S

	P	C	S	
5. Dislikes/Avoids Tasks Requiring Attention	( )	( )	( )	**0** - No Information.
Do you hate or dislike doing things that require a lot of concentration/effort? *Like certain assignments, homework or reading a book?* *Are there some kinds of school work you hate doing more than others? Which ones? Why?* *Do you try to get out of doing your ___ assignments?* *About how many times a week do you not do your ___ homework?*	( )	( )	( )	**1** - Not Present.
	( )	( )	( )	**2** - Subthreshold: Occasionally avoids tasks that require sustained attention, and/or expresses mild dislike for these tasks. Problem has only minimal effect on functioning.
NOTE: IN CHILDREN/TEENS WITH ADHD, ABILITY TO SUSTAIN ATTENTION TO VERY REWARDING ACTIVITES LIKE COMPUTER OR VIDEO GAMES MAY NOT BE IMPAIRED.	( )	( )	( )	**3** - Threshold: Often (4-7 days/week) avoids tasks that require sustained attention, and/or expresses moderate dislike for these tasks. Problem has significant effect on functioning.

PAST: ☐ P ☐ C ☐ S

	P	C	S	
6. Loses Things	( )	( )	( )	**0** - No Information.
Do you lose things a lot? Your pencils at school? Homework assignments? Things around home? *About how often does this happen?*	( )	( )	( )	**1** - Not Present.
	( )	( )	( )	**2** - Subthreshold: Occasionally loses things. Problem has only minimal effect on functioning.
	( )	( )	( )	**3** - Threshold: Often loses things (e.g. once a week or more). Problem has significant effect on functioning.

PAST: ☐ P ☐ C ☐ S

	P	C	S	
7. Forgetful in Daily Activities	( )	( )	( )	**0** - No Information.
	( )	( )	( )	**1** - Not Present.
	( )	( )	( )	**2** - Subthreshold: Occasionally forgetful. Problem has only minimal effect on functioning.
	( )	( )	( )	**3** - Threshold: Often (4-7 days/week) forgetful. Problem has significant effect on functioning.

Do you often leave your homework at home, or your books or coats on the bus?
Do you leave your things outside by accident?
How often do these things happen?
Has anyone ever complained that you are too forgetful?

PAST: ☐ P ☐ C ☐ S

	P	C	S	
8. Fidgets	( )	( )	( )	**0** - No Information.
	( )	( )	( )	**1** - Not Present.
	( )	( )	( )	**2** - Subthreshold: Occasionally fidgets with hands or feet or squirms in seat. Problem has only minimal effect on functioning.
	( )	( )	( )	**3** - Threshold: Often (4-7 days/week) fidgets with hands or feet or squirms in seat. Problem has significant effect on functioning.

Consider restlessness, tapping fingers, chewing things, squirming, "ants in pants", etc.

Do people often tell you to sit still, to stop moving, or stop squirming in your seat? Your teachers? Parents?
Do you sometimes get into trouble for squirming in your seat or playing with little things at your desk?
Do you have a hard time keeping your arms and legs still? How often?

For parents about children: *When you take your child to church or to a restaurant, do you have to bring a lot of games or toys?*
About adolescents: *When your child was younger, were you able to take him/her to church? Restaurants?*
Were these difficulties beyond what you would expect for a child his/her age?

PAST: ☐ P ☐ C ☐ S

Take into account that these symptoms tend to improve with age. Carefully check if this symptom was present when the child was younger.

NOTE: RATE BASED ON DATA REPORTED BY INFORMANT OR OBSERVATIONAL DATA.

	P	C	S	
9. Runs or Climbs Excessively	( )	( )	( )	**0** - No Information.
	( )	( )	( )	**1** - Not Present.
	( )	( )	( )	**2** - Subthreshold: Occasionally runs about or climbs excessively. Problem has only minimal effect on functioning. (In adolescents, may be limited to a subjective feeling of restlessness)
	( )	( )	( )	**3** - Threshold: Often (4-7 days/week) runs about or climbs excessively. Problem has significant effect on functioning. (In adolescents, may be limited to a subjective feeling of restlessness)

Do you get into trouble for running down the hall in school?
Does your mom often have to remind you to walk instead of run when you are out together?
Do your parents or your teacher complain about you climbing things you shouldn't?
What kinds of things? How often does this happen?

Adolescents: *Do you feel restless a lot? Feel like you have to move around, or that it is very hard to stay in one place?*

Rate based on data reported by informant (parent/teacher) or observational data.

PAST: ☐ P ☐ C ☐ S

	P	C	S	
10. On the Go/Acts like Driven by Motor	( )	( )	( )	**0** - No Information.
Do people tell you that your motor is always running?	( )	( )	( )	**1** - Not Present.
Is it hard for you to slow down?	( )	( )	( )	**2** - Subthreshold: Occasionally, minimal effect on functioning.
Can you stay in one place for long, or are you always on the go?				
How long can you sit and watch TV or play a game?	( )	( )	( )	**3** - Threshold: Often (4-7 days/week) acts as if "driven by a motor." Significant effect on functioning.
Do people tell you to slow down a lot?				
				PAST: ☐ P ☐ C ☐ S

	P	C	S	
11. Difficulty Playing Quietly	( )	( )	( )	**0** - No Information.
Do your parents or teachers often tell you to quiet down when you are playing?	( )	( )	( )	**1** - Not Present.
Do you have a hard time playing quietly?	( )	( )	( )	**2** - Subthreshold: Occasionally has difficulty playing quietly. Problem has only minimal effect on functioning.
	( )	( )	( )	**3** - Threshold: Often (4-7 days/week) has difficulty playing quietly. Problem has significant effect on functioning.
				PAST: ☐ P ☐ C ☐ S

	P	C	S	
12. Blurts Out Answers	( )	( )	( )	**0** - No Information.
At school, do you sometimes call out the answers before you are called on?	( )	( )	( )	**1** - Not Present.
Do you talk out of turn at home?				
Answer questions your parents ask your siblings? How often?	( )	( )	( )	**2** - Subthreshold: Occasionally talks out of turn. Problem has only minimal effect on functioning.
	( )	( )	( )	**3** - Threshold: Often (4-7 days/week) talks out of turn. Problem has significant effect on functioning.
				PAST: ☐ P ☐ C ☐ S

	P	C	S	
13. Difficulty Waiting Turn	( )	( )	( )	**0** - No Information.
Is it hard for you to wait your turn in games?	( )	( )	( )	**1** - Not Present.
What about in line in the cafeteria or at the water fountain?	( )	( )	( )	**2** - Subthreshold: Occasionally has difficulty waiting his/her turn. Problem has only minimal effect on functioning.
	( )	( )	( )	**3** - Threshold: Often (4-7 days/week) has difficulty waiting his/her turn. Problem has significant effect on functioning.
				PAST: ☐ P ☐ C ☐ S

14. Interrupts or Intrudes

Do you get into trouble for talking out of turn at school?
Do your parents, teachers, or any of the kids you know complain that you cut them off when they are talking?
Do kids complain that you break in on games? Does this happen a lot?

Rate based on data reported by informant (parent/teacher) or observational data.

P	C	S	
( )	( )	( )	**0** - No Information.
( )	( )	( )	**1** - Not Present.
( )	( )	( )	**2** - Subthreshold: Occasionally interrupts others.
( )	( )	( )	**3** - Threshold: Often (4-7 days/week) interrupts others.

PAST: ☐ P ☐ C ☐ S

15. Talks Excessively

Do people say you talk too much?
Do you get into trouble at school for talking when you are not supposed to?
Do people in your family complain that you talk too much?
What about humming or always making noises?

Do not rate vocal tics positively.

Rate based on data reported by informant (including parent/teacher) or observational data.

P	C	S	
( )	( )	( )	**0** - No Information.
( )	( )	( )	**1** - Not Present.
( )	( )	( )	**2** - Subthreshold: Occasionally talks excessively.
( )	( )	( )	**3** - Threshold: Often talks excessively.

PAST: ☐ P ☐ C ☐ S

Codes for Remaining Items: **0** = No Information **1** = No **2** = Yes

	Criteria	Parent CE	Parent MSP	Child CE	Child MSP	Summary CE	Summary MSP
16. Duration *For how long have you had trouble (list symptoms that were positively endorsed)?*	6 months or more	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )
17. Age of onset *How old were you when you first started having trouble (list symptoms)?* *Did you have these problems in kindergarten?* *First Grade?* Specify: _____	Onset before age 7	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )
18. Impairment (Must be present in two settings) A. Socially (with peers):		0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )
B. With family:		0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )
C. In school:		0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )	0 1 2 ( ) ( ) ( )

Appendix C. Disruptive Behavior Disorders checklist- Parent and Teacher

Parent / Teacher DBD Rating Scale

Child's Name: _____ Form Completed by: _____

Grade: _____ Date of Birth: _____Sex: _____Date Completed_____

Check the column that best describes your/this child. **Please write DK next to any items for which you don't know the answer.**

	Not at All	Just a Little	Pretty Much	Very Much
1. often interrupts or intrudes on others (e.g., butts into conversations or games)				
2. has run away from home overnight at least twice while living in parental or parental surrogate home (or once without returning for a lengthy period)				
3. often argues with adults				
4. often lies to obtain goods or favors or to avoid obligations (i.e., "cons" others)				
5. often initiates physical fights with other members of his or her household				
6. has been physically cruel to people				
7. often talks excessively				
8. has stolen items of nontrivial value without confronting a victim (e.g., shoplifting, but without breaking and entering; forgery)				
9. is often easily distracted by extraneous stimuli				
10. often engages in physically dangerous activities without considering possible consequences (not for the purpose of thrill-seeking), e.g., runs into street without looking				
11. often truant from school, beginning before age 13 years				
12. often fidgets with hands or feet or squirms in seat				
13. is often spiteful or vindictive				
14. often swears or uses obscene language				
15. often blames others for his or her mistakes or misbehavior				
16. has deliberately destroyed others' property (other than by fire setting)				
17. often actively defies or refuses to comply with adults' requests or rules				
18. often does not seem to listen when spoken to directly				
19. often blurts out answers before questions have been completed				
20. often initiates physical fights with others who do not live in his or her household (e.g., peers at school or in the neighborhood)				
21. often shifts from one uncompleted activity to another				
22. often has difficulty playing or engaging in leisure activities quietly				
23. often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities				
24. is often angry and resentful				
25. often leaves seat in classroom or in other situations in which remaining seated is expected				
26. is often touchy or easily annoyed by others				
27. often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)				
28. often loses temper				
29. often has difficulty sustaining attention in tasks or play activities				
30. often has difficulty awaiting turn				
31. has forced someone into sexual activity				
32. often bullies, threatens, or intimidates others				
33. is often "on the go" or often acts as if "driven by a motor"				
34. often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)				
35. often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)				
36. has been physically cruel to animals				
37. often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)				
38. often stays out at night despite parental prohibitions, beginning before age 13 years				
39. often deliberately annoys people				
40. has stolen while confronting a victim (e.g., mugging, purse snatching, extortion, armed robbery)				
41. has deliberately engaged in fire setting with the intention of causing serious damage				
42. often has difficulty organizing tasks and activities				
43. has broken into someone else's house, building, or car				
44. is often forgetful in daily activities				
45. has used a weapon that can cause serious physical harm to others (e.g., a bat, brick, broken bottle, knife, gun)				

Appendix D. Children's Impairment Rating Scales- Teacher / Parent

Narrative Description of Child -- Teacher

Child's Name: _____ **Teacher's Name:** _____

Date Completed: _____

Instructions: In the space below, please describe what you see as this child's primary problems. Also, please describe how this child's problems have affected the following areas and complete the rating at the end of each: (1) his or her relationship with other children, (2) your relationship with him or her, (3) his or her academic progress, (4) your classroom in general, and (5) his or her self-esteem. Continue on a separate sheet if necessary. **For the ratings, please mark an "X" on the lines at the points that you believe reflect the impact of the child's problems on this area and whether he or she needs treatment or special services for the problems. PLEASE COMPLETE BOTH SIDES OF THIS FORM.**

(1) How this child's problems affect his or her relationship with other children

No Problem |_____| Extreme Problem
Definitely does not need treatment or special services — Definitely needs treatment or special services

Regardless of whether this 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? (Please circle)

YES NO

(2) How this child's problems affect his or her relationship with the teacher

No Problem |_____| Extreme Problem
Definitely does not need treatment or special services — Definitely needs treatment or special services

(Continued)

(3) How this child's problems affect his or her academic progress

No Problem |_____| Extreme Problem
Definitely does not need treatment or special services — Definitely needs treatment or special services

(4) How this child's problems affect your classroom in general

No Problem |_____| Extreme Problem
Definitely does not need treatment or special services — Definitely needs treatment or special services

(5) How this child's problems affect his or her self-esteem

No Problem |_____| Extreme Problem
Definitely does not need treatment or special services — Definitely needs treatment or special services

Please mark an "X" on the following line at the point that you believe reflects the overall severity of this child's problem in functioning and overall need for treatment.

No Problem |_____| Extreme Problem
Definitely does not need treatment or special services — Definitely needs treatment or special services

Narrative Description of Child -- Parent (IRS)

Child's name: _____ **Form completed by:** _____

Date completed: _____

Instructions: In the spaces below, please describe what you see as your child's primary problems in each area, both at home and at school. Also, please describe how your child's problems have affected each area and complete the rating at the end of each by marking an "X" on the lines at the points that describe how much the child's problems affect each area and *whether he or she needs treatment or special services for the problems* (see sample below).

Example:

No Problem Definitely does not need treatment or special services	X	Extreme Problem Definitely needs treatment or special services

1a. How your child's problems affect his or her relationship with playmates

No Problem Definitely does not need treatment or special services		Extreme Problem Definitely needs treatment or special services

1b. Regardless of whether your child is popular of 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?

Yes No

1c. How your child's problems affect his or her relationship with brothers or sisters
(If no siblings, check and skip to #2)

No Problem Definitely does not need treatment or special services		Extreme Problem Definitely needs treatment or special services

2. How your child's problems affect his or her relationship with you (and your spouse if present)

No Problem Definitely does not need treatment or special services		Extreme Problem Definitely needs treatment or special services

4. How your child's problems affect his or her self-esteem

No Problem Definitely does not need treatment or special services		Extreme Problem Definitely needs treatment or special services

5. How your child's problems affect your family in general

No Problem Definitely does not need treatment or special services		Extreme Problem Definitely needs treatment or special services

6. Overall severity of your child's problem in functioning and overall need for treatment

No Problem Definitely does not need treatment or special services		Extreme Problem Definitely needs treatment or special services

Appendix E. Weschler Intelligence Scale for Children, 4th Edition and Wechsler Preschool and Primary Scale of Intelligence, 3rd Edition

WSC-IV

WECHSLER INTELLIGENCE SCALE FOR CHILDREN™ – FOURTH EDITION

Record Form

Child's Name _____

Examiner's Name _____

Calculation of Child's Age

	Year	Month	Day
Date of Testing			
Date of Birth			
Age at Testing			

Total Raw Score to Scaled Score Conversions

Subtest	Raw Score		Scaled Scores				
Block Design							
Similarities							
Digit Span							
Picture Concepts							
Coding							
Vocabulary							
Letter–Number Seq.							
Matrix Reasoning							
Comprehension							
Symbol Search							
(Picture Completion)				( )			( )
(Cancellation)						( )	( )
(Information)			( )				( )
(Arithmetic)					( )		( )
(Word Reasoning)			( )				( )
Sums of Scaled Scores			Verbal Comp.	Perc. Rsng.	Work. Mem.	Proc. Speed	Full Scale

Sum of Scaled Scores to Composite Score Conversions

Scale	Sum of Scaled Scores	Composite Score	Percentile Rank	___% Confidence Interval
Verbal Comprehension		VCI		
Perceptual Reasoning		PRI		
Working Memory		WMI		
Processing Speed		PSI		
Full Scale		FSIQ		

PEARSON

PsychCorp

22 23 24 C D E 277353-5 321

Subtest Scaled Score Profile

	Verbal Comprehension					Perceptual Reasoning				Working Memory			Processing Speed		
	SI	VC	CO	(IN)	(WR)	BD	PCn	MR	(PCm)	DS	LN	(AR)	CD	SS	(CA)
19															
18															
17															
16															
15															
14															
13															
12															
11															
10															
9															
8															
7															
6															
5															
4															
3															
2															
1															

Composite Score Profile

	VCI	PRI	WMI	PSI	FSIQ

160, 150, 140, 130, 120, 110, 100, 90, 80, 70, 60, 50, 40

Product Number 0154979074

1. Block Design (Time Limit: See Item)

Start
Ages 6–7: Item 1
Ages 8–16: Item 3

Reverse
Ages 8–16: Score of 0 or 1 on *either* of the first two items given, administer preceding items in reverse order until two consecutive perfect scores are obtained.

Discontinue
After 3 consecutive scores of 0

Score
Items 1–3: Score 0, 1, or 2 points
Items 4–8: Score 0 or 4 points
Items 9–14: Score 0 or the appropriate time bonus score
BDN
Items 1–3: Score 0, 1, or 2 points
Items 4–14: Score 0 or 4 points

	Design	Presentation Method	Time Limit	Completion Time	Correct Design	Constructed Design	Score
6–7	1. Child / Examiner	Model	30"		Y N	Trial 1 / Trial 2	Trial 2: 0; Trial 1: 1 2
	2.	Model	45"		Y N	Trial 1 / Trial 2	Trial 2: 0; Trial 1: 1 2
8–16	3.	Model and Picture	45"		Y N	Trial 1 / Trial 2	Trial 2: 0; Trial 1: 1 2
	4.	Picture	45"		Y N		0 4
	5.	Picture	45"		Y N		0 4
	6.	Picture	75"		Y N		0 4
	7.	Picture	75"		Y N		0 4
	8.	Picture	75"		Y N		0 4
	9.	Picture	75"		Y N		0 4 5 6 7 (31–75, 21–30, 11–20, 1–10)
	10.	Picture	75"		Y N		0 4 5 6 7 (31–75, 21–30, 11–20, 1–10)
	11.	Picture	120"		Y N		0 4 5 6 7 (71–120, 51–70, 31–50, 1–30)
	12.	Picture	120"		Y N		0 4 5 6 7 (71–120, 51–70, 31–50, 1–30)
	13.	Picture	120"		Y N		0 4 5 6 7 (71–120, 51–70, 31–50, 1–30)
	14.	Picture	120"		Y N		0 4 5 6 7 (71–120, 51–70, 31–50, 1–30)

Total Raw Score (Maximum = 68) ☐

Block Design No Time Bonus (BDN) Total Raw Score (Maximum = 50) ☐

6. Vocabulary

Start
Ages 6–8: Item 5
Ages 9–11: Item 7
Ages 12–16: Item 9

Reverse
Ages 6–16: Score of 0 or 1 on *either* of the first two items given, administer preceding items in reverse order until two consecutive perfect scores are obtained.

Discontinue
After 5 consecutive scores of 0

Score
Items 1–4: Score 0 or 1 point
Items 5–36: Score 0, 1, or 2 points
See *Administration and Scoring Manual* for sample responses.

	Item	Response	Score
	Picture Items		
	1.		0 1
	2.		0 1
	3.		0 1
	4.		0 1
	Verbal Items		
6–8	†5.		0 1 2
	†6.		0 1 2
9–11	7.		0 1 2
	8.		0 1 2
12–16	9.		0 1 2
	10.		0 1 2
	*11.		0 1 2
	12.		0 1 2
	13.		0 1 2
	14.		0 1 2
	15.		0 1 2
	16.		0 1 2
	17.		0 1 2

† If the child does not give a 2-point response, provide the response indicated in the *Administration and Scoring Manual*.
* Responses requiring specific query are identified in the *Administration and Scoring Manual*.

Continue

6. Vocabulary *(Continued)*

Discontinue after **5** consecutive scores of 0

Item	Response	Score
18.		0 1 2
19.		0 1 2
20.		0 1 2
21.		0 1 2
22.		0 1 2
*23.		0 1 2
24.		0 1 2
25.		0 1 2
26.		0 1 2
27.		0 1 2
28.		0 1 2
29.		0 1 2
30.		0 1 2
31.		0 1 2
*32.		0 1 2
*33.		0 1 2
34.		0 1 2
35.		0 1 2
36.		0 1 2

* Responses requiring specific query are identified in the *Administration and Scoring Manual.*

Total Raw Score (Maximum = 68) ☐

wppsi-III

WECHSLER PRESCHOOL AND PRIMARY SCALE OF INTELLIGENCE — THIRD EDITION

Record Form

Ages 4:0–7:3

Child _____

Sex_____ Grade_____ Handedness_____

School_____

Parent/Guardian_____

Place of Testing_____

Examiner_____

Calculation of Child's Age

	Year	Month	Day
Date of Testing			
Date of Birth			
Age at Testing			

Total Raw Score to Scaled Score Conversions

Subtest	Raw Score	Scaled Scores					
Block Design							
Information							
Matrix Reasoning							
Vocabulary							
Picture Concepts							
(Symbol Search)						( )	
Word Reasoning							
Coding							
(Comprehension)			( )			( )	
(Picture Comp.)				( )		( )	
(Similarities)			( )			( )	
(Receptive Voc.)							
(Object Assembly)				( )		( )	
(Picture Naming)							
Sums of Scaled Scores			Verbal	Perf.	Pr. Spd.	Full Scale	GL optional

Sum of Scaled Scores to Composite Score Conversions

Scale	Sum of Scaled Scores	Composite Score	Percentile Rank	___% Confidence Interval
Verbal		VIQ		
Performance		PIQ		
Pr. Spd.		PSQ		
Full		FSIQ		
GL		GLC		

PEARSON

To reorder WPPSI–III Record Forms, call 1-800-211-8378

Subtest Scaled Score Profile

	Verbal					Performance					Pr. Spd.		GL	
	IN	VC	WR	CO	SI	BD	MR	PCn	PCm	OA	SS	CD	RV	PN
19	•	•	•	•	•	•	•	•	•	•	•	•	•	•
18	•	•	•	•	•	•	•	•	•	•	•	•	•	•
17	•	•	•	•	•	•	•	•	•	•	•	•	•	•
16	•	•	•	•	•	•	•	•	•	•	•	•	•	•
15	•	•	•	•	•	•	•	•	•	•	•	•	•	•
14	•	•	•	•	•	•	•	•	•	•	•	•	•	•
13	•	•	•	•	•	•	•	•	•	•	•	•	•	•
12	•	•	•	•	•	•	•	•	•	•	•	•	•	•
11	•	•	•	•	•	•	•	•	•	•	•	•	•	•
10	•	•	•	•	•	•	•	•	•	•	•	•	•	•
9	•	•	•	•	•	•	•	•	•	•	•	•	•	•
8	•	•	•	•	•	•	•	•	•	•	•	•	•	•
7	•	•	•	•	•	•	•	•	•	•	•	•	•	•
6	•	•	•	•	•	•	•	•	•	•	•	•	•	•
5	•	•	•	•	•	•	•	•	•	•	•	•	•	•
4	•	•	•	•	•	•	•	•	•	•	•	•	•	•
3	•	•	•	•	•	•	•	•	•	•	•	•	•	•
2	•	•	•	•	•	•	•	•	•	•	•	•	•	•
1	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Composite Score Profile

	VIQ	PIQ	PSQ	FSIQ	GLC
160					
150					
140					
130					
120					
110					
100					
90					
80					
70					
60					
50					
40					

19 20 21 22 23 24 B C D E 276155-2 11109876

1. Block Design

Time Limit: See Item

Start
Ages 4–7: Item 6

Reverse
Score of **0** or **1** on *either* of the first two items given, administer preceding items in reverse order until two consecutive perfect scores are obtained.

Discontinue
After **3** consecutive scores of 0

Score
Items 1–6: Score **0**, **1**, or **2** points
Items 7–20: Score **0** or **2** points

	Design	Blocks Needed	Presentation Method	Time Limit	Completion Time	Correct Design	Incorrect Design	Score
Part A	1. Child  Examiner	4 Red	Model	30"		Y N	Trial 1  Trial 2 	0 Trial 2 1 Trial 1 2
	2. 	6 Red	Model	30"		Y N	Trial 1  Trial 2 	0 Trial 2 1 Trial 1 2
	3. 	6 Red	Model	30"		Y N	Trial 1  Trial 2 	0 Trial 2 1 Trial 1 2
	4. 	4 Red	Model	30"		Y N	Trial 1  Trial 2 	0 Trial 2 1 Trial 1 2
	5. 	2 Red, 2 White	Model	30"		Y N	Trial 1  Trial 2 	0 Trial 2 1 Trial 1 2
4–7	6. 	4 Red, 2 White	Model	30"		Y N	Trial 1  Trial 2 	0 Trial 2 1 Trial 1 2
	7. 	2 Red, 2 White	Model	30"		Y N		0 2
	8. 	6 Red	Model	60"		Y N		0 2
	9. 	4 Red, 4 White	Model	60"		Y N		0 2
	10. 	4 Red, 4 White	Model	60"		Y N		0 2
Part B	Sample A  If the child does not pass Sample A, administer Sample B.					Sample B 		
	11. 	4 two-color	Model	60"		Y N		0 2
	12. 	4 two-color	Model	60"		Y N		0 2
	13. 	4 two-color	Model and Picture	60"		Y N		0 2
	14. 	4 two-color	Picture	90"		Y N		0 2
	15. 	4 two-color	Picture	90"		Y N		0 2
	16. 	4 two-color	Picture	90"		Y N		0 2
	17. 	4 two-color	Picture	90"		Y N		0 2
	18. 	4 two-color	Picture	90"		Y N		0 2
	19. 	4 two-color	Picture	90"		Y N		0 2
	20. 	4 two-color	Picture	90"		Y N		0 2

Total Raw Score
(Maximum = 40)

4. Vocabulary

Start Ages 4–7: Item 6

Reverse Score of **0** on *either* of the first two items given, administer preceding items in reverse order until two consecutive perfect scores are obtained.

Discontinue After **5** consecutive scores of 0

Score **Items 1–7:** Score **0** or **1** point **Items 8–25:** Score **0, 1,** or **2** points See Administration and Scoring Manual for sample responses.

Item	Response	Score
Picture Items		
1. Car		0 1
2. Clock		0 1
3. Fork		0 1
4. Turtle		0 1
5. Pumpkin		0 1
Verbal Items		
4–7 † 6. Shoe		0 1
† 7. Telephone		0 1
8. Umbrella		0 1 2
9. Bicycle		0 1 2
10. Candy		0 1 2
11. Dog		0 1 2
* 12. Letter		0 1 2
13. Train		0 1 2
* 14. Leaf		0 1 2
15. Hero		0 1 2
16. Castle		0 1 2
17. Glow		0 1 2
18. Polite		0 1 2
19. Holiday		0 1 2
20. Swing		0 1 2
21. Double		0 1 2
22. Courage		0 1 2
23. Ancient		0 1 2
24. Microscope		0 1 2
25. Nuisance		0 1 2

† If the child does not give a 1-point response, provide the response indicated in the Administration and Scoring Manual.

* Responses requiring specific query are identified in the Administration and Scoring Manual.

Total Raw Score (Maximum = 43)

Appendix F. Parent-Child Interaction Protocol

Introduction

1. Greeting the mom and bring her and child into observation room
2. Introduce PCI to mom and Child outside of the observation room
    a. "*During the next few minutes I will be asking you to participate in some activities with your child. During this time please do not leave the room. Also, please speak-up when you are talking to your child. We also ask that you only speak English for the duration of the task. This is so we will understand you. I will need to take any bags or coats you may have now. I will keep these items for you in my office. Please do not eat or chew gum for the duration of this task."*

CLEAN UP

1. Hand the "Where Things Go" Handout to the mother.
2. Give "Clean up: instructions
    a. "*Please have your child place everything where it goes according to this list. You may not help your child physical. You may only instruct your child where things go. Please stay in this room until I come to get you*."
3. Begin timing 5 minutes

FREE PLAY

1. At the end of 5 minutes, enter the room and praise child and mother for doing a good job.
2. Place all items on shelving unit.
    a. Items to be used: Conmect-4; Jenga; Trouble; Cars; School bus & school house
3. Give Instructions to mother
    a. *"In this situation, tell (child's name) that s/he may play whatever s/he chooses. Let her/him choose any activity s/he wishes. You just follow her/his lead and play along with her/him. Please stay in this room until I come to get you*."
4. Begin timing 5 minutes

HOMEWORK TASK

1. At the end of 5 minutes, enter the room. Praise the mother and child for doing well.
2. Hand math worksheet and pencil to the mother.
3. Give mother instructions
    a. *"(Child's name) should complete this worksheet. Please provide as little or as much help as you think is needed. Your child should not skip any problems and do them in order. Please stay in this room until I come to get you."*
4. After 10 minutes have passed (or if the child finishes early), enter the room and thank the mother and their child for their hard work.

Appendix G. Conner's Adult ADHD Rating Scale

CAARS Self-Report: Long Version (CAARS-S:L)

Study ID:_____ Gender: M F Age:_____ Today's Date:____/____/_____

(circle one) (month/ day/ year)

Instructions: Listed below are items concerning behaviors or problems sometimes experienced by adults. Read each item carefully and decide how much or how frequently each item describes you recently. Indicate your response for each item by checking the box that corresponds to your choice.

	Not at All, Never	**Just a Little, Once in a while**	**Pretty Much, Often**	**Very Much, Very Frequently**
1. I like to be doing active things.				
2. I lose things necessary for tasks or activities. (e.g. to-do lists, pencils, book, or tools)				
3. I don't plan ahead.				
4. I blurt out things.				
5. I am a risk taker or a daredevil.				
6. I get down on myself.				
7. I don't finish things I start.				
8. I am easily frustrated.				
9. I talk too much.				
10. I am always on the go, as if driven by a motor.				
11. I'm disorganized.				
12. I say things without thinking.				
13. It's hard for me to stay in one place very long.				
14. I have trouble doing leisure activities quietly.				

15. I'm not sure of myself.				
16. It's hard for me to keep track of several things at once.				
17. I'm always moving even when I should be still.				
18. I forget to remember things.				
19. I have a short fuse/hot temper.				
20. I'm bored easily.				
21. I leave my seat when I am not supposed to.				
22. I have trouble waiting in line or taking turns with others.				
	Not at All, Never	**Just a Little, Once in a while**	**Pretty Much, Often**	**Very Much, Very Frequently**
23. I still throw tantrums.				
24. I have trouble keeping my attention focused when working.				
25. I seek out fast paced, exciting activities.				
26. I avoid new challenges because I lack faith in my abilities.				
27. I feel restless inside even if I am sitting still.				
28. Things I hear or see distract me from what I'm doing.				
29. I am forgetful in my daily activities.				
30. Many things set me off easily.				
31. I dislike quiet, introspective activities.				
32. I lose things that I need.				
33. I have trouble listening to what other people are saying.				
34. I am an underachiever.				

35. I interrupt others when talking.				
36. I change plans/jobs in midstream.				
37. I act okay on the outside, but inside I'm unsure of myself.				
38. I am always on the go.				
39. I make comments/remarks that I wish I could take back.				
40. I can't get things done unless there's an absolute deadline.				
41. I fidget (with my hands or feet) or squirm in my seat.				
42. I make careless mistakes or have trouble paying close attention to detail.				
43. I step on people's toes without meaning to.				
44. I have trouble getting started on a task.				
45. I intrude on others' activities.				
46. It takes a great deal of effort for me to sit still.				
47. My moods are unpredictable.				
48. I don't like homework or job activities where I have to think a lot.				
	Not at All, Never	**Just a Little, Once in a while**	**Pretty Much, Often**	**Very Much, Very Frequently**
49. I'm absent-minded in daily activities.				
50. I am restless or overactive.				
51. I depend on others to keep my life in order and attend to the details.				
52. I annoy other people without meaning to.				

53. Sometimes my attention narrows so much that I'm oblivious to everything else; other times it's so broad that everything distracts me.				
54. I tend to squirm or fidget.				
55. I can't keep my mind on something unless it's really interesting.				
56. I wish I had greater confidence in my abilities.				
57. I can't sit still for very long.				
58. I give answers to questions before the questions have been completed.				
59. I like to be up and on the go rather than being in one place.				
60. I have trouble finishing job tasks or schoolwork.				
61. I am irritable.				
62. I interrupt others when they are working or playing.				
63. My past failures make it hard for me to believe in myself.				
64. I am distracted when things are going on around me.				
65. I have problems organizing my tasks and activities.				
66. I misjudge how long it takes to do something or go somewhere.				

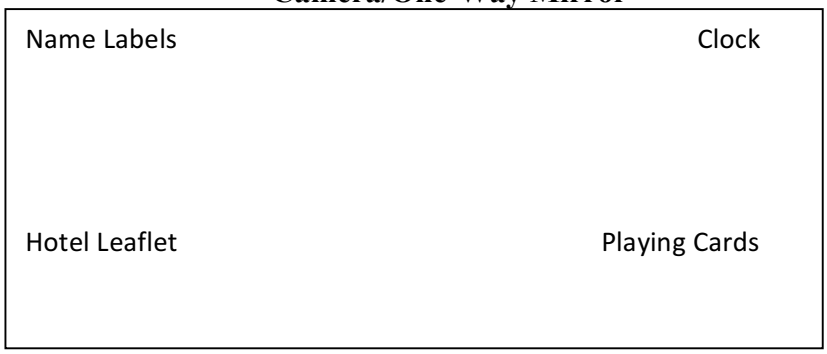
Appendix H. Hotel Test instructions

Hotel Test Administration Instructions

While the mother is out of the room, please set up the table in accordance with this picture (5 tasks should be switched around table each time**):**

*Make sure the clock is not blocking the camera's and researcher's line of vision (we put the clock on a separate table).

Camera/One-Way Mirror



Mother

Walk mother into the room and have her sit in the chair in front of the desk. Read to mother the following instructions:

Say to participant:
"In this task you have to imagine that you are working in a hotel. Your manager is keen for you to try each of these five everyday activities during the next 10 min so that you can get a 'feel' for the work—and make an informed estimate of how long each would take to complete. Your main job is therefore to **try to do at least some of all these five tasks over the next 10 min**. There are five main tasks to do. Each of the tasks may well take longer than 10 min to complete on its own so **there is no way that you will be able to complete them all**. The most important thing is to try and do something from each task—spending as much time on each as possible within the total time available."

"The different tasks include:

Writing out customer bills.
This list has all the charges which need to be billed to each customer. You need to search through the list to find all the charges for each customer, and write them on the bills.
(demonstrate a little of the task)

Also, I would like you to sort the money from the charity collection.
Some of the coins are foreign, so they need to be separated out. Then the United States coins need to be sorted into the bank bags, with $1 in each bag.

(demonstrate a little of the task eg. separate a few of the foreign coins)

I would like you to you proof-read this new leaflet for the hotel.
The typist keeps typing letters twice, by accident, like this -
neww menu
You need to read through the text and circle any mistakes you find using this pen.
(demonstrate a little of the task and read through the first few lines until you get to the first few mistakes ie. arrea and thirrty)

I would like you to sort out this pile of cards into 3 separate packs please.
The cards get mixed up in the Casino and we need to make sure that we have whole packs.
Please make sure the cards are in order (2, 3, 4, and so on up to Jack, Queen, King, Ace) and in the correct suits (Hearts, Clubs, Diamonds and Spades).
(demonstrate a little of the task)

And also, please sort these conference name labels into alphabetical order, according to their last names?"
(demonstrate a little of the task)

Then
"Please explain to me what you are supposed to do for each task and what your goal for the overall test is."

- Only continue if s/he understands the main goal - to try and do as much as possible from each of the tasks within the 10 min available.

"The test will start at 11 o'clock and run until 10 past. **The clock will be covered, but you can check the clock whenever you want."**

- Show participant the clock. The cover is just so that the tester can see when the participant does this. Set the time to 11 o'clock (in practice it's easier to set the time beforehand and only put the battery in when ready to begin the test.) Start your stopwatch at the same time.
- Sit out of view of the participant and note down the time at which activity started and stopped, and the number of times that the clock was consulted.
- *If after 5 min of the test, a participant is still engaged in the first task attempted, s/he is to be given a* ***reminder of the primary aim of completing something from each task.*** *No further prompts should be given.*

"Keep working until I come get you."

After 10 minutes:
"You can stop now. Please tell me again what you were supposed to do for each task and what your goal for the overall test was."
"Now please tell me what your strategy was to get through each task as well as what your strategy was to get through the overall test."

- Record their responses.
- Scores are the number of tasks attempted, and the time deviation.
- Score whether or not the task was accurately attempted (correct charges written on bills, name tags alphabetized correctly, $1 in each money bag, errors in leaflet correctly IDed).
- Score # of items completed within each task (ex. # of charges correctly written on the bills, # of name cards correctly alphabetized, # of money bags correctly sorted, # of correctly identified errors in the leaflet (omissions and commissions), # of cards correctly sorted).
- Placing of test items is randomised across Subjects (ie. so that not all subjects start with the same test eg. the one that is always on their right)
- Save the materials that were written on (you can reuse the pieces that were not written on and just replace the ones that have been)

Appendix I. Barkley Deficits in Executive Functioning Scale

BDEFS-LF: Self-Report

Name: _____ Date: _____

Sex: (Circle one) Male Female Age: _____

Instructions

How often do you experience each of these problems? Please circle the number next to each item that best describes your behavior **DURING THE PAST 6 MONTHS**. Please ignore the sections marked "Office Use Only."

Section 1 Items	Never or rarely	Some-times	Often	Very often
1. Procrastinate or put off doing things until the last minute	1	2	3	4
2. Poor sense of time	1	2	3	4
3. Waste or mismanage my time	1	2	3	4
4. Not prepared on time for work or assigned tasks	1	2	3	4
5. Fail to meet deadlines for assignments	1	2	3	4
6. Have trouble planning ahead or preparing for upcoming events	1	2	3	4
7. Forget to do things I am supposed to do	1	2	3	4
8. Can't seem to accomplish the goals I set for myself	1	2	3	4
9. Late for work or scheduled appointments	1	2	3	4
10. Can't seem to hold in mind things I need to remember to do	1	2	3	4
11. Can't seem to get things done unless there is an immediate deadline	1	2	3	4
12. Have difficulty judging how much time it will take to do something or get somewhere	1	2	3	4
13. Have trouble motivating myself to start work	1	2	3	4
14. Have difficulty motivating myself to stick with my work and get it done	1	2	3	4
15. Not motivated to prepare in advance for things I know I am supposed to do	1	2	3	4
16. Have trouble completing one activity before starting into a new one	1	2	3	4
17. Have trouble doing what I tell myself to do	1	2	3	4
18. Difficulties following through on promises or commitments I may make to others	1	2	3	4
19. Lack self-discipline	1	2	3	4
20. Have difficulty arranging or doing my work by its priority or importance; can't "prioritize" well	1	2	3	4
21. Find it hard to get started or get going on things I need to get done	1	2	3	4
Office Use Only—**Section 1 Total Score** _____				

(cont.)

Section 2 Items	Never or rarely	Some-times	Often	Very often
22. I do not seem to anticipate the future as much or as well as others	1	2	3	4
23. Can't seem to remember what I previously heard or read about	1	2	3	4
24. I have trouble organizing my thoughts	1	2	3	4
25. When I am shown something complicated to do, I cannot keep the information in mind so as to imitate or do it correctly	1	2	3	4
26. I have trouble considering various options for doing things and weighing their consequences	1	2	3	4
27. Have difficulties saying what I want to say	1	2	3	4
28. Unable to come up with or invent as many solutions to problems as others seem to do	1	2	3	4
29. Find myself at a loss for words when I want to explain something to others	1	2	3	4
30. Have trouble putting my thoughts down in writing as well or as quickly as others	1	2	3	4
31. Feel I am not as creative or inventive as others of my level of intelligence	1	2	3	4
32. In trying to accomplish goals or assignments, I find I am not able to think of as many ways of doing things as others	1	2	3	4
33. Have trouble learning new or complex activities as well as others	1	2	3	4
34. Have difficulty explaining things in their proper order or sequence	1	2	3	4
35. Can't seem to get to the point of my explanations as quickly as others	1	2	3	4
36. Have trouble doing things in their proper order or sequence	1	2	3	4
37. Unable to "think on my feet" or respond as effectively as others to unexpected events	1	2	3	4
38. I am slower than others at solving problems I encounter in my daily life	1	2	3	4
39. Easily distracted by irrelevant events or thoughts when I must concentrate on something	1	2	3	4
40. Not able to comprehend what I read as well as I should be able to do; have to reread material to get its meaning	1	2	3	4
41. Cannot focus my attention on tasks or work as well as others	1	2	3	4
42. Easily confused	1	2	3	4
43. Can't seem to sustain my concentration on reading, paperwork, lectures, or work	1	2	3	4
44. Find it hard to focus on what is important from what is not important when I do things	1	2	3	4
45. I don't seem to process information as quickly or as accurately as others	1	2	3	4
Office Use Only—**Section 2 Total Score** _____				

(cont.)

Section 3 Items	Never or rarely	Some-times	Often	Very often
46. Find it difficult to tolerate waiting; impatient	1	2	3	4
47. Make decisions impulsively	1	2	3	4
48. Unable to inhibit my reactions or responses to events or others	1	2	3	4
49. Have difficulty stopping my activities or behavior when I should do so	1	2	3	4
50. Have difficulty changing my behavior when I am given feedback about my mistakes	1	2	3	4
51. Make impulsive comments to others	1	2	3	4
52. Likely to do things without considering the consequences for doing them	1	2	3	4
53. Change my plans at the last minute on a whim or last minute impulse	1	2	3	4
54. Fail to consider past relevant events or past personal experiences before responding to situations (I act without thinking)	1	2	3	4
55. Not aware of things I say or do	1	2	3	4
56. Have difficulty being objective about things that affect me	1	2	3	4
57. Find it hard to take other people's perspectives about a problem or situation	1	2	3	4
58. Don't think about or talk things over with myself before doing something	1	2	3	4
59. Trouble following the rules in a situation	1	2	3	4
60. More likely to drive a motor vehicle much faster than others (Excessive speeding)	1	2	3	4
61. Have a low tolerance for frustrating situations	1	2	3	4
62. Cannot inhibit my emotions as well as others	1	2	3	4
63. I don't look ahead and think about what the future outcomes will be before I do something (I don't use my foresight)	1	2	3	4
64. I engage in risk taking activities more than others are likely to do	1	2	3	4
Office Use Only—**Section 3 Total Score** _____				

Section 4 Items	Never or rarely	Some-times	Often	Very often
65. Likely to take short cuts in my work and not do all that I am supposed to do	1	2	3	4
66. Likely to skip out on work early if my work is boring to do	1	2	3	4
67. Do not put as much effort into my work as I should or than others are able to do	1	2	3	4
68. Others tell me I am lazy or unmotivated	1	2	3	4
69. Have to depend on others to help me get my work done	1	2	3	4

(cont.)

70. Things must have an immediate payoff for me or I do not seem to get them done	1	2	3	4
71. Have difficulty resisting the urge to do something fun or more interesting when I am supposed to be working	1	2	3	4
72. Inconsistent in the quality or quantity of my work performance	1	2	3	4
73. Unable to work as well as others without supervision or frequent instruction	1	2	3	4
74. I do not have the willpower or determination that others seem to have	1	2	3	4
75. I am not able to work toward longer term or delayed rewards as well as others	1	2	3	4
76. I cannot resist doing things that produce immediate rewards even if they are not good for me in the long run	1	2	3	4
Office Use Only—**Section 4 Total Score** _____				
Section 5 Items	Never or rarely	Some-times	Often	Very often
77. Quick to get angry or become upset	1	2	3	4
78. Overreact emotionally	1	2	3	4
79. Easily excitable	1	2	3	4
80. Unable to inhibit showing strong negative or positive emotions	1	2	3	4
81. Have trouble calming myself down once I am emotionally upset	1	2	3	4
82. Cannot seem to regain emotional control and become more reasonable once I am emotional	1	2	3	4
83. Cannot seem to distract myself away from whatever is upsetting me emotionally to help calm me down. I can't refocus my mind to a more positive framework.	1	2	3	4
84. Unable to manage my emotions in order to accomplish my goals successfully or get along well with others	1	2	3	4
85. I remain emotional or upset longer than others	1	2	3	4
86. I find it difficult to walk away from emotionally upsetting encounters with others or leave situations in which I have become very emotional	1	2	3	4
87. I cannot rechannel or redirect my emotions into more positive ways or outlets when I get upset	1	2	3	4
88. I am not able to evaluate an emotionally upsetting event more objectively	1	2	3	4
89. I cannot redefine negative events into more positive viewpoints when I feel strong emotions	1	2	3	4
Office Use Only—**Section 5 Total Score** _____				

(cont.)

Office Use Only **Total of Sections 1–5: Total EF Summary Score** _____				
Office Use Only **Count number of items answered 3 or 4** **EF Symptom Count** _____				
Office Use Only **Add Items 1, 6, 14, 16, 24, 49, 50, 55, 60, 65, and 69** **ADHD-EF Index Score**				

Appendix J. Digit Span

3. Digit Span

Start
Ages 16–90:
Forward: Item 1
Backward: Sample Item, then Item 1
Sequencing: Sample Item, then Item 1

Discontinue
Forward: After scores of **0** on *both trials* of an item
Backward: After scores of **0** on *both trials* of an item
Sequencing: After scores of **0** on *both trials* of an item

Score
Score **0** or **1** point for each trial.
DSF, DSB, and DSS
Total raw score for Forward, Backward, and Sequencing, respectively
LDSF, LDSB, and LDSS
Number of digits recalled on last trial scored 1 point on Forward, Backward, and Sequencing, respectively

Forward

	Item	Trial	Response	Trial Score	Item Score
16–90	1.	9 – 7		0 1	0 1 2
		6 – 3		0 1	
	2.	5 – 8 – 2		0 1	0 1 2
		6 – 9 – 4		0 1	
	3.	7 – 2 – 8 – 6		0 1	0 1 2
		6 – 4 – 3 – 9		0 1	
	4.	4 – 2 – 7 – 3 – 1		0 1	0 1 2
		7 – 5 – 8 – 3 – 6		0 1	
	5.	3 – 9 – 2 – 4 – 8 – 7		0 1	0 1 2
		6 – 1 – 9 – 4 – 7 – 3		0 1	
	6.	4 – 1 – 7 – 9 – 3 – 8 – 6		0 1	0 1 2
		6 – 9 – 1 – 7 – 4 – 2 – 8		0 1	
	7.	3 – 8 – 2 – 9 – 6 – 1 – 7 – 4		0 1	0 1 2
		5 – 8 – 1 – 3 – 2 – 6 – 4 – 7		0 1	
	8.	2 – 7 – 5 – 8 – 6 – 3 – 1 – 9 – 4		0 1	0 1 2
		7 – 1 – 3 – 9 – 4 – 2 – 5 – 6 – 8		0 1	

LDSF (Max = 9)

Digit Span Forward (DSF) Total Raw Score (Maximum = 16)

Backward

	Item	Trial	Correct Response	Response	Trial Score	Item Score
16–90	S.	7 – 1	1 – 7			
		3 – 4	4 – 3			
16–90	1.	3 – 1	1 – 3		0 1	0 1 2
		2 – 4	4 – 2		0 1	
	2.	4 – 6	6 – 4		0 1	0 1 2
		5 – 7	7 – 5		0 1	
	3.	6 – 2 – 9	9 – 2 – 6		0 1	0 1 2
		4 – 7 – 5	5 – 7 – 4		0 1	
	4.	8 – 2 – 7 – 9	9 – 7 – 2 – 8		0 1	0 1 2
		4 – 9 – 6 – 8	8 – 6 – 9 – 4		0 1	
	5.	6 – 5 – 8 – 4 – 3	3 – 4 – 8 – 5 – 6		0 1	0 1 2
		1 – 5 – 4 – 8 – 6	6 – 8 – 4 – 5 – 1		0 1	
	6.	5 – 3 – 7 – 4 – 1 – 8	8 – 1 – 4 – 7 – 3 – 5		0 1	0 1 2
		7 – 2 – 4 – 8 – 5 – 6	6 – 5 – 8 – 4 – 2 – 7		0 1	
	7.	8 – 1 – 4 – 9 – 3 – 6 – 2	2 – 6 – 3 – 9 – 4 – 1 – 8		0 1	0 1 2
		4 – 7 – 3 – 9 – 6 – 2 – 8	8 – 2 – 6 – 9 – 3 – 7 – 4		0 1	
	8.	9 – 4 – 3 – 7 – 6 – 2 – 1 – 8	8 – 1 – 2 – 6 – 7 – 3 – 4 – 9		0 1	0 1 2
		7 – 2 – 8 – 1 – 5 – 6 – 4 – 3	3 – 4 – 6 – 5 – 1 – 8 – 2 – 7		0 1	

LDSB (Max = 8)

Digit Span Backward (DSB) Total Raw Score (Maximum = 16)

continue

3. Digit Span *(continued)*

Sequencing

Discontinue after scores of **0** on *both trials* of an item.

	Item	Trial	Correct Response	Response	Trial Score	Item Score
16–90	S.	2 – 3 – 1	1 – 2 – 3			
		5 – 2 – 2	2 – 2 – 5			
16–90	1.	1 – 2	1 – 2		0 1	0 1 2
		4 – 2	2 – 4		0 1	
	2.	3 – 1 – 6	1 – 3 – 6		0 1	0 1 2
		0 – 9 – 4	0 – 4 – 9		0 1	
	3.	8 – 7 – 9 – 2	2 – 7 – 8 – 9		0 1	0 1 2
		4 – 8 – 7 – 1	1 – 4 – 7 – 8		0 1	
	4.	2 – 6 – 9 – 1 – 7	1 – 2 – 6 – 7 – 9		0 1	0 1 2
		3 – 8 – 3 – 5 – 8	3 – 3 – 5 – 8 – 8		0 1	
	5.	2 – 1 – 7 – 4 – 3 – 6	1 – 2 – 3 – 4 – 6 – 7		0 1	0 1 2
		6 – 2 – 5 – 2 – 3 – 4	2 – 2 – 3 – 4 – 5 – 6		0 1	
	6.	7 – 5 – 7 – 6 – 8 – 6 – 2	2 – 5 – 6 – 6 – 7 – 7 – 8		0 1	0 1 2
		4 – 8 – 2 – 5 – 4 – 3 – 5	2 – 3 – 4 – 4 – 5 – 5 – 8		0 1	
	7.	5 – 8 – 7 – 2 – 7 – 5 – 4 – 5	2 – 4 – 5 – 5 – 5 – 7 – 7 – 8		0 1	0 1 2
		9 – 4 – 9 – 7 – 3 – 0 – 8 – 4	0 – 3 – 4 – 4 – 7 – 8 – 9 – 9		0 1	
	8.	5 – 0 – 1 – 1 – 3 – 2 – 1 – 0 – 5	0 – 0 – 1 – 1 – 1 – 2 – 3 – 5 – 5		0 1	0 1 2
		2 – 7 – 1 – 4 – 8 – 4 – 2 – 9 – 6	1 – 2 – 2 – 4 – 4 – 6 – 7 – 8 – 9		0 1	

LDSS (Max = 9)

Digit Span Sequencing (DSS) Total Raw Score (Maximum = 16)

Digit Span Total Raw Score (Maximum = 48)

Appendix K. Wechsler Test of Adult Reading

WTAR Word List

Say, **I will show you some words that I will ask you to pronounce.** Place the WTAR Word Card in front of the examinee. As you point to the card, say, **Beginning with the first word on the list, pronounce each word aloud. Start with this word** (point to Item 1), **and go down this column, one right after the other, without skipping any. When you finish this column, go to the next column** (point to the second column). **Pronounce each word even if you are unsure. Do you understand?** When you are sure that the examinee understands the task, say, **Ready? Begin.**

	Item	Pronunciation	Score (0, 1)		Item	Pronunciation	Score (0, 1)
1.	again	uh-GEHN *or* uh-GAIN		26.	conscientious	kon-chee-EN-shus *or* kon-chee-INCH-us	
2.	address	uh-DRESS *or* AD-dress		27.	homily	HAHM-uh-lee	
3.	cough	kawf *or* kof		28.	malady	MAL-uh-dee	
4.	preview	PREE-vyue		29.	subtle	SUH-tl	
5.	although	awl-THO		30.	fecund	FE-cund *or* FEE-cund	
6.	most	mohst		31.	palatable	PAL-uh-tuh-bul	
7.	excitement	eck-SITE-munt *or* ik-SITE-munt		32.	menagerie	muh-NAJ-uh-ree	
8.	know	noh *or* no		33.	obfuscate	OB-fuh-skate *or* ob-FUH-skate	
9.	plumb	plum		34.	liaison	lee-A-zahn *or* LAY-a-zahn *or* LEE-ah-zahn	
10.	decorate	DEK-uh-rate		35.	exigency	EKS-eh-jen-see *or* ek-ZEE-jen-see	
11.	fierce	firhrss		36.	xenophobia	zen-uh-FO-bee-uh *or* zeen-uh-FO-bee-uh	
12.	knead	need		37.	ogre	OH-gur	
13.	aisle	EYE-l		38.	scurrilous	SKUR-uh-lus *or* SKUH-ruh-lus	
14.	vengeance	VEN-junts *or* VIN-junts		39.	ethereal	ih-THEER-ee-uhl *or* ih-THIR-ee-uhl	
15.	prestigious	pre-STIJ-us *or* pre-STEEJ-us		40.	paradigm	PAIR-uh-dime *or* PAIR-uh-dim	
16.	wreathe	reeTH		41.	perspicuity	pur-spuh-KYEW-uh-tee	
17.	gnat	nat		42.	plethora	PLETH-er-aah	
18.	amphitheater	AM(p)-fuh-the-uh-ter		43.	lugubrious	loo-GOO-bree-us *or* luh-GOO-bree-us *or* loo-GYEW-bree-us	
19.	lieu	loo		44.	treatise	TREET-us	
20.	grotesque	gro-TESK		45.	dilettante	DILL-uh-tahnt	
21.	iridescent	ihr-uh-DESS-unt		46.	vertiginous	vur-TI-jin-us *or* vur-TIJ-uh-nus	
22.	ballet	BA-lay *or* ba-LAY		47.	ubiquitous	you-BIC-wuh-tus *or* you-BIH-kwah-tus	
23.	equestrian	ih-KWESS-tree-un		48.	hyperbole	hi-PUR-buh-lee	
24.	porpoise	POR-pus		49.	insouciant	in-SOO-see-yunt	
25.	aesthetic	ess-THET-ik *or* ees-THET-ik		50.	hegemony	heh-JEM-o-nee *or* he-je-MO-nee	
						WTAR Raw Score	
						WTAR Standard Score	

4

wtar™

WECHSLER® TEST OF ADULT READING™

WORD CARD

1. again
2. address
3. cough
4. preview
5. although
6. most
7. excitement
8. know
9. plumb
10. decorate
11. fierce
12. knead
13. aisle
14. vengeance
15. prestigious
16. wreathe
17. gnat
18. amphitheater
19. lieu
20. grotesque
21. iridescent
22. ballet
23. equestrian
24. porpoise
25. aesthetic
26. conscientious
27. homily
28. malady
29. subtle
30. fecund
31. palatable
32. menagerie
33. obfuscate
34. liaison
35. exigency
36. xenophobia
37. ogre
38. scurrilous
39. ethereal
40. paradigm
41. perspicuity
42. plethora
43. lugubrious
44. treatise
45. dilettante
46. vertiginous
47. ubiquitous
48. hyperbole
49. insouciant
50. hegemony

References

Aiken, L. S., & West, G. M. (1991). Multiple regression: Testing and interpreting interactions. Newbury Park: Sage Publishing.

Ambrosini, P. J. (2000). Historical development and present status of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS). *Journal of the American Academy of Child & Adolescent Psychiatry*, 39, 49-58. doi:10.1097/00004583-200001000-00016

Barkley, R. A. (1988). The effects of methylphenidate on the interactions of preschool ADHD children with their mothers. *Journal of the American Academy of Child & Adolescent Psychiatry*, *27*, 336-341. doi:10.1097/00004583-198805000-00012

Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: constructing a unifying theory of ADHD. *Psychological bulletin*, *121*, 65-94.

Barkley, R. A. (2011). Barkley Deficits in Executive Functioning Scale (BDEFS). New York, NY US: Guilford Press.

Barkley, R. A. (2013). Defiant children: A clinician's manual for assessment and parent training (3rd ed.). New York, NY US: Guilford Press.

Barkley, R. A., & Murphy, K. R. (2010). Impairment in occupational functioning and adult ADHD: The predictive utility of executive function (EF) ratings versus EF tests. *Archives of Clinical Neuropsychology*, *25*, 157-173. doi:10.1093/arclin/acq014

Barkley, R. A., & Murphy, K. R. (2011). The nature of executive function (EF) deficits in daily life activities in adults with ADHD and their relationship to performance on EF tests. *Journal of Psychopathology and Behavioral Assessment*, 33, 137-158. doi:10.1007/s10862-011-9217-x

Barrett, J., & Fleming, A. S. (2011). Annual research review: All mothers are not created equal: Neural and psychobiological perspectives on mothering and the importance of individual differences. *Journal of Child Psychology and Psychiatry*, 52, 368-397. doi:10.1111/j.1469-7610.2010.02306.x

Bauermeister, J. J., Shrout, P. E., Chávez, L., Rubio‐Stipec, M., Ramírez, R., Padilla, L., ... & Canino, G. (2007). ADHD and gender: are risks and sequela of ADHD the same for boys and girls?. *Journal of Child Psychology and Psychiatry*, *48*, 831-839.

Bell, M.A., & Deater-Deckard, K. (2007). Biological systems and the development of self-regulation: Integrating behavior, genetics, and psychophysiology. *Journal of Developmental & Behavioral Pediatrics*, *28*, 409-420.

Belsky J, & Pluess M. (2009). Beyond diathesis stress: Differential susceptibility to environmental influences. *Psychological Bulletin*, *135*, 885-908. doi:10.1037/a0017376

Bibok, M. B., Carpendale, J. I. M., & Müller, U. (2009). Parental scaffolding and the development of executive function. In C. Lewis & J. I. M. Carpendale (Eds.), Social interaction and the development of executive function. New Directions in Child and Adolescent Development, 123, 17–34.

Burgess, P. W., Alderman, N., Evans, J., Emslie, H., & Wilson, B. A. (1998). The ecological validity of tests of executive function. *Journal of the International Neuropsychological Society*, 4, 547-558. doi:10.1017/S1355617798466037

Burke, J. D., Pardini, D. A., & Loeber, R. (2008). Reciprocal relationships between parenting behavior and disruptive psychopathology from childhood through adolescence. *Journal of Abnormal Child Psychology*, 36, 679-692. doi: 10.1007/s10802-008-9219-7

Chan, R. K., Shum, D., Toulopoulou, T., & Chen, E. H. (2008). Assessment of executive functions: Review of instruments and identification of critical issues. *Archives of Clinical Neuropsychology*, 23, 201-216. doi:10.1016/j.acn.2007.08.010

Chaytor, N., Schmitter-Edgecombe, M., & Burr, R. (2006). Improving the ecological validity of executive functioning assessment. *Archives of Clinical Neuropsychology*, 21(3), 217-227. doi:10.1016/j.acn.2005.12.002

Chronis, A. M., Lahey, B. B., Pelham, W. E., Kipp, H., Baumann, B, & Lee, S. S. (2003). Psychopathology and substance abuse in parents of young children with ADHD. *Journal of the American Academy of Child & Adolescent Psychiatry, 42,* 1424-1432. doi: 10.1097/00004583-200312000-00009

Chronis-Tuscano, A. M. & Clarke, T. L. (2008). Integrated behavioral treatment for depressed mothers of children with ADHD. Toward a Science of Clinical Psychology: Laboratory Evaluations and Interventions. Hauppagauge, NY: Nova Science Publishers

Chronis-Tuscano, A., Clarke, T. L., O'Brien, K. A., Raggi, V. L., Diaz, Y., Mintz, A. D., & ... Lewinsohn, P. (2013). Development and preliminary evaluation of an integrated treatment targeting parenting and depressive symptoms in mothers of children with attention-deficit/hyperactivity disorder. *Journal of Consulting and Clinical Psychology*, *81*, 918-925. doi:10.1037/a0032112

Chronis-Tuscano, A., Lewis-Morrarty, E., Woods, K. E., O'Brien, K. A., Mazursky-Horowitz, H., & Thomas, S. R. (2014). Parent-Child Interaction Therapy-Emotion Development for preschoolers with attention-deficit/hyperactivity disorder. *Cognitive and Behavioral Practice.*

Chronis-Tuscano, A., Molina, B. G., Pelham, W. E., Applegate, B., Dahlke, A., Overmyer, M., & Lahey, B. B. (2010). Very early predictors of adolescent depression and suicide attempts in

children with attention-deficit/hyperactivity disorder. *Archives of General Psychiatry*, 67, 1044-1051. doi:10.1001/archgenpsychiatry.2010.127

Chronis-Tuscano, A., Raggi, V. L., Clarke, T. L., Rooney, M. E., Diaz, Y., & Pian, J. (2008). Associations between maternal attention-deficit/hyperactivity disorder symptoms and parenting. *Journal of Abnormal Child Psychology*, 36, 1237-1250. doi:10.1007/s10802-008-9246-4

Cohen, J. (1992). A power primer. *Psychological bulletin*, *112*, 155.

Conway, A., Kane, M., Bunting, M., Hambrick, Z., Wilhelm, O., & Engle, R. (2005). Working memory span tasks: A methodological review and user's guide. *Psychonomic Bulletin and Review*, 12, 769-786.

Conner, D. B., Knight, D. K., & Cross, D. R. (1997). Mothers' and fathers' scaffolding of their 2-year-olds during problem-solving and literacy interactions. *British Journal of Developmental Psychology*, *15*, 323-338. doi:10.1111/j.2044-835X.1997.tb00524.x

Crandall, A., Deater-Deckard, K., & Riley, A. W. (2015). Maternal emotion and cognitive control capacities and parenting: A conceptual framework. *Developmental Review*. doi:10.1016/j.dr.2015.01.004

Cuevas, K., Deater-Deckard, K., Kim-Spoon, J., Watson, A. J., Morasch, K. C., & Bell, M. A. (2013). What's mom got to do with it? Contributions of maternal executive function and caregiving to the development of executive function across early childhood. *Developmental Science*. doi: 10.1111/desc.12073

Cunningham, C. E., & Barkley, R. A. (1979). The interactions of normal and hyperactive children with their mothers in free play and structured tasks. *Child Development*, 50, 217-224. doi:10.2307/1129059

Deater-Deckard, K. (2000). Parenting and child behavioral adjustment in early childhood: A quantitative genetic approach to studying family processes. *Child Development*, *71*, 468-484. doi:10.1111/1467-8624.00158

Deater-Deckard, K. (2014). Family matters: Intergenerational and interpersonal processes of executive function and attentive behavior. *Current Directions in Psychological Science*, 23, 230-236. doi: 10.1177/0963721414531597

Deater-Deckard, K., Pylas, M. V., & Petrill, S. A. (1997). Parent-Child Interaction System (PARCHISY). London, UK: Institute of Psychiatry.

Deater-Deckard, K., Sewell, M. D., Petrill, S. A., & Thompson, L. A. (2010). Maternal working memory and reactive negativity in parenting. *Psychological Science*, 21, 75-79. doi:10.1177/0956797609354073

Deater-Deckard, K., Wang, Z., Chen, N., & Bell, M. (2012). Maternal executive function, harsh parenting, and child conduct problems. *Journal of Child Psychology and Psychiatry*, 53, 1084-1091. doi:10.1111/j.1469-7610.2012.02582.x

DeNavas-Walt, C., Proctor, B. D., & Smith, J. C. (2014). *Income and poverty in the United States: 2013*. United States Census Bureau.

Engle, R.W. (2002). Working memory capacity as executive attention. *Current Directions in Psychological Science*, 11, 19-23, doi: 10.1111/1467-8721.00160

Epstein, J. N., Conners, C. K., Erhardt, D., Arnold, L. E., Hechtman, L., Hinshaw, S. P., ... & Vitiello, B. (2000). Familial aggregation of ADHD characteristics. *Journal of Abnormal Child Psychology*, *28*, 585-594.

Fabiano, G. A. (2007). Father participation in behavioral parent training for ADHD: Review and recommendations for increasing inclusion and engagement. *Journal of Family Psychology*, *21*, 683-693. doi:10.1037/0893-3200.21.4.683

Fabiano, G. A., Pelham, W. E., Waschbusch, D. A., Gnagy, E. M., Lahey, B. B., Chronis, A. M., & ... Burrows-MacLean, L. (2006). A Practical Measure of Impairment: Psychometric Properties of the Impairment Rating Scale in Samples of Children With Attention Deficit Hyperactivity Disorder and Two School-Based Samples. *Journal of Clinical Child and Adolescent Psychology*, 35, 369-385. doi:10.1207/s15374424jccp3503_3

Faraone, S. V., & Doyle, A. E. (2000). Genetic influences on attention deficit hyperactivity disorder. *Current Psychiatry Reports*, *2*, 143-146.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1996). Structured Clinical Interview for DSM-IV Axis I Disorders, Patient Edition (SCID-P). New York, New York State Psychiatric Institute. *Biometrics Research*.

Flory, K., Milich, R., Lynam, D. R., Leukefeld, C., & Clayton, R. (2003). Relation between childhood disruptive behavior disorders and substance use and dependence symptoms in young adulthood: Individuals with symptoms of attention-deficit/hyperactivity disorder are uniquely at risk. *Psychology of Addictive Behaviors*, *17*, 151-158.

Frazier, T. W., Demaree, H. A., & Youngstrom, E. A. (2004). Meta-Analysis of Intellectual and Neuropsychological Test Performance in Attention-Deficit/Hyperactivity Disorder. *Neuropsychology*, 18, 543-555. doi:10.1037/0894-4105.18.3.543

Friedman, N. P., Miyake, A., Young, S. E., DeFries, J. C., Corley, R. P., & Hewitt, J. K. (2008). Individual differences in executive functions are almost entirely genetic in origin. *Journal of Experimental Psychology: General*, *137*, 201-225. doi:10.1037/0096-3445.137.2.201.

Furstenberg, F. R. (1988). Good dads-bad dads: Two faces of fatherhood. In A. J. Cherlin (Ed.). *The changing American family and public policy* (pp. 193-218). Washington, DC US: Urban Institute Press.

Gartstein, M. A., & Fagot, B. I. (2003). Parental depression, parenting and family adjustment, and child effortful control: Explaining externalizing behaviors for preschool children. *Journal of Applied Developmental Psychology*, *24*, 143-177. doi:10.1016/S0193-3973(03)00043-1

Gauvain, M. (2005). Scaffolding in socialization. *New Ideas in Psychology*, *23*, 129-139. doi:10.1016/j.newideapsych.2006.05.004

Gelman, A., & Hill, J. (2006). *Data analysis using regression and multilevel/hierarchical models*. Cambridge University Press.

Gershon, J. (2002). A meta-analytic review of gender differences in ADHD. *Journal of Attention Disorders, 5,* 143-154. doi: 10.1177/108705470200500302

Gioia, G. A., & Isquith, P. K. (2004). Ecological Assessment of Executive Function in Traumatic Brain Injury. *Developmental Neuropsychology*, 25, 135-158. doi:10.1207/s15326942dn2501&2_8

Goel, V., Grafman, J., Tajik, J., Gana, S., & Danto, D. (1997). A study of the performance of patients with frontal lobe lesions in a financial planning task. *Brain*, *120*, 1805-1822.

Gonzalez, A., Jenkins, J. M., Steiner, M., & Fleming, A. S. (2012). Maternal early life experiences and parenting: the mediating role of cortisol and executive function. *Journal of the American Academy of Child & Adolescent Psychiatry*, *51*, 673-682.

Green, M., Kern, R. S., Braff, D. L., & Mintz, J. (2000). Neurocognitive deficits and functional outcome in schizophrenia: Are we measuring the 'right stuff'?. *Schizophrenia Bulletin*, *26*, 119-136.

Gregory, C., Lough, S., Stone, V., Erzinclioglu, S., Martin, L., Baron-Cohen, S., & Hodges, J. R. (2002). Theory of mind in patients with frontal variant frontotemporal dementia and Alzheimer's disease: Theoretical and practical implications. *Brain: A Journal of Neurology*, 125, 752-764. doi:10.1093/brain/awf079d

Hammond, S. I., Müller, U., Carpendale, J. M., Bibok, M. B., & Liebermann-Finestone, D. P. (2012). The effects of parental scaffolding on preschoolers' executive function. *Developmental Psychology*, *48*, 271-281. doi:10.1037/a0025519

Harold, G.T., Leve, L.D., Barrett, D., Elam, K., Neiderhiser, J.M., Natsuaki, M.N., Shaw, D. S., &…Thapar, A. (2013). Biological and rearing mother influences on child ADHD symptoms: Revisiting the developmental interface between nature and nurture. *Journal of Child Psychology and Psychiatry*, 54, 1038-1046. doi: 10.1111/jcpp.12100

Harrison, C., & Sofronoff, K. (2002). ADHD and parental psychological distress: Role of demographics, child behavioral characteristics, and parental cognitions. *Journal of the American Academy of Child & Adolescent Psychiatry*, *41*, 703-711. doi:10.1097/00004583-200206000-00010

Harvey, E. A., Metcalfe, L. A., Herbert, S. D., & Fanton, J. H. (2011). The role of family experiences and ADHD in the early development of oppositional defiant disorder. *Journal of Consulting and Clinical Psychology*, 79, 784-795. doi: 10.1037/a0025672

Hughes, C. H., & Ensor, R. A. (2009). How do families help or hinder the emergence of early executive function?. *New Directions for Child and Adolescent Development*, *2009*, 35-50.

Johnston, C., & Chronis-Tuscano, A. (2014). Families and ADHD. In R. A. Barkley (Ed.), *Attention-deficit/hyperactivity disorder: A handbook for diagnosis and treatment* (4th ed.). New York, NY: Guilford.

Johnston, C., Mash, E. J., Miller, N., & Ninowski, J. E. (2012). Parenting in adults with attention-deficit/hyperactivity disorder (ADHD). *Clinical Psychology Review*, 32, 215-228. doi:10.1016/j.cpr.2012.01.007

Kaufman, J., Birmaher, B., Brent, D., Rao, U. M. A., Flynn, C., Moreci, P., ... & Ryan, N. (1997). Schedule for affective disorders and schizophrenia for school-age children-present and lifetime

version (K-SADS-PL): initial reliability and validity data. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*(7), 980-988.

Konrad, K., & Eickhoff, S. B. (2010). Is the ADHD brain wired differently? A review on structural and functional connectivity in attention deficit hyperactivity disorder. *Human Brain Mapping*, *31*, 904-916. doi:10.1002/hbm.21058

Landry, S. H., Smith, K. E., Swank, P. R., Assel, M. A., & Vellet, S. (2001). Does early responsive parenting have a special importance for children's development or is consistency across early childhood necessary? *Developmental Psychology*, 37, 387–403.

Lewis, C., & Lamb, M. E. (2003). Fathers' influences on children's development: The evidence from two-parent families. *European Journal of Psychology of Education: A Journal of Education and Development*, *18*, 211-228. doi:10.1007/BF03173485

Luria, A. R. (1966). Higher cortical functions in man (1st ed.). New York: Basic Books.

Manly, T., Hawkins, K., Evans, J., Woldt, K., & Robertson, I. H. (2002). Rehabilitation of executive function: Facilitation of effective goal management on complex tasks using periodic auditory alerts. *Neuropsychologia*, 40, 271-281. doi:10.1016/S0028-3932(01)00094-X

Mazursky-Horowitz, H., Bell, M. A., & Deater-Deckard, K. *The role of parental chronic stressors and executive functioning in predicting parental scaffolding.* Poster to be presented at the meeting of the Society for Research in Child Development, Philadelphia, PA (2015, March).

Mazursky-Horowitz, H., Felton, J. W., MacPherson, L., Ehrlich, K. B., Cassidy, J., & Lejuez, C. W. Chronis-Tuscano, A. (2015). Maternal emotion regulation mediates the association between adult attention-deficit/hyperactivity disorder symptoms and parenting. *Journal of Abnormal Child Psychology*, 43, 121-131. doi:10.1007/s10802-014-9894-5

McKee, L., Roland, E., Coffelt, N., Olson, A. L., Forehand, R., Massari, C., ... & Zens, M. S. (2007). Harsh discipline and child problem behaviors: the roles of positive parenting and gender. *Journal of Family Violence*, *22*, 187-196. Doi: 10.1007/s10896-007-9070-6

Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. *Cognitive Psychology*, *41*, 49-100. Doi:10.1006/cogp.1999.0734

Moritz, S., Birkner, C., Kloss, M., Jahn, H., Hand, I., Haasen, C., & Krausz, M. (2002). Executive functioning in obsessive–compulsive disorder, unipolar depression, and schizophrenia. *Archives of Clinical Neuropsychology*, *17*(5), 477-483.

National Alliance for Caregiving. (2009). Caregiving in the U.S. [Data file]. Retrieved from http://www.caregiving.org/data/Caregiving_in_the_US_2009_full_report.pdf

National Institute of Mental Health (2012, February 27). Social processes: Workshop proceedings. Retrieved from http://www.nimh.nih.gov/research-funding/rdoc/social-processes-workshop-proceedings.shtml

Neitzel, C., & Stright, A. D. (2004). Parenting Behaviours during Child Problem Solving: The Roles of Child Temperament, Mother Education and Personality, and the Problem-Solving Context. *International Journal of Behavioral Development*, *28*, 166-179.

Norman, D. A., & Shallice, T. (1986). Attention to action: Willed and automatic control of behaviour. In R. J. Davidson, G. E. Schwartz, & D. Shapiro (Eds.), Consciousness and self-regulation: Advances in research and theory (pp. 1–18). New York: Plenum.

Orvaschel, H., & Puig-Antich, J. (1987). *Schedule for Affective Disorder and Schizophrenia for School-age Children: Epidemiologic Version: Kiddie-SADS-E (K-SADS-E)*.

Owen, A., Lee, A., & Williams, H. (2000). Dissociating aspects of verbal working memory within the human frontal lobe: Further evidence for 'process-specific' model of lateral frontal organization. *Journal of Psychobiology*, 146-155.

Parke, R. D. (2000). Father involvement: A developmental psychological perspective. *Marriage & Family Review*, *29*, 43-58. doi:10.1300/J002v29n02_04

Pastor, P. N., & Reuben, C. A. (2008). Diagnosed attention deficit hyperactivity disorder and learning disability: United States, 2004-2006. *Vital and Health Statistics. Series 10, Data from the National Health Survey*, (237), 1-14.

Pelham, W. E., Fabiano, G. A., & Massetti, G. M. (2005). Evidence-Based Assessment of Attention Deficit Hyperactivity Disorder in Children and Adolescents. *Journal of Clinical Child and Adolescent Psychology*, *34*, 449-476. doi:10.1207/s15374424jccp3403_5

Pelham, W. E., Gnagy, E. M., Greenslade, K. E., & Milich, R. (1992). Teacher ratings of DSM-III—R symptoms for the disruptive behavior disorders. *Journal of the American Academy of Child & Adolescent Psychiatry*, 31, 210-218.

Pelham, W. E., & Lang, A. R. (1999). Can your children drive you to drink?: Stress and parenting in adults interacting with children with ADHD. *Alcohol Research & Health*, 23, 292-298.

Piacentini, J. C., Cohen, P., & Cohen, J. (1992). Combining discrepant diagnostic information from multiple sources: Are complex algorithms better than simple ones? *Journal of Abnormal Child Psychology*, 20, 51-63.

R Core Team (2015). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

Ramtekkar, U. P., Reiersen, A. M., Todorov, A. A., & Todd, R. D. (2010). Sex and age differences in attention-deficit/hyperactivity disorder symptoms and diagnoses: implications for DSM-V and

ICD-11. *Journal of the American Academy of Child & Adolescent Psychiatry*, *49*(3), 217-228.

Rogoff, B., Mistry, J., Goncu, A., & Mosier, C. (1993). Guided participation in cultural activity by toddlers and caregivers. *Monographs Of The Society For Research In Child Development*, *58*(8), v-179. doi:10.2307/1166109

Russell, G., & Russell, A. (1987). Mother-child and father-child relationships in middle childhood. *Child Development*, *58*, 1573-1585. doi:10.2307/1130696

Schroeder, V. M., & Kelley, M. L. (2009). Associations between family environment, parenting practices, and executive functioning of children with and without ADHD. *Journal of Child and Family Studies*, *18*, 227-235. doi:10.1007/s10826-008-9223-0

Smith, K. E., Landry, S. H., & Swank, P. R. (2000). Does the content of mothers' verbal stimulation explain differences in children's development of verbal and nonverbal cognitive skills? Journal of School Psychology, 38(1), 27–49.

Theule, J., Wiener, J., Tannock, R., & Jenkins, J. M. (2013). Parenting stress in families of children with ADHD: A meta-analysis. *Journal of Emotional and Behavioral Disorders, 21*, 3-17. doi: 10.1177/1063426610387433

Torralva, T., Gleichgerrcht, E., Lischinsky, A., Roca, M., & Manes, F. (2013). 'Ecological' and highly demanding executive tasks detect real-life deficits in high-functioning adult ADHD patients. *Journal of Attention Disorders*, 17(1), 11-19. doi:10.1177/1087054710389988

Vygotsky, L.S. 1978. In M. Cole, V. John-Steiner, S. Scribner and E. Souberman, (Eds.), *Mind in society—The development of higher psychological processes*. Cambridge: Harvard University Press.

Wang, C. H., Mazursky-Horowitz, H., & Chronis-Tuscano, A. (2014). Delivering evidence-based treatments for child attention-deficit/hyperactivity disorder (ADHD) in the context of parental ADHD. *Current Psychiatry Reports, 16*, doi: 10.1007/s11920-014-0474-8

Waschbusch, D. A. (2002). A meta-analytic examination of comorbid hyperactive-impulsive-attention problems and conduct problems. *Psychological Bulletin*, *128*, 118-150. doi:10.1037/0033-2909.128.1.118ns

Wechsler, D. (2003). Wechsler Intelligence Scale for Children – Fourth Edition: Manual. San Antonio: The Psychological Corporation.

Wechsler, D. (2008). Wechsler adult intelligence scale–Fourth Edition (WAIS–IV). *San Antonio, TX: NCS Pearson*.

Wehmeier PM, Schacht A, & Barkley RA. (2010). Social and emotional impairment in children and adolescents with ADHD and the impact on quality of life. *The Journal of Adolescent Health: Official Publication of The Society for Adolescent Medicine*, *46*, 209-17. doi:10.1016/j.jadohealth.2009.09.009

Winsler, A. (1998). Parent-child interaction and private speech in boys with ADHD. *Applied Developmental Science*, *2*, 17-39.

Woods, K. E., Mazursky-Horowitz, H., Wang, C., Zoromski, A., & Chronis-Tuscano A. (2014, November). *A preliminary examination of the relationship between child executive functioning task performance and observed behaviors in the Summer Treatment Program*. Poster to be presented at the meeting of the Association for Behavioral and Cognitive Therapies, Philadelphia, PA.