

THE INFLUENCE OF DAILY HASSLES, MATERNAL ATTRIBUTIONS,
OPTIMISM, AND CHILD SYMPTOMS ON THE MENTAL HEALTH OF MOTHERS
OF CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

by

Lucy R. Leibowitz
A Dissertation
Submitted to the
Graduate Faculty
of
George Mason University
in Partial Fulfillment of
The Requirements for the Degree
of
Doctor of Philosophy
Psychology

Committee:

_____ Director

_____ Department Chairperson

_____ Program Director

_____ Dean, College of Humanities and Social
Sciences

Date: _____ Spring Semester 2013
George Mason University
Fairfax, VA

The Influence of Daily Hassles, Maternal Attributions, Optimism, and Child Symptoms
on the Mental Health of Mothers of Children with Attention-Deficit/Hyperactivity
Disorder

A Dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy at George Mason University

by

Lucy R. Leibowitz
Bachelor of Arts
George Mason University, 2009

Director: Jerome L. Short, Associate Professor
Department of Psychology

Spring Semester 2013
George Mason University
Fairfax, VA



This work is licensed under a [creative commons attribution-noncommercial 3.0 unported license](https://creativecommons.org/licenses/by-nc/3.0/).

DEDICATION

This is dedicated to my husband Steve, who has graciously and lovingly endured and supported my academic and clinical pursuits through six years of graduate school, four years of college, and countless applications and papers. This is dedicated to my mother, Barbara, who launched me into my academic endeavors by always encouraging me to strive for success (and happiness) and be one of those impressive doctoral candidates one day. This is dedicated to my father, Edward, sister Joanna, grandmother Gammy, and parents-in-law Mindy and Edward, all of whom have been so remarkably supportive and patient throughout the years.

ACKNOWLEDGEMENTS

I would like to acknowledge and thank my advisor and dissertation chair, Dr. Jerome Short, who has provided instrumental support and mentorship throughout my training in the clinical program at George Mason University. I greatly appreciate Dr. Short's supervision and direction with both my clinical and research pursuits as well as his dedication to the clinical program. I would like to also thank the other members of my dissertation committee, Dr. Ellen Rowe and Dr. Elizabeth Chong for their guidance throughout this process.

TABLE OF CONTENTS

	Page
List of Tables	vii
List of Figures	viii
Abstract	ix
1. Introduction	1
Attention-Deficit/Hyperactivity Disorder	2
Psychological Functioning of Mothers of Children with ADHD	5
Maternal Psychological Symptoms	6
Risk Factors	10
Protective Factors	18
2. Rationale For Current Study	21
3. Hypotheses	22
Correlations	22
Longitudinal Analyses.....	22
4. Methods.....	24
Participants	24
Informed Consent and Confidentiality Procedures	26
Measures.....	27
5. Results.....	31
Preliminary Analyses of Demographic Variables	32
Correlations	33
Longitudinal Analyses.....	36
6. Discussion	50
Demographic Variables.....	50
Predictors of Mothers' Symptoms.....	51
Stress from Life Events	53
Attributions of Children's ADHD Symptoms.....	54

Optimism.....	55
Clinical Implications	56
Limitations and Future Directions.....	57
Appendices.....	59
References.....	76

LIST OF TABLES

	Page
Table	
Table 1.	31
Table 2.	32
Table 3.	34
Table 4.	35
Table 5.	39
Table 6.	40
Table 7.	42
Table 8.	44
Table 9.	46
Table 10.	47
Table 11.	49
Table 12.	49

LIST OF FIGURES

Figure	Page
Figure 1. Direct effects model of ADHD Symptoms (T1) on Anxiety Symptoms (T2) by PDH (T2).	38
Figure 2. Direct effects model of ADHD Symptoms (T1) on Depressive Symptoms (T2) by PDH (T2).	39
Figure 3. Direct effects model of ADHD Symptoms (T1) on Anxiety Symptoms (T2) by WAQ (T2).	42
Figure 4. Direct effects model of ADHD Symptoms (T1) on Depressive Symptoms (T2) by WAQ (T2).	44

ABSTRACT

THE INFLUENCE OF DAILY HASSLES, MATERNAL ATTRIBUTIONS, OPTIMISM, AND CHILD SYMPTOMS ON THE MENTAL HEALTH OF MOTHERS OF CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

Lucy R. Leibowitz, Ph.D.

George Mason University, 2013

Dissertation Director: Dr. Jerome L. Short

Attention-Deficit/Hyperactivity Disorder affects between four and eight percent of children in the United States between the ages of four and seventeen (Daley, 2006; Johnston & Mash, 2001; Ray, Croen, & Habel, 2009). Mothers of children with ADHD have been shown to experience higher levels of stress and more symptoms of depression and anxiety than mothers of children without ADHD (Befera & Barkley, 1985; Chronis et al., 2003; Fischer, 1990; Nigg & Hinshaw, 1998; Segenreich, Fortes, Coutinho, Pastura, & Mattos, 2009). This study examined children's ADHD symptom severity, stress from daily hassles, optimism, maternal attributions about children's behavior, and maternal well-being in a longitudinal design with 107 mothers. Children's externalizing behaviors (but not ADHD symptoms) were related to mothers' symptoms. Both mothers' attributional style and daily parenting stress mediated the longitudinal relationship between children's externalizing symptoms and mothers' symptoms. Additionally,

optimism added unique variance in explaining mothers' symptoms, over and above that explained by attributional style and daily parenting stress. The results suggest that interventions that focus on increasing optimism and reducing negative maternal attributions and parenting stress may improve mothers' well-being.

1. INTRODUCTION

Previous research on the relationship between mothers' and children's symptoms in populations with Attention-Deficit/Hyperactivity Disorder (ADHD) often focuses on the effect of mothers' symptoms on children with ADHD. However, given the complex relationship between mother and child symptoms, it is also important to explore the effect that children's behavior and symptoms have on mothers' mental health. This review will begin with background information and statistics on ADHD, which is a serious public health concern and can have negative effects on the families affected by the disorder. Next, the review will provide evidence and support for the relationship between child ADHD symptoms and maternal psychological symptoms. Following that, I will describe risk factors that are predictive of mental health problems in mothers of children with ADHD, including stress from daily life events, attributional style, and children's symptoms. Next, I will examine optimism, a dispositional factor related to better mental health in the general population, as a protective factor in mothers of children with ADHD. Based on this past research, I will propose hypotheses about the relations of risk and protective factors to psychological symptoms in mothers of children with ADHD.

Attention-Deficit/Hyperactivity Disorder

ADHD represents a serious public health concern and it can have lasting implications for the children and adolescents affected by the disorder and their families. Primary symptoms of the disorder include impulsivity, inattention, and hyperactivity. A diagnosis of ADHD with the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) requires at least six of nine symptoms of inattention and/or at least six out of nine symptoms of hyperactivity/impulsivity. The symptoms must appear in more than one setting, and some evidence of the disorder must appear prior to age seven. Diagnoses of ADHD are specified as predominantly inattentive type, predominantly hyperactive-impulsive type, or combined type if the criteria for both inattentive and hyperactive-impulsive are met (Association, 2000; Daley, 2006). Boys are more likely than girls to receive a diagnosis ADHD, although statistics vary with respect to how much more likely, with estimates ranging from 2:1 to 9:1 (Pelham, Wheeler, & Chronis, 1998; Root & Resnick, 2003). ADHD affects between four and eight percent of children in the United States between the ages of four and seventeen (Daley, 2006; Johnston & Mash, 2001; Ray, Croen, & Habel, 2009).

Over the past several decades, research on ADHD has expanded dramatically. Currently, research supports various etiologies of ADHD including both biological and environmental causes (Daley, 2006). Research on the biological causes of ADHD has shown that specific genes are linked to ADHD. Given the highly heritable nature of the disorder, it is not surprising that mothers of children with ADHD are more likely to have met criteria for ADHD as a child than mothers of children without the disorder (Chronis

et al., 2003). With respect to the environmental causes, research has demonstrated that providing more structured environments for children with ADHD via academic accommodations or parent skills training can help to reduce ADHD symptoms in children (Daley, 2006). It is likely that for any child, a variety of biological and environmental factors contribute to the development and maintenance of ADHD symptoms, with varying degrees of influence for each child (Johnston & Mash, 2001).

ADHD can have a significant negative impact on children who have the disorder, and problems associated with ADHD extend well into adolescence and adulthood. Approximately 78% of children diagnosed with ADHD display symptoms into adolescence, and between 40% and 60% of children diagnosed with ADHD experience symptoms of the disorder well into adulthood (Daley, 2006; Faraone, Biederman, & Mick, 2006; Mannuzza, Klein, Bessler, Malloy, & LaPadula, 1998; Robin, 1999), demonstrating the chronic and stable nature of the disorder and related symptoms and impairment. ADHD is highly associated with problems in academic settings and lower achievement in academic subjects (Daley, 2006). Childhood ADHD is associated with risky sexual behavior, substance use, risky driving behavior, and other risk taking behaviors in adolescence and adulthood (Barkley, Guevremont, Anastopoulos, DuPaul, & Shelton, 1993; Burke, Loeber, & Lahey, 2001; Flory, Molina, Pelham, Gnagy, & Smith, 2006; Hurtig et al., 2007). ADHD represents a major public health concern in many ways. Problems associated with ADHD can not only affect the families of children with ADHD but also the greater public, as research has demonstrated that ADHD represents a significant cost to the health care system. Families with a child with ADHD incur higher

emergency, primary care, psychiatric department, and pharmacy costs, and more outpatient visits than families of children without ADHD (Ray et al., 2009). Therefore, research that continues to expand the breadth of knowledge of the disorder benefits the children and families directly affected by ADHD, and the greater public.

ADHD is also a significant predictor of other mental health and behavioral problems including Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) (Daley, 2006; Hurtig et al., 2007; Robin, 1999). Mood and anxiety symptoms are more common in children and adolescents with ADHD (Robin, 1999), although results are mixed (Hurtig et al., 2007). Children who exhibit comorbid ADHD and conduct problems have more severe and persistent problems overall. Given that ADHD is highly comorbid with ODD and CD, many studies focusing on this issue include youth who may meet the criteria for ODD and CD in addition to ADHD.

Research has shown that many different treatments can be effective for children and adolescents with ADHD. Research in treatment of ADHD has greatly expanded with the Multimodal Treatment Study of Children with Attention-Deficit/Hyperactivity Disorder (MTA), a multi-site cooperative child treatment study (Arnold et al., 1997). A large body of evidence points to stimulant medication as the first line treatment for ADHD, and research has demonstrated that medication is highly effective in treating the symptoms of the disorder (Daley, 2006; Fischer, 1990; Swanson et al., 2008). Results from the MTA study indicate that medication treatment for symptoms of ADHD is more effective than behavioral treatment alone, and that even combined medication and behavioral treatment is not significantly better than just medication alone (Swanson et al.,

2008). However, some criticize the use of medication to treat ADHD in children and adolescents. Despite the efficacy of medication in treating ADHD symptoms in a large majority of children, a proportion of children diagnosed with the disorder do not respond to stimulants, and those that do may continue to show some ADHD symptoms including poorer attention or more hyperactivity than classmates (Pelham, Jr. et al., 1998). In children with mild to moderate symptoms of ADHD, behavioral or psychosocial treatments may be effective (Root & Resnick, 2003). Some research indicates that parent training and psycho-education help reduce these symptoms (Daley, 2006; Modesto-Lowe, Danforth, & Brooks, 2008; van den Hoofdakker et al., 2010).

Psychological Functioning of Mothers of Children with ADHD

Families of children with ADHD are at increased risk for problems including psychological and physical problems in other family members, family stress, and increased marital conflict and divorce rates for parents of children with ADHD (Fischer, 1990; Hurtig et al., 2007; Johnston & Mash, 2001; Wymbs et al., 2008). In particular, mothers of children with ADHD have more symptoms of psychopathology than mothers of children without ADHD (Fischer, 1990). Further, research has documented that there are greater differences between mothers of children with ADHD and those without the disorder than between fathers of children with ADHD and those without the disorder (Segenreich et al., 2009).

The relationship between ADHD in children and physical and mental health problems in mothers is multi-directional for a variety of reasons. Mothers with mental health problems are more likely to have a child diagnosed with ADHD because of genetic

factors. Further, raising a child with ADHD can lead to increased risk for physical and psychological problems due to stress from parenting. Maternal stress resulting from managing a child diagnosed with ADHD can in turn lead to less effective coping and parenting behaviors and contribute to behavior problems. In the case of children who live with biological parents, shared environmental and genetic factors contribute to the link between mothers' problems and children's ADHD symptoms (Johnston & Mash, 2001).

Other research suggests several possible relationships between mothers with mental health problems and children diagnosed with ADHD. First, mothers who are genetically predisposed to ADHD and related conditions use medical and mental health services more frequently. Second, mothers' health problems may negatively affect the child in-utero leading to a higher likelihood of the child developing ADHD. Third, mothers' medical conditions and mental health problems may negatively affect the child through its environment, including the family environment, which could lead to the development of attention problems. Last, a mother may have an increased propensity to seek services and diagnoses for herself and the child (Ray et al., 2009).

Maternal Psychological Symptoms

As previously mentioned, mothers of children with ADHD are more likely to experience psychopathology than are mothers of children without the disorder. As with other occurrences of psychopathology in mothers of children with ADHD, mood and anxiety symptoms may present due to genetic factors or heritability, or they may partially result from the stress associated with parenting a child with significant behavioral problems such as hyperactivity and inattention. When comparing mothers of children

with ADHD and mothers of children without the disorder, research has documented that mothers of children with ADHD are more likely to have lifetime histories of both mood and anxiety disorders (Befera & Barkley, 1985; Chronis et al., 2003; Nigg & Hinshaw, 1998; Segenreich et al., 2009).

Longitudinal studies are helpful for better understanding the multi-directional relationship between mothers' mood symptoms and children's ADHD symptoms. One study gathered data from mothers before the birth of children including children who later received a diagnosis of ADHD. Ray, Croen, and Habel (2009) used claims data to examine maternal mental health problems in the year before and two years after the birth of children who subsequently received diagnoses of ADHD. Results indicated that mothers of children with ADHD were more likely to receive diagnoses of depression and anxiety in the year prior to the birth of the child than were mothers of children without ADHD. Further, mothers of children with ADHD were more likely to receive diagnoses of depression and anxiety in the two years after the child's birth than were mothers of children without ADHD. This study highlights the multi-directional relationship between maternal symptoms and child ADHD diagnoses, as well as the complexity of these issues. A limitation of the study was that they did not verify the ADHD diagnoses.

Lesesne, Visser, and White (2003) examined the relationship between maternal mental health and child mental health in a population of children with ADHD and children without the disorder. The sample included over 600 children who health care professionals diagnosed with ADHD. Results indicated that mothers who had an "activity-limiting mental health condition" (Lesesne et al., 2003) were four times more

likely to have a child with ADHD. Further, mothers who had mental health problems were significantly more likely to consult with a mental health professional regarding the child than mothers with no mental health problems. As with all cross-sectional studies, it is impossible to determine the direction of the relationship between maternal mental health problems and child mental health problems. The authors assert that maternal mental health problems may precede a child's ADHD diagnosis or mothers of children with ADHD may be more likely to develop a mental health condition due to the difficulty and stress of managing a child with ADHD. Last, a child of a mother with mental health problems may be more likely to receive mental health services because of the proximity to such services.

In addition to mood symptoms, anxiety symptoms are more prevalent in mothers of children with ADHD than for mothers of children who do not have ADHD. In a sample of sixty-six parents (18 control mothers, 21 mothers of ADHD children, 12 control fathers, and 15 fathers of ADHD children), Segenreich, Fortes, Coutinho, Pastura, and Mattos (2009) compared symptoms of anxiety, depression, and ADHD in parents of children with ADHD and those with children without the disorder. The authors used the Adult ADHD Self Report Scale (ASRS) to measure maternal ADHD symptoms, the State Trait Anxiety Inventory (STAI) to measure state and trait anxiety levels, and the Beck Depression Inventory (BDI) to measure symptoms of depression. Results indicated that mothers of children with ADHD reported more symptoms of ADHD, depression, and trait-anxiety themselves than mothers of children without ADHD (Segenreich et al., 2009).

In addition to the mental health problems affecting mothers of children with ADHD, parents of children with ADHD are also more likely to experience medical conditions, and research suggests they are more likely to have alcohol and substance use problems (Chronis et al., 2003; Pelham, Jr. & Lang, 1999). Pelham and Lang (1999) reviewed the research on ADHD in children and parental alcohol consumption. The authors found that parents of children with ADHD were more likely to drink more following interactions with children with externalizing problems only if the parent had a family history of alcohol problems. Other research has also shown an increased risk for alcohol or substance problems in mothers of children with ADHD. In a study by Chronis, Lahey, Pelham, Kipp, Baumann, and Lee (2003), mothers of children with comorbid ADHD and ODD or ADHD and CD were more likely to report marginally more drinking problems than were mothers of controls. Mothers of children with ADHD +ODD/CD were significantly more likely to endorse cocaine and stimulant dependence (Chronis et al., 2003).

Given the added burden of raising a child with behavioral challenges such as ADHD symptoms, mothers of children with ADHD are at increased risk for experiencing stress and distress. Research has demonstrated that mothers of children with emotional, behavioral, and physical problems report experiencing more stress than mothers of children without any of these problems (Breen & Barkley, 1988; Mash & Johnston, 1983). Child characteristics and behaviors appear to contribute most to parental stress (Vitanza & Guarnaccia, 1999). Parents of children with ADHD experience more stress as

a result of the symptoms of the disorder than parents of children without ADHD (Baker & McCal, 1995; Fischer, 1990; Mash & Johnston, 1990).

In a small sample of mothers of children with ADHD, mothers of children with learning disorders, and mothers of children with no emotional, behavioral, or physical problems, Baker and McCal (1995) examined parental stress. Mothers completed the Child Behavior Checklist (CBCL) to assess internalizing and externalizing child symptom and the Parent and Child domains of the Parenting Stress Index (PSI), which assessed parent and child characteristics that contribute to parenting stress. Mothers of children with ADHD reported more parenting stress, specifically related to child characteristics than mothers of children with learning disorders or mothers of control children (Baker & McCal, 1995; Fischer, 1990; Mash & Johnston, 1990).

Risk Factors

Children's Symptoms. Research has demonstrated that when children display additional behavioral problems, mothers are at increased risk for psychopathology (Chronis et al., 2003; West, Houghton, Douglas, Wall, & Whiting, 1999). Given that ADHD and ODD and CD are highly comorbid, it is necessary to understand that mothers of children with comorbid ADHD and ODD or ADHD and CD may have poorer functioning. Chronis, Lahey, Pelham, Kipp, Baumann, and Lee (2003) conducted structured clinical interviews with a sample of 98 children diagnosed with ADHD, 116 children who did not meet criteria for the disorder, and the children's mothers. Sixty-eight of the children diagnosed with ADHD also met criteria for either ODD or CD as well (ADHD +ODD/CD). Mothers of children with ADHD +ODD/CD were more than

five times as likely to meet the criteria for a current episode of Major Depressive Disorder (MDD) than were mothers of children without the disorders. Mothers of children in the ADHD + ODD/CD group were also more likely to have a lifetime history of social phobia and obsessive-compulsive disorder (OCD). These relationships remained significant even after controlling for child mood and anxiety disorders, respectively (Chronis et al., 2003).

Having more than one child with ADHD and having a child who displays more ADHD symptoms (i.e., combined type) are both associated with maternal symptoms of depression. Mothers who had more than one child with ADHD reported more symptoms of depression on the BDI than mothers who had only one child with ADHD (West et al., 1999). This could be due to the added parenting stress of having more than one child with ADHD, or it could suggest that increasing levels of maternal psychopathology increases the risk of having multiple children with ADHD. Research has demonstrated that the greatest predictor of parenting distress is how challenging a mother perceives her child's behavior to be (Vitanza & Guarnaccia, 1999).

Research has shown that mothers' symptoms may differentially relate to the three different types of ADHD. West, Houghton, Doublass, Wall, and Whiting (1999) recruited a sample of eighty mothers who completed the Beck Depression Inventory (BDI) to assess maternal depressive symptoms. They collected data from each mother regarding the specific type of ADHD diagnosis her child received from her pediatrician. They assigned mothers to four different groups based on whether the child received a diagnosis of ADHD Predominantly Inattentive Type, ADHD Predominantly Hyperactive-Impulsive

Type, or ADHD Combined Type. The fourth group included mothers who had more than one child with ADHD (West et al., 1999). The authors found that mothers of children who were diagnosed with combined type ADHD showed overall higher BDI scores than mothers of children with predominantly inattentive type ADHD. This study highlights the importance of distinguishing between the symptoms that a child is displaying when examining mothers' symptoms.

Another study that examined varying levels of parental distress with two different measures also showed differences between the combined and inattentive types of ADHD. Podolski and Nigg (2001) examined role-specific distress in mothers of children with ADHD and mothers of children without the disorder. They measured role-specific distress with the Satisfaction with Parenting Performance subscale of the Parenting Satisfaction Scale (PSS) and with the Parent Distress subscale of the Parenting Stress Index-Short Form (PSI-SF). Podolski and Nigg (2001) reported that mothers of children with combined type ADHD endorsed more symptoms of distress on the PSS than did mothers of control children, while mothers of children with inattentive type ADHD were not more distressed than were mothers of children without the disorder. However, the difference between the distress levels of mothers of children with combined type ADHD and mothers of children with inattentive type was not statistically significant (Podolski & Nigg, 2001).

Stress from Life Events. Individuals can respond differently to the same stressful events. Factors that may affect how an individual responds to a given situation include his or her perception of the situation, and their available cognitive and social resources.

Lazarus and Folkman (1984) proposed that the response a person has to a stressful event depends on the individual's appraisal of the situation, namely how the person classifies the event with respect to his or her own well-being. They suggested two different types of appraisals; primary and secondary. Primary appraisal is the initial evaluation of an event, and the person's categorization of the event as either irrelevant, benign positive (i.e. a positive or joyous event), or stressful. The further divide stress appraisals into harm/loss, threat, and challenge appraisals.

Once a person assesses a situation as stressful, the individual engages in secondary appraisal, which is the process of evaluating what is possible to respond to and ameliorate the situation. Central to the secondary appraisal process is evaluating what specific type of coping will manage the situation (Lazarus & Folkman, 1984). Moreover, there are interconnected appraisals of whether an individual assesses that he or she can have control over a given situation, whether external supportive resources are available, and whether he or she is able to use adaptive coping strategies.

Mash and Johnston (1990) proposed a model of parenting stress based on theories from developmental and social psychological theories. Mash and Johnston's model posits that child characteristics, parent characteristics, and environmental characteristics are all variables which contribute to overall parenting stress (Mash & Johnston, 1990). In families with hyperactive children, child characteristics may consist of behavioral problems including hyperactivity, impulsivity, and defiant behaviors, while environmental characteristics can include negative life event or socio-economical stressors. They defined parent characteristics as maternal cognitions including

perceptions of child behavior, attributions for child behavior, and parenting self-efficacy. The authors also posited that parental attributions and parenting self-efficacy mediate the relationship between child characteristics and parental stress.

Research on parenting stress often focuses on the role of life events or hassles that specifically relate to parenting in contributing to overall parental stress. Daily hassles are irksome events that occur in an individual's life. In the case of parents, daily hassles can include negative interactions and daily tasks associated with parenting (Creasey & Reese, 1996). Some research suggests that daily hassles may play a role in the development of psychological problems by mediating the relationship between stress or more larger life events and psychological symptoms (Compas, Howell, Phares, Williams, & Ledoux, 1989; Creasey & Reese, 1996).

In ADHD populations, mothers of children with ADHD appear to experience more negative life events than mothers of children without ADHD. Barkley, Fischer, Edelbrock and Smallish (1991) conducted an eight-year follow-up of 100 adolescents with ADHD and 60 without the disorder. Among the variables assessed, the authors studied mothers' reports of negative life events, as measured by the life stress scale of the PSI. The results indicated that the mothers of adolescents with ADHD reported more stressful life events than mothers of youth without ADHD (Russell A. Barkley, Fischer, Edelbrock, & Smallish, 1991).

Other research has examined the relationship between mothers of children with ADHD experiencing negative life events and psychological distress. Anastopoulos, Guevremont, Shelton, and DuPaul (1992) examined characteristics contributing to

parental stress in a sample of 104 mothers of children with ADHD. Parents completed the CBCL and the Conners Parent Rating Scale to assess child internalizing and externalizing symptoms. They assessed maternal mental health symptoms with the SCL-90, and parental stress with the Life Stress scale of the PSI. The family environment variables examined, including the life stress scale, did not account for significant variance in mothers' reported stress (Anastopoulos, Guevremont, Shelton, & DuPaul, 1992).

Using the model proposed by Mash and Johnston (1990), Vitanza and Guarnaccia (1999) examined the role that child, parent, and environmental characteristics have on parental distress. The authors recruited 103 mothers of boys diagnosed with ADHD. The construct of Parenting Stress was constituted by factors including children's ADHD symptoms, child behaviors and interactions with the parent (measured by the PSI and the Parenting Daily Hassles Scale), and daily parenting tasks (measured by the Parenting Daily Hassles Scale). Mothers' perceived child behavior problems, as rated by mothers on the Parenting Daily Hassles Scale, were the strongest indicator of Parenting Stress. This suggests that beyond children's ADHD symptoms, the factor that most contributed to mothers' distress was mothers' perceptions of the children's behavior problems. Additionally, Parenting Stress was directly associated with psychological distress, as measured by the Parental Distress subscale of the PSI (Vitanza & Guarnaccia, 1999).

Parental Attributions of Children's ADHD Symptoms. Previous research indicates that parents' attributions of children's behavior contributes to parents' responses to their behavior. These attributions can affect the emotional reaction and behavioral response of a parent and subsequently affect the parent-child relationship (Harrison &

Sofronoff, 2002; Hoza et al., 2000; Johnston & Freeman, 1997). Measures used to study parental attributions of children's behavior typically assess rational, or situational beliefs, and schema driven attributions about the cause of the behavior. The latter type of attributions are more automatic, or trait-like (Johnston & Ohan, 2005).

While there are many measures to assess overall attributional style in adults, there are very few empirically supported measures that assess parents' attributions of children's behaviors, rather than general attributional style. Harrison and Sofronoff (2002) conducted a study of 100 mothers and their children. The authors were interested in the roles that severity of child behavioral symptoms and parent cognitions have on parental psychological distress. They measured parental cognitions with the Attributions of Symptoms Inventory (ASI) to assess whether parents attributed children's behavior to internal causes, external causes, or mixed internal/external causes. They assessed parent's knowledge of ADHD with the Test of ADHD Knowledge. They measured parents' psychological distress with the parenting domain of the PSI (Harrison & Sofronoff, 2002). Mothers who perceived they had low levels of control over the child's behavior reported more stress and depression. Knowledge of ADHD was correlated with perceived parental control; mothers with less knowledge of ADHD perceived themselves as having less control over the child's behavior. However, knowledge of ADHD was not associated with parental psychological distress (Harrison & Sofronoff, 2002). It is important to note that the authors questioned the reliability of the measure used to assess knowledge of ADHD. The fact that low perceived parental control was associated with parenting stress is consistent with the theory of learned helplessness.

Chen, Seipp, and Johnston (2008) further explored parents' attributions about children's behavior. The authors used the Written Analogue Questionnaire to assess parents' causal attributions of children's inattentive and impulsive symptoms based on written narratives. They used the ADHD Beliefs Scale to assess parental beliefs regarding causes and treatments of the disorder including Belief in Behavior Management, Belief in Medication, and Belief in Psychological Causes/Treatments. Results indicated that when parents perceived a child's behavior as described in narratives as global and stable, they were more likely to have negative response to the child's behavior. Parents assigned an internal locus of control to inattentive behaviors, and an external locus of control to impulsive behaviors. On the ADHD Beliefs Scale, mothers were more likely than fathers to endorse Belief in Behavior Management and less likely to endorse Belief in Psychological Causes/Treatments (Chen, Seipp, & Johnston, 2008).

Other research has used a combination of video clips and vignettes to assess parental attributions of children's behavior. In a sample of 23 children with ADHD and their mothers and 29 children without ADHD and their mothers, Gerdes and Hoza (2006) had mothers read vignettes about children engaging in compliant, noncompliant, inattentive-impulsive, and prosocial behavior, and watch videotapes of both their children and other children engaging in each of these behaviors. Results indicated that mothers of children with ADHD perceived noncompliance and inattentive-impulsive behavior as less controllable, and would experience more negative affect than mothers of children without ADHD perceived (Gerdes & Hoza, 2006).

Studies have also demonstrated that parental cognitions and attributions predict child behavior and treatment outcome. A smaller study used a subset of families who participated in the Multimodal Treatment Study of Children with ADHD to examine the relationship between parental attributions and child response to treatment (Hoza et al., 2000). The researchers recruited 105 children who met criteria for ADHD, Combined Type and their parents (100 mothers and 57 fathers). Parents completed several measures regarding their cognitions about themselves, their child, and their parenting. Children of parents who attributed children's noncompliance to the child's lack of effort or bad mood had poorer treatment outcomes (Hoza et al., 2000).

Protective Factors

Optimism. Not all mothers of children with ADHD develop mental health problems. Even in mothers who may be more predisposed biologically toward developing their own mental health or physical problems, certain coping strategies may serve to protect against developing mental health problems. Adaptive coping in particular can help diminish the negative effects of stress. Lazarus and Folkman (1984) defined coping as the efforts (both cognitive and behavioral) that an individual uses to deal with stressors. Lazarus and Folkman asserted that coping is a constantly changing response to internal and environmental stressors, rather than a static trait (Lazarus & Folkman, 1984; Monat & Lazarus, 1991). While coping is a response to one's environment, there are likely more stable personality traits that relate to coping, such as optimism, which may reduce the chance of experiencing mental health problems. Scheier and Carver (1985) defined optimism as a stable set of beliefs that good things, rather than bad things, will

happen, and theoretically, optimism is likely associated with approach, or active coping (Carver, Scheier, & Weintraub, 1989). Optimists generally have a favorable outlook on life (Scheier & Carver, 1985). Optimism is similar to Lazarus and Folkman's (1984) concept of problem-focused coping, which deals with attempting to work through different solutions to problems (Lazarus & Folkman, 1984; Scheier, Weintraub, & Carver, 1986). In addition to the stress and coping literature, cognitive theory is helpful for understanding the link between optimism and well-being. Optimistic expectations may lead to more accessible schemas of success, which may result in differences in attending to and interpreting and responding to information from the environment (Seegerstrom, 2001).

Although no research to date has examined optimism as a protective factor for mothers of children with ADHD, researchers have examined dispositional optimism as a resistance factor for parents of children with chronic illness. Fotiadou, Barlow, Powell, and Langton (2008) focused on parents of children with cancer. The authors included 100 parents of children with cancer and 117 parents of healthy children. Parents completed the Life Orientation Test-Revised (LOT-R) to measure dispositional optimism and the Hospital Anxiety and Depression Scale to measure parental symptoms of anxiety and depression. Results indicated that for both the parents of children with cancer and the parents of healthy children, optimism was negatively correlated with symptoms of anxiety and depression (Fotiadou, Barlow, Powell, & Langton, 2008).

Research has also supported optimism as a protective factor for parents of children with developmental delays. Baker, Blacher, and Olsson (2005) compared 214

parents of three-year-old children with and without developmental delays. Parents completed measures including the Lot Orientation Test (LOT) to measure dispositional optimism, and the Center for Epidemiologic Studies Depression Scale (CES-D) to measure symptoms of depression. The authors were interested in the relationship between optimism and parental well-being, as well as whether optimism moderated the relationship between child problems and parental well-being. Results indicated that optimism was associated with all measures of well-being, including a negative correlation with symptoms of depression. For mothers, optimism moderated the relationship between child behavior problems and parental well-being; children's symptoms had a less negative effect on mothers with high levels of optimism. The authors posited that optimism is theoretically not a mediator, given that optimism is a trait. However, they also conducted exploratory analyses to determine whether optimism did mediate the relationship between child and parent symptoms. Mediation was not supported, indicating that the effect of child symptoms on parent symptoms was not due to decreased parental optimism (Baker, Blacher, & Olsson, 2005).

2. RATIONALE FOR CURRENT STUDY

Previous studies have examined the relationship between some of the predictor variables of children's symptoms, daily hassles, attributional style, and optimism with mothers' psychological symptoms, but no study has included all of these predictors together in a longitudinal design. Moreover, the measures used in the current study are more relevant to families of children with ADHD than most measures used in previous studies. The primary goal of this study is to examine the relationship between each of these risk and protective factors and mental health of mothers of children with ADHD over time. Theory and previous research has supported both daily hassles and attributional style as mediator variables, and both will be examined as separate mediators of the relationship between children's and mothers' symptoms (Compas et al., 1989; Luby, Belden, & Spitznagel, 2006; Mash & Johnston, 1990). Given the dearth of research on optimism in mothers of children with ADHD, another goal of this study is to understand what variance optimism explains beyond the variables of daily hassles, child symptoms, and attributional style. Additionally, a goal of this study is to understand what effect changes in each of the predictors over time have on mothers' symptoms of depression and anxiety.

3. HYPOTHESES

Correlations

1. Mothers' reports of severity of children's ADHD symptoms, as measured by the Disruptive Behavior Disorder Scale (DuPaul et al., 1998; Pelham, Evans, Gnagy, & Greenslade, 1992) will correlate positively with their reports of their own psychological symptoms including symptoms of depression and anxiety, as measured by the Depression Anxiety Stress Scales-21 (DASS-21) (Lovibond & Lovibond, 1995).

Longitudinal Analyses

2. Mothers' reports of children's ADHD symptoms (Time 1) will predict mothers' symptoms of depression and anxiety (Time 2).
3. Stress from life events, as measured by the PDH, will mediate the longitudinal relation between children's symptoms of ADHD and mothers' symptoms of depression and anxiety.
4. Mothers' attributional style, as measured by the WAQ, will mediate the longitudinal relation between children's symptoms of ADHD and mothers' symptoms of depression and anxiety.
5. ADHD related daily stress, as measured by items added to the PDH specifically for this study, will explain additional variance in mothers'

symptoms of depression and anxiety, beyond non-ADHD daily stress, as measured by the PDH.

6. Optimism will explain additional variance in mothers' symptoms of depression and anxiety, beyond the variance explained by daily hassles and attributional style.

4. METHODS

Participants

Participants were 107 mothers of children (ages 5 to 12) who previously received diagnoses of ADHD in the community. A sample size of 92 was recommended for a regression analysis with five predictors in order to detect a moderate effect size ($f^2=0.15$), for a power of 0.8 at an alpha of 0.05 (Cohen, 1992). The effect size is assumed to be moderate (0.15) and this combined with the desired risk of Type I and Type II error contributed to the sample size determination.

Only mothers were recruited, given that research has demonstrated differences between mothers and fathers in reports of the variables examined in this study (Chen et al., 2008). Mothers' ages ranged from 24 to 54 (mean=36.3 years). With respect to race or ethnicity, 93.5 percent of mothers identified themselves as White, 2.8 percent as African American or Black, and 2.8 percent as Hispanic. One mother (.9 percent) identified herself as Asian American. A large majority of the sample was married (86 percent), while 5.6 percent were divorced, 4.7 percent never married, and 3.7 percent identified as separated. With respect to education level, 2.8 percent did not graduate from high school, 5.6 percent graduated from high school, 26.2 percent attended some college or technical school, 43 percent graduated from college, and 22.4 percent attended graduate school. Approximately three quarters of mothers reported employment outside the home (77.6 percent) and 22.4 percent reported no employment outside the home.

Family income was subdivided into 6 categories; 2.8 percent reported earning under \$20,000, 9.3 percent endorsed earning between \$20,000 and \$40,000, 19.6 percent indicated earning between \$40,000 and \$60,000, 29 percent reported earning between \$60,000 and \$80,000, 18.7 percent indicated earning between \$80,000 and \$100,000, and 20.6 percent reported earning greater than \$100,000. With respect to mothers' psychological histories, 26 percent reported they were currently in therapy, half (54.2%) reported past therapy, 29.9% reported a psychiatric diagnosis, and 20.6% reported use of medication for psychiatric symptoms.

Mothers also reported their children's demographic information. Children's ages ranged from 5-12 (mean=8.5 years), and 62.6 percent were male. With respect to race or ethnicity, 88.8 percent of mothers identified their child's race as White, 3.7 percent as Hispanic, 2.8 percent as Asian American, and 1.9 percent as African American/Black. An additional 2.8 percent identified their child's race as "Other." A large majority of children lived with both biological parents (82.2 percent), while 15 percent lived with at least one biological parent, and 2.8 percent live with someone other than their biological parent.

Mothers also reported on children's ADHD related history. The mean age that mothers first noted their children's ADHD symptoms was 4.5 years, and children's first diagnosis with ADHD was an average of 5.5 years. Mothers reported that 70% were diagnosed by a pediatrician, 53% by a psychologist, and 15.9% by a psychiatrist. With respect to specific ADHD diagnoses received, 31.8% indicated predominantly inattentive and 37.4% reported predominantly hyperactive/impulsive. An additional 30.8% of mothers reported their children had received a diagnosis of combined type. Half of the

sample (50.5%) was on medication to treat ADHD symptoms. Thirty mothers (28%) reported their child had received other diagnoses in addition to ADHD.

Mothers were recruited through flyers posted in community treatment centers, and through online list serves including through CHADD (Children and Adults with Attention Deficit Disorder) organization chapters. Mothers received 10 dollars for participation after they completed surveys at both Time 1 and Time 2 via an e-mailed \$10 Amazon gift card or a check or money order in the mail. All data was collected through Limesurvey, and mothers completed the surveys roughly one month after the initial survey.

Informed Consent and Confidentiality Procedures

Participants completed informed consent and the subsequent measures via Limesurvey. After accessing the link to the Limesurvey page, participants first read the informed consent that described the study, the risks and benefits of participating in the study, and confidentiality. The informed consent stated that mothers needed to complete the surveys at two different time points. Mothers electronically consented to participate in the study or declined. Mothers were informed that participation was voluntary and that if they chose not to participate it would not affect their child's treatment or evaluation. Once mothers consented to participate in the study, they accessed the online measures. Participants were assigned a token ID that did not contain any of their identifiable information.

Measures

Mothers completed measures of demographic variables, child ADHD and behavioral symptoms, stress from daily life events, maternal attributions, maternal psychological symptoms (depression and anxiety), and optimism. The measures were administered in that order. All measures were pilot tested prior to the start of the study.

Children's Behavior Symptoms. Children's symptoms were assessed with the Disruptive Behavior Disorders Rating scale (DBD) (Pelham et al., 1992). The DBD measures DSM-III and DSM-IV symptoms of ADHD, ODD, and CD in children, based on parental report. Parents respond by indicating how well each of 45 statements characterized the child on a four point likert scale (not at all, just a little, pretty much, or very much). The scale can help diagnosis children and to rate symptom severity by averaging items from different categories (i.e., nine items assessed inattention and nine items measured hyperactivity/impulsivity, eight items assessed ODD symptoms, and 15 items assessed CD symptoms). This measure is for parents or teachers, but only mothers responded to the items. In previous research, alpha coefficients for ADHD, ODD, and CD were .96, .96, and .81, respectively (Pelham et al., 1992). In the present study, alpha coefficients for ADHD, ODD, and CD symptoms were .90, .86, and .93, respectively. In exploratory analyses, the current study also separated hyperactivity (.83) and inattention (.89) symptoms, as well as a separate externalizing scale (.88) including ODD, CD, and hyperactivity/impulsivity symptoms.

Stress from Life Events. Mothers' stress from life events was measured with the Parenting Daily Hassles (PDH) scale. The PDH is a 20-items scale by Crnic and

Greenberg (1990) that assessed the frequency and intensity of daily hassles experienced by parents, specific to their role as parents. Parents rated each of the 20 questions on two separate likert scales. Parents used a 5-point likert scale to assess how frequently the hassle occurred during the past 6 months (never, rarely, sometimes, a lot, constantly). Then they used a separate 5-point likert scale to assess the intensity of each hassle from *low* (1) to *high* (5). Researchers sum the ratings across all items for the total scores. Crnic and Greenberg (1990) reported that Cronbach's alpha was .81 for the frequency scale and .90 for the intensity scale and that the two scales are highly correlated with one another ($r=.79$). The present study used only the frequency of hassles rating to assess the overall occurrence of these stressful events rather than mothers' perceptions of the intensity of the events. Eight items were added to measure stressful daily hassles that occur for parents of children with ADHD. The eight items were worded similarly to the items on the original PDH (Crnic & Greenberg, 1990) and described situations in which children exhibited symptoms of inattention or hyperactivity-impulsivity, as detailed in both the DSM-IV and ADHD specific rating scales (Association, 2000; DuPaul et al., 1998). Cronbach's alpha for the original scale in the present study was .90 at both Time 1 and Time 2. Cronbach's alpha for the new ADHD related stress items was .86 at both Time 1 and Time 2.

Mothers' Attributions of Children's Behavior. In order to assess mothers' attributions of children's behavior, they completed the Written Analogue Questionnaire (WAQ) (Johnston & Freeman, 1997). In this measure, mothers received brief vignettes to imagine that their children were described in the vignettes. The measure assessed

mothers' causal attributions for children's ADHD related behavior, including inattentive and impulsive scenarios. Mothers read five scenarios that described behavior associated with ADHD symptoms, including five with inattentive behavior and five with impulsive behavior. After reading each scenario, parents imagined that their children engaged in the behavior. Parents rated the cause of the child's behavior on 10-point likert scales to assess causal locus (1=something about other people/situation to 10 = something about the child), globality (1 = specific to this situation to 10= happens in many situations), stability (1 = a one-time thing to 10 = will happen again in the future), and control (1 = not at all within his control to 10=completely within his control). Consistent with previous research, ratings were averaged for each scale across the different scenarios. In previous studies, researchers combined globality and stability when they were highly correlated. Cronbach's alphas for the averaged scores from a previous study were good for both impulsive scenarios (locus = 0.71, globality/stability = 0.89, control = 0.91) and the inattentive scenarios (locus = 0.77, globality/stability = 0.90, control = 0.89) (Chen et al., 2008). In another study, Cronbach's alphas for the averaged scores were also good (ranging from 0.80 to 0.82) (Johnston, Seipp, Hommersen, Hoza, & Fine, 2005). Cronbach's alphas for the averaged scores from the current study were good at Time 1 (Locus = 0.87, Control=.91, and Globality/Stability = 0.92) and Time 2 (Locus = 0.92, Control=.92, and Globality/Stability = 0.92).

Optimism. Parents completed the Life Orientation Test-Revised (LOT-R) (Scheier, Carver, & Bridges, 1994) to measure dispositional optimism. Participants responded to statements on a 5-point likert scale from 1 (strongly disagree) to 5 (strongly

agree) assessing the extent to which they are optimistic. Six of ten items including statements such as, “In uncertain times, I usually expect the best,” made up the total score. Previous research has demonstrated internal good consistently (.80). In the present study, Cronbach’s alpha was .79 at Time 1 and .75 at Time 2.

Maternal Anxiety and Depression. The Depression Anxiety Stress Scales-21 (DASS-21) is a short form of a 42-item measure developed by Lovibond and Lovibond (1995) to assess self-report symptoms of depression, anxiety, and stress. Participants responded to each of the 21 items on how much the given statement was true for them over the past week on a 4-point likert scale ranging from *did not apply to me at all* (0) to *applied to me very much, or most of the time* (3) (Lovibond & Lovibond, 1995). Previous research has demonstrated that the DASS-21 possesses psychometric properties similar to that of the full version of the DASS (Antony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005). The DASS-21 contains three scales of seven items each that measure symptoms of depression, anxiety, and stress. Cronbach’s alphas for the DASS-21 subscales ranged from .87 to .94. The three subscales correlate with other measures of depression and anxiety (Antony et al., 1998; Henry & Crawford, 2005). In the current study, only the depression and anxiety scales were completed. Given that there is no total scale for the DASS-21 for anxiety and depression symptoms together, the scales of depression and anxiety symptoms were kept separate. Cronbach’s alphas at .84 for anxiety and .83 for depression at Time 1, and .87 for anxiety and .86 for depression at Time 2.

5. RESULTS

Descriptive statistics for the major variables included in the study are presented in Table 1 (Time 1) and Table 2 (Time 2). Means, standard deviations, possible ranges, and observed ranges were calculated for each variable and are presented in the tables.

Table 1.
Description of Self-Report Variables at Time 1. (N=107)

Variable	Mean	SD	Observed Range	Possible Range
DASS Anxiety	11.40	8.73	0.00-30.00	0.00-63.00
DASS Depression	13.76	8.58	0.00-32.00	0.00-63.00
DBD ADHD	2.71	0.58	2.00-4.00	1.00-4.00
DBD	2.67	0.62	1.00-4.00	1.00-4.00
Hyperactivity/Impulsivity				
DBD Inattention	2.76	0.69	2.00-4.00	1.00-4.00
DBD Externalizing	2.18	0.42	1.00-3.00	1.00-4.00
PDH	63.36	13.09	36.00-100.00	20.00-100.00
WAQ Locus	7.05	1.35	4.00-10.00	1.00-10.00
WAQ Control	7.03	1.47	3.00-10.00	1.00-10.00
WAQ Globality/Stability	6.73	1.37	5.00-10.00	1.00-10.00
LOT-R	18.89	4.90	7.00-30.00	6.00-30.00

Table 2.

Description of Self-Report Variables at Time 2 (N=107)

Variable	Mean	SD	Observed Range	Possible Range
DASS Anxiety	10.86	9.05	0.00-36.00	0.00-63.00
DASS Depression	11.66	8.84	0.00-42.00	0.00-63.00
PDH	62.07	12.70	35.00-100.00	20.00-100.00
WAQ Locus	7.06	1.48	4.00-10.00	1.00-10.00
WAQ Control	6.96	1.49	3.00-10.00	1.00-10.00
WAQ Globality/Stability	6.67	1.34	5.00-10.00	1.00-10.00
LOT-R	16.66	4.42	9.00-27.00	6.00-30.00

Preliminary Analyses of Demographic Variables

In order to test for potential confounding variables, Pearson's correlations, Independent Samples T-Tests, and One-Way Anovas were first conducted to examine whether the demographic variables (i.e., parent and child age, child gender, ethnicity, family income, marital status, and mothers' level of education, and children's medication status) were significantly related to mothers' symptoms of anxiety and depression. Mothers' age was negatively correlated with both symptoms of anxiety ($r=-.36, p<.01$) and depression ($r=-.22, p<.05$). Also, children's age was negatively correlated with mothers' symptoms of anxiety ($p=-.24, p<.05$). Mothers of girls reported higher symptoms of anxiety ($M=14.3, SD=9.09$) than mothers of boys ($M=9.67, SD=8.09$), $t(105) = -2.73, p<.01$. In addition, mothers of children who were not taking medication reported higher symptoms of anxiety ($M=16.57, SD=7.27$) than mothers of children taking medication ($M=6.33, SD=6.91$), $t(105) = 7.46, p<.01$. Mothers of children who were not taking medication also reported higher symptoms of depression ($M=17.58,$

SD=6.87) than mothers of children taking medication ($M=10.00$, $SD =8.49$), $t(105) = 5.08$, $p<.01$. These analyses, along with conceptual theory, were used to determine which variables would be controlled for in later analyses. No other demographic variables were related to the outcome variables.

Pearson's correlations, Independent Samples T-Tests, and One-Way Anovas were also conducted to examine whether the demographic variables previously mentioned related to the predictor variables of children's symptoms, daily life stress, attributional style, and level of optimism. Results suggested that mothers' age was negatively associated with children's externalizing symptoms ($r=-.36$, $p<.01$) and positively associated with WAQ causal locus ($r=.32$, $p<.01$) and WAQ globality/stability ($r=.28$, $p<.01$). Children's age was also positively associated with WAQ causal locus ($r=.25$, $p<.01$) and globality/stability ($r=.19$, $p<.05$). Mothers of children who were taking medication reported higher ADHD symptoms on the DBD, higher ratings of control attributions on the WAQ (i.e., higher ratings attributing scenarios to be within children's control), and higher globality/stability attributions on the WAQ (i.e., higher ratings attributing scenarios to be occurring in many situations and to happen again in the future).

Correlations

Pearson Correlations were used to determine the relationships between each of the predictor and outcome variables, and are presented in Table 3. Given the longitudinal design of this study, Pearson correlations were also calculated between children's symptoms of ADHD (Time 1) and the other outcome variables (Time 2) (See Table 4).

Table 3.

Pearson Correlations of Variables Related to Mothers' and Children's Psychological Symptoms at Time 1 (N=107)

	A	B	C	D	E	F	G	H	I	J	K
a) ANX	-	.74**	-.19*	-.01	-.33**	.53**	.16	-.43**	-.22*	-.51**	-.37**
b) DEP		-	-.14	.00	-.24*	.39**	.21*	-.34**	-.21*	-.39**	-.53**
c) ADHD			-	.88**	.90**	.37**	.62**	.38**	.19*	.59**	-.02
d) HYP/ IMP				-	.58**	.62**	.59**	.21*	.18	.43**	-.12
e) INN					-	.07	.51**	.46**	.17	.62**	.07
f) EXT						-	.46**	-.22*	-.01	-.04	-.35**
g) PDH							-	.11	.13	.29**	-.28**
h) WAQ1								-	.58**	.59**	.26**
i) WAQ2									-	.32**	.19*
j) WAQ3										-	.06
k) OPT											-

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

- a) DASS-21 Anxiety Symptoms
- b) DASS-21 Depressive Symptoms
- c) Disruptive Behavior Disorder Scale (DBD) ADHD Symptoms
- d) DBD Hyperactivity/Impulsivity Symptoms
- e) DBD Inattention Symptoms
- f) DBD Externalizing Symptoms (Hyperactivity/Impulsivity, Oppositional Defiant, and Conduct symptoms)
- g) Parenting Daily Hassles
- h) Written Analogue Questionnaire (WAQ) Causal Locus
- i) WAQ Control
- j) WAQ Globality/Stability
- k) Life Orientation Test-Revised

Table 4.
Pearson Correlations of Relationship between Children's Psychological Symptoms (Time 1) and Outcome Variables (Time 2) (N=107)

	A	B	C	D	E	F	G	H
a) Anxiety	-	.81***	-.17	.23*	-.52***	-.20*	-.45***	-.45***
b) Depression		-	-.17	.25**	-.44***	-.20*	-.46***	-.42***
c) ADHD (T1)			-	.37***	.33***	.15	.44***	-.02
d) PDH				-	.07	.03	.16	-.35***
e) WAQ1					-	.50***	.64***	.27**
f) WAQ2						-	.29	.22*
g) WAQ3							-	.11
h) Optimism								-

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

- a) DASS-21 Time 2 Anxiety Symptoms
- b) DASS-21 Time 2 Depressive Symptoms
- c) Disruptive Behavior Disorder Scale (DBD) Time 1 ADHD Symptoms
- d) Parenting Daily Hassles Time 2
- e) Written Analogue Questionnaire (WAQ) Causal Locus Time 2
- f) WAQ Control Time 2
- g) WAQ Globality/Stability Time 2
- h) Life Orientation Test-Revised Time 2

ADHD Symptoms. The first hypothesis predicted that, at baseline, mothers' reports of severity of children's ADHD symptoms, as measured by the ADHD items on the DBD (DuPaul et al., 1998; Pelham et al., 1992) would correlate positively with their reports of their symptoms of depression and anxiety, as measured by the DASS-21 (Lovibond & Lovibond, 1995) at baseline. Pearson's correlations were used to test this hypothesis. Results indicated that children's ADHD symptoms (Time 1) were not significantly correlated with mothers' symptoms of depression (Time 1), and they were significantly, but negatively correlated with mothers' symptoms of anxiety at Time 1 ($r = -$

.19, $p < .05$). To further understand these relationships, separate analyses explored correlations between the different types (i.e., hyperactivity/impulsivity and inattention) of ADHD symptoms. Children's symptoms of hyperactivity were not significantly correlated with mothers' symptoms of anxiety or depression, but symptoms of inattention were negatively correlated with mothers' symptoms of anxiety ($r = -.33$, $p < .01$) and depression ($r = -.24$, $p < .05$).

Externalizing Behavior Symptoms. Additional analyses were conducted to explore whether children's externalizing symptoms (i.e., hyperactivity/impulsivity, ODD, and CD symptoms) were correlated with mothers' symptoms of depression and anxiety. Results indicated that externalizing behavior symptoms were significantly correlated with mothers' symptoms of anxiety ($r = .53$, $p < .01$) and depression ($r = .39$, $p < .01$).

Longitudinal Analyses

ADHD Symptoms. Hypothesis 2 stated that mothers' reports of children's ADHD symptoms (Time 1) would predict mothers' symptoms of depression and anxiety (Time 2). Based on results of demographic analyses noted above, mothers' age, children's age, children's gender, and medication status were controlled in these analyses when anxiety was the dependent variable and mothers' age and medication status were controlled when depression was the dependent variable. Separate multiple regression analyses were conducted to test the relationship between children's ADHD symptoms (Time 1) and mothers' symptoms of depression and anxiety (Time 2). After accounting for demographic variables, there were no significant relationships between total ADHD symptoms and mothers' symptoms of depression or anxiety. Further, there were no

significant relationships between inattention and hyperactivity symptoms with either mothers' symptoms of depression or anxiety.

Life Stress. Hypothesis 3 predicted that stress from life events, as measured by the PDH, would mediate the longitudinal relationship between children's symptoms of ADHD and mothers' symptoms of depression and anxiety. Several different approaches exist in the literature with respect to testing mediation. Baron and Kenny's (1986) four-step procedure requires a series of multiple regression analyses indicating 1) a significant relationship between the IV and the DV, 2) a significant relationship between the IV and the mediator, 3) a significant relationship between the mediator and the DV, and 4) the effect of the IV on the DV is no longer significant when adding the mediator back into the regression analyses (Baron & Kenny, 1986; Preacher & Hayes, 2004). More recently, research has supported the bootstrapping method given that it does not require assumptions of normal distribution, and provides better results with respect to statistical power and Type I error (Hayes & Preacher, 2010; Rucker, Preacher, Tormala, & Petty, 2011). Further, literature on bootstrapping indicates that a direct relationship between the independent and dependent variables is not necessary in order for mediation to exist (Hayes, 2009). The path from the independent to dependent variables is known as the total effect, and the path from the independent to dependent variables with an intervening mediator is known as the direct effect. The relationship between the independent and dependent variables through the mediator is known as the indirect effect. If zero does not fall within the confidence intervals (CI) around the indirect effect, than mediation is supported (Hayes, 2009). Bootstrapping is conducted through computerized methods of

generating numerous (i.e., 5000) datasets from the original data through random sampling with replacement. The current study used SPSS macro to compute the analyses.

Anxiety. The path from ADHD symptoms (Time 1) to Parenting Daily Hassles (Time 2) was statistically significant with an unstandardized regression coefficient $b = 8.07$ (1.97), $p < .001$, as was the path from Parenting Daily Hassles (Time 2) to Mothers' Anxiety (Time 2) ($b = .24$, $se = .07$, $p < .001$). The total effect was $b = -2.62$ (1.50), $p > .05$, and the direct effect was $b = -4.57$ (1.53), $p < .01$ (See Figure 1).

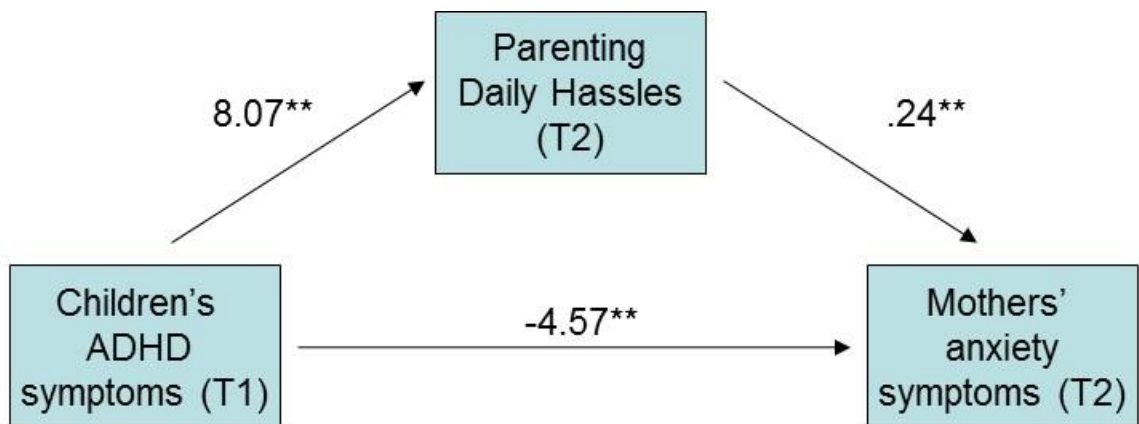


Figure 1. Direct effects model of ADHD Symptoms (T1) on Anxiety Symptoms (T2) by PDH (T2). Values represent unstandardized regression coefficients. * $p < .05$ ** $p < .01$

The indirect effect was $b = 1.95$ ($se = .99$) and 95% Confidence Intervals (CI): [.56, 4.54]. Thus, results indicate that the indirect effect is statistically different from zero given that zero does not fall within the confidence intervals. As such, results indicate that parenting daily stress (Time 2) mediates the relationship between children's symptoms of

ADHD (Time 1) and mothers' symptoms of anxiety (Time 2) (See Table 5). The strength of the effect of the mediating path was medium ($K^2=.13$).

Table 5.

Simple mediation of indirect effect of children's ADHD symptoms (Time 1) on mothers' symptoms of anxiety (Time 2) through parenting daily hassles (Time 2) (5,000 bootstrap samples).

	Point estimate	95% CI	
		Lower	Upper
Parenting Daily Hassles	1.95	.56	4.54

Depression. The path from ADHD symptoms (Time 1) to Parenting Daily Hassles (Time 2) was statistically significant with an unstandardized regression coefficient $b = 8.07$ (1.97), $p < .001$, as was the path from Parenting Daily Hassles (Time 2) to Mothers' Depression (Time 2) ($b = .25$, $se = .07$, $p < .001$). The total effect was $b = -2.61$ (1.46), $p > .05$, and the direct effect was $b = -4.65$ (1.48), $p < .01$ (See Figure 2).

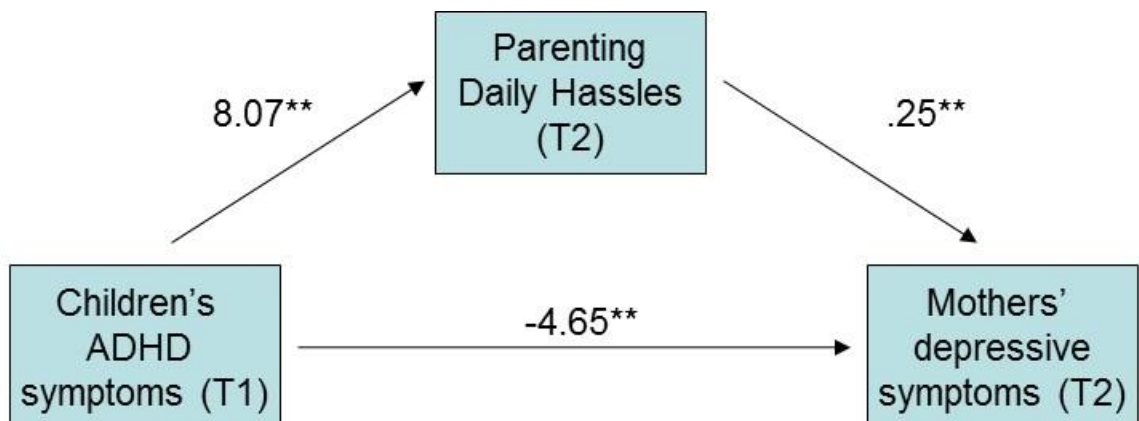


Figure 2. Direct effects model of ADHD Symptoms (T1) on Depressive Symptoms (T2) by PDH (T2). Values represent unstandardized regression coefficients. * $p < .05$ ** $p < .01$

The indirect effect was $b = 2.04$ ($se = .82$) and 95% (CI): [.76, 4.08]. As such, results indicate that parenting daily stress (Time 2) mediates the relationship between children's symptoms of ADHD (Time 1) and mothers' symptoms of depression (Time 2) (See Table 6). The strength of the effect of the mediating path was medium ($K^2 = .14$).

Table 6.
Simple mediation of the indirect effect of children's ADHD symptoms (Time 1) on mothers' symptoms of depression (Time 2) through parenting daily hassles (Time 2) (Time 2) (5,000 bootstrap samples).

	Point estimate	95% CI	
		Lower	Upper
Parenting Daily Hassles	2.04	.76	4.08

Attributional Style. Hypothesis 4 predicted that attributional style, as measured by subscales of the WAQ, would mediate the longitudinal relationship between children's symptoms of ADHD and mothers' symptoms of depression and anxiety.

Anxiety. The direct path from ADHD symptoms (Time 1) to WAQ Causal Locus (Time 2) was statistically significant with an unstandardized regression coefficient $b = .85$ (.23), $p < .001$, as was the path from WAQ Causal Locus (Time 2) to Mothers' Anxiety (Time 2) ($b = -3.19$, $se = .54$, $p < .001$). The total effect was $b = -2.62$ (1.49), $p > .05$, and the total direct effect was $b = .09$ (1.38), $p > .05$ (See Figure 3). The total indirect effect was $b = -2.72$ ($se = .71$) and 95% (CI): [-4.32, -1.51]. Results indicate that the indirect effect is statistically different from zero, indicating support for WAQ Causal Locus (Time 2) as a mediator between children's symptoms of ADHD (Time 1) and

mothers' symptoms of depression (Time 2) (See Table 7). The strength of the effect of the mediating path was medium ($K^2=.18$).

The direct path from ADHD symptoms (Time 1) to WAQ Control (Time 2) was not statistically significant, nor was the path from WAQ Control (Time 2) to Mothers' Anxiety (Time 2). Further, the total effect and direct effect paths were not significant. Finally, zero was contained within the confidence interval for the indirect effect (See Table 7). As such, mediation was not supported.

The direct path from ADHD symptoms (Time 1) to WAQ Globality/Stability (Time 2) was statistically significant with an unstandardized regression coefficient $b = 1.02 (.20)$, $p < .001$, as was the path from WAQ Globality/Stability (Time 2) to Mothers' Anxiety (Time 2) ($b = -3.17$, $se = .66$, $p < .001$). The total effect was $b = -2.62 (1.50)$, $p > .05$, and the direct effect was $b = .60 (1.52)$, $p > .05$ (See Figure 3). The total indirect effect was $b = -3.22 (se = .84)$ and 95% CI $[-5.21, -1.88]$. Results indicate the indirect effect is statistically different from zero thus supporting mediation. Results indicate that WAQ Globality/Stability (Time 2) mediates the relationship between children's symptoms of ADHD (Time 1) and mothers' symptoms of anxiety (Time 2) (See Table 7). The strength of the effect of the mediating path was large ($K^2=.20$).

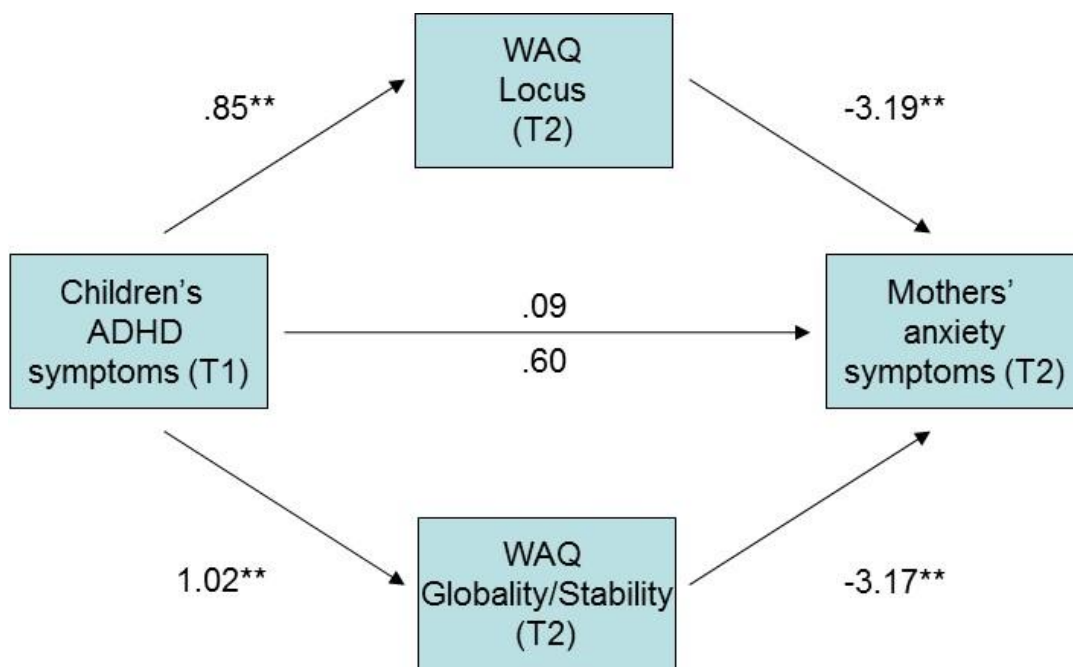


Figure 3. Direct effects model of ADHD Symptoms (T1) on Anxiety Symptoms (T2) by WAQ (T2). Values represent unstandardized regression coefficients. * $p < .05$ ** $p < .01$

Table 7.
Simple mediation of indirect effects of children's ADHD symptoms (Time 1) on mothers' symptoms of anxiety (Time 2) through attributional style (Time 2) (5,000 bootstrap samples).

	Point estimate	95% CI	
		Lower	Upper
Written Analogue Questionnaire			
Causal Locus	-2.72	-4.32	-1.51
Control	-.41	-1.60	.06
Globality/Stability	-3.22	-5.21	-1.88

Depression. The direct path from ADHD symptoms (Time 1) to WAQ Causal Locus (Time 2) was statistically significant with an unstandardized regression coefficient $b = .85 (.23)$, $p < .001$, as was the path from WAQ Causal Locus (Time 2) to Mothers'

Depression (Time 2) ($b = -2.59$, $se = .56$, $p < .001$). The total effect was $b = -2.61$ (1.46), $p > .05$, and the total direct effect was $b = -.39$ (1.42), $p > .05$ (See Figure 4). The total indirect effect was $b = -2.21$ ($se = .77$) and 95% (CI): [-4.11, -.99]. Results indicate that the indirect effect is statistically different from zero given that zero does not fall within the confidence intervals. As such, results support WAQ Causal Locus (Time 2) as a mediator between children's symptoms of ADHD (Time 1) and mothers' symptoms of depression (Time 2) (See Table 8). The strength of the effect of the mediating path was medium ($K^2 = .15$).

The direct path from ADHD symptoms (Time 1) to WAQ Control (Time 2) was not statistically significant, nor was the path from WAQ Control (Time 2) to Mothers' Depression (Time 2). Further, the total effect and direct effect paths were not significant. Finally, zero was contained within the confidence interval for the indirect effect (See Table 8). As such, mediation was not supported.

The direct path from ADHD symptoms (Time 1) to WAQ Globality/Stability (Time 2) was statistically significant with an unstandardized regression coefficient $b = 1.02$ (.20), $p < .001$, as was the path from WAQ Globality/Stability (Time 2) to Mothers' Depression (Time 2) ($b = -3.17$, $se = .64$, $p < .001$). The total effect was $b = -2.61$ (1.46), $p > .05$, and the total direct effect was $b = .61$ (1.47), $p > .05$ (See Figure 4). The indirect effect was $b = -3.22$ ($se = .91$) and 95% CI [-5.40, -1.80]. Thus, results indicate that the indirect effect is statistically different from zero given that zero does not fall within the confidence intervals. As such, results indicate that WAQ Globality/Stability (Time 2) mediates the relationship between children's symptoms of ADHD (Time 1) and mothers'

symptoms of anxiety (Time 2) (See Table 8). The strength of the effect of the mediating path was large ($K^2=.20$).

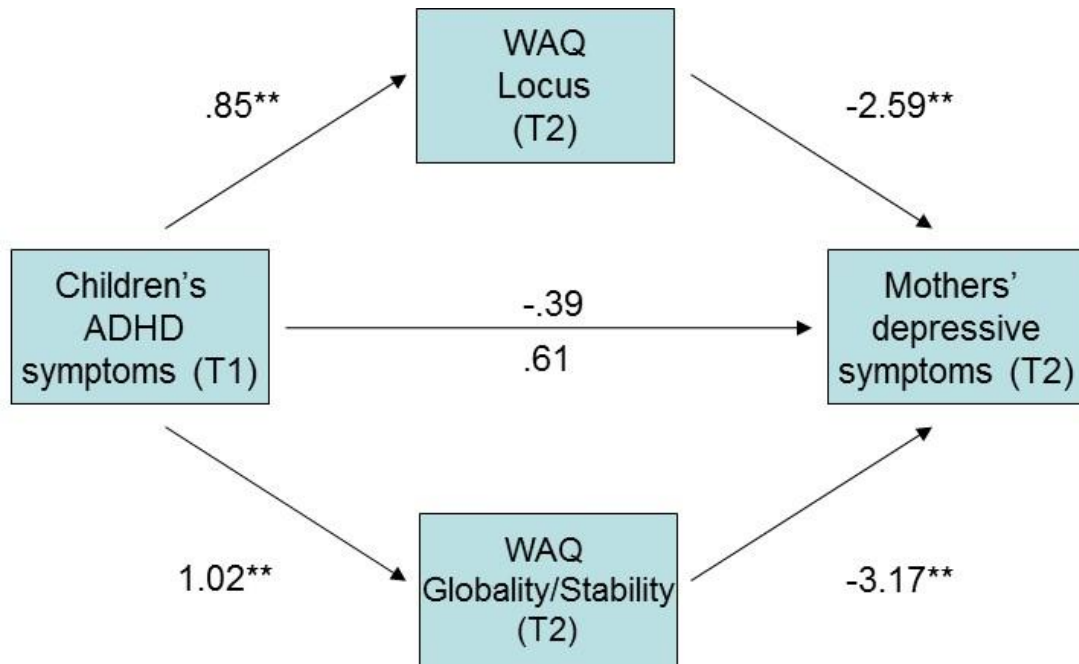


Figure 4. Direct effects model of ADHD Symptoms (T1) on Depressive Symptoms (T2) by WAQ (T2). Values represent unstandardized regression coefficients. * $p < .05$ ** $p < .01$

Table 8.

Simple mediation of the indirect effect of children's ADHD symptoms (Time 1) on mothers' symptoms of depression (Time 2) through attributional style (Time 2) (5,000 bootstrap samples).

	Point estimate	95% CI	
		Lower	Upper
Written Analogue Questionnaire			
Causal Locus	-2.21	-4.11	-.99
Control	-.41	-1.70	.07
Globality/Stability	-3.22	-5.40	-1.80

ADHD-Specific Daily Stress. Hypothesis 5 predicted that mothers' reported daily stress about managing children's ADHD symptoms would explain additional variance in mothers' symptoms of depression and anxiety, beyond non ADHD daily stress, as measured by the PDH. This hypothesis related to items created specifically for this study written in the same format as other items on the PDH. Hierarchical multiple regression was used to examine the relationship between ADHD-specific PDH items (Time 1) and mothers' symptoms of depression and anxiety (Time 1) while controlling for the original PDH items and related demographic variables. Analyses were conducted separately for the different dependent variables; mothers' symptoms of anxiety and mothers' symptoms of depression. Mothers' and children's ages, children's gender, and medication status were entered into Step 1, explaining 37% of the variance in mothers' symptoms of anxiety. After entry of the original PDH items (Time 1), the total model accounted for 38.5% of variance in mothers' symptoms of anxiety. Finally, after entry of ADHD-specific PDH items (Time 1), the total variance explained by the model as a whole was 47.50% for anxiety, $F(6, 100) = 15.09, p < .01$. The ADHD-specific PDH items explained an additional 9% of the variance in mothers' symptoms of anxiety after controlling for the other predictor variables, R squared change = .09, F change (1, 100) = 17.18, $p < .01$. (See Table 9). For depression, mothers' ages and children's medication status were entered into Step 1, explaining 19.90% of the variance in mothers' symptoms of depression. After entry of the original PDH items (Time 1), the total model accounted for 23.30% of variance in mothers' symptoms of depression. Finally, after entry of

ADHD-specific PDH items (Time 1), the total variance explained by the model as a whole was 25.70% for depression, $F(4, 102) = 8.82, p < .01$. The ADHD-specific PDH items explained an additional 2.4% of the variance in mothers' symptoms of depression after controlling for the other predictor variables, R squared change = .02, F change (1, 102) = 3.25, $p = .07$ (See Table 10). The results provided partial support for hypothesis five given that it was significant with respect to symptoms of anxiety but not depression.

Table 9.
Hierarchical Regression
ADHD-specific PDH items predicting anxiety

DASS Anxiety (T1)			
Predictor Variables	R2 Change	F Change	Beta
Step 1.	.37	14.98	
Mothers' Age			-.14
Child Gender			.09
Child Age			.03
Medication Status			-.52**
Step 2.	.02	2.45	
PDH (T1)			.13
Step 3.	.09	17.18	
ADHD-specific PDH (T1)			-.54**

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

Table 10.
Hierarchical Regression
ADHD-specific PDH items predicting Depression

DASS Depression (T1)			
Predictor Variables	R2 Change	F Change	Beta
Step 1.	.20	12.89	
Mothers' Age			-.04
Medication Status			-.43**
Step 2.	.04	4.67	
PDH (T1)			.19*
Step 3.	.02	3.25	
ADHD-specific PDH (T1)			-.27

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

Optimism. Hypothesis 6 predicted that optimism would explain additional variance in mothers' symptoms of depression and anxiety, beyond the variance explained by daily hassles and attributional style. Hierarchical multiple regression was used to examine the relationship between optimism (Time 1) and the correlated predictors of daily hassles (Time 1) and the three types (causal locus, control, globality/stability) of attributional style (Time 1) while controlling for demographic variables. Analyses were conducted separately for the different dependent variables; mothers' symptoms of anxiety and mothers' symptoms of depression. Analyses for anxiety were conducted first, and mothers' and children's age, children's gender, and medication status were entered into Step 1, explaining 37% of the variance in mothers' symptoms of anxiety. After entry of daily hassles (Time 1) and attributional styles (Time 1), the total model accounted for 48.90% of variance in mothers' symptoms of anxiety. Finally, after entry of mothers'

optimism (Time 1), the total variance explained by the model as a whole was 52.1% for anxiety, $F(9, 97) = 11.72$, $p < .01$. Optimism explained an additional 3.2% of the variance in mothers' symptoms of anxiety after controlling for the other predictor variables, R squared change = .03, F change (1, 97) = 6.45, $p < .05$ (See Table 11). For symptoms of depression as the dependent variable, mothers' age and children's medication status were first entered into Step 1, explaining 19.90% of the variance in mothers' symptoms of depression. After entry of daily hassles (Time 1) and attributional styles (Time 1), the total model accounted for 33.70% of variance in mothers' symptoms of depression. Finally, after entry of mothers' optimism (Time 1), the total variance explained by the model as a whole was 47.80% for depression, $F(7, 106) = 12.97$, $p < .01$. Optimism explained an additional 14.10% of the variance in mothers' symptoms of depression after controlling for the other predictor variables, R squared change = .14, F change (1, 99) = 26.79, $p < .01$ (See Table 12). Optimism explained an additional 3% of the variance in mothers' symptoms of anxiety and 14% of the variance in mothers' symptoms of depression, after controlling for the other predictor variables. The results provided support for hypothesis six.

Table 11.
Hierarchical Regression
Optimism predicting Anxiety

DASS Anxiety (T1)			
Predictor Variables	R2 Change	F Change	Beta
Step 1.	.37	14.98	
Mothers' Age			-.14
Children's Age			.03
Gender			.09
Medication Status			-.52**
Step 2.	.12	5.71	
PDH (T1)			.26**
WAQ Causal Locus (T1)			-.04
WAQ Control (T1)			-.09
WAQ Globality/Stability (T1)			-.33**
Step 3.	.03	6.45	
LOT-R (T1)			-.20*

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

Table 12.
Hierarchical Regression
Optimism predicting Depression

DASS Depression (T1)			
Predictor Variables	R2 Change	F Change	Beta
Step 1.	.20	12.89	
Mothers' Age			-.04
Medication Status			-.43**
Step 2.	.14	5.22	
PDH (T1)			.32**
WAQ Causal Locus (T1)			-.02
WAQ Control (T1)			-.12
WAQ Globality/Stability (T1)			-.32**
Step 3.	.14	26.79	
LOT-R (T1)			-.42**

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

6. DISCUSSION

The primary focus of this study was to examine the role of risk (children's ADHD and externalizing behavior symptoms, stress from daily hassles, and attributional style) and protective factors (optimism) on the mental health of mothers of children who have previously received ADHD diagnoses. Previous research implicates children's ADHD symptom severity, stress from life events, maternal attributions, and optimism in impacting overall maternal well-being. This section begins by addressing the primary demographic covariates, namely gender, medication status, mothers' age, and children's age, which were controlled for in longitudinal analyses. Then, the discussion addresses the relationship between the predictor variables and the outcome variables of mothers' symptoms, based on correlation results. Next, it discusses the longitudinal relationship between symptoms, including the role of daily life stress and attributional style as potential mediators. Finally, this section concludes with clinical implications of the present study as well as limitations and future directions.

Demographic Variables

Gender. Results from the present study found that symptoms of anxiety varied based on child's gender. Specifically, mothers of girls reported higher symptoms of anxiety than mothers of boys. Previous research has demonstrated gender differences with respect to the fact that boys are more likely than girls to be diagnosed with ADHD

(Pelham, 1998; Root & Resnick, 2003). It is possible that the expression of ADHD symptoms across genders affected mothers differentially, contributing to the fact that mothers of girls demonstrated higher levels of anxiety than mothers of boys. For example, normalizing boys' but not girls' ADHD symptoms may contribute to mothers' anxiety.

Medication Status. Previous research has demonstrated that medication treatment for ADHD symptoms is the most effective course of action, even as effective as combined medication and behavioral treatment (Swanson et al., 2008). Analyses in the present study indicated that mothers of children who were not taking medication reported higher symptoms of anxiety and depression than mothers of children who were taking medication. Given the documented effects of medication at targeting children's symptoms, these results may lend further support to the efficacy of medication in targeting ADHD and other externalizing behavior, not just for the child's benefit, but also for overall family functioning. It is important to note that confounding variables may include the characteristics of the families who seek medication, including mothers' use of medication to target their own mood or anxiety symptoms.

Predictors of Mothers' Symptoms

ADHD Symptoms. There was no support for the hypothesis that children's symptoms of ADHD would significantly correlate with mothers' symptoms of depression. However, there was a negative correlation between children's ADHD symptoms and mothers' symptoms of anxiety cross-sectionally, but not longitudinally. Previous research has demonstrated that increased child symptoms are associated with

increased maternal psychopathology (Chronis et al., 2003; West et al., 1999). The lack of those findings in this study could be due to a number of factors, including the fact that a community sample was used, and that mothers were asked to self-report that their child had been previously diagnosed with ADHD in the community. The current study did not independently interview parents and children to confirm the previously made diagnoses, as some previous studies have done. Additionally, the current sample displayed significant externalizing behavior, including symptoms of ODD and CD. It is possible that in light of mothers reporting these significant behavioral symptoms, the symptoms of inattention and hyperactivity that are central to ADHD diagnoses were rated as less severe.

Exploratory analyses examined the differences between symptoms of inattention and hyperactivity, the two key components of ADHD diagnoses. Those results indicated that symptoms of hyperactivity were not related to mothers' symptoms of anxiety or depression. However, symptoms of inattention were negatively correlated with mothers' symptoms of anxiety and depression, indicating that mothers with higher levels of anxiety and depression were more likely to report that children had fewer symptoms of inattention. It is important to note that mothers were simultaneously reporting on both their symptoms and their children's symptoms. As such, it is possible that when experiencing and reporting their own significant symptoms of anxiety and depression, children's symptoms of inattention seemed less severe or apparent to mothers.

Externalizing Behavior Symptoms. The relationship between ADHD and other behavioral diagnoses (i.e., ODD and CD) has been well documented in the literature, and

children who have comorbid ADHD and conduct problems demonstrate more stable and persistent problems (Daley, 2006; Hurtig et al., 2007; Robin, 1999). In the present study, exploratory analyses indicated that externalizing symptoms (i.e., hyperactivity/impulsivity, ODD, and CD symptoms), were significantly correlated with mothers' symptoms of anxiety and depression. This is consistent with previous research that mothers of children with comorbid ADHD and ODD or CD were more than five times as likely to meet the criteria for Major Depressive Disorder (Chronis et al., 2003). Based on the current study, it seems that the more severe externalizing behavior symptoms are more likely to affect mothers' functioning than are the symptoms of inattention and hyperactivity alone.

Stress from Life Events

Longitudinal Analyses. The present study examined the role of stress from life events as a mediator between children's symptoms of ADHD and mothers' mood and anxiety symptoms. Previous studies have shown support for daily hassles as a mediator between larger life events and development of psychological symptoms (Compas et al., 1989; Creasey & Reese, 1996). Results from bootstrapping analyses indicated that parenting daily stress mediated the longitudinal relationship between children's ADHD symptoms and mothers' symptoms of anxiety and depression. Results indicated that children's ADHD symptoms affect mothers' symptoms of anxiety and depression through adding additional life stress. Previous research had found mixed results; some research had found that daily hassles predicted parenting stress and psychological distress, while other research indicated that life stress did not account for significant

variance in mothers' reported stress (Anastopoulos et al., 1992; Vitanza & Guarnaccia, 1999).

Cross-Sectional Analyses. Given that the measure used to assess daily life stress was general, and not specifically related to ADHD, the study used 8 unique ADHD-specific items written in the same style as the other items on the PDH. The hypothesis predicted that ADHD-related daily stress would explain additional variance in mothers' symptoms of depression and anxiety, beyond non-ADHD daily stress. This was supported with respect to mothers' symptoms of anxiety, but not with respect to depression. Pearson's correlation analyses confirmed a relationship between general life stress and mothers' symptoms of depression, but not over and above the variance contributed by general daily stress. The relationships among stress, anxiety, and depression are similar to previous research documenting that daily hassles reported by mothers was a predictor of parenting stress and psychological distress (Vitanza & Guarnaccia, 1999).

Attributions of Children's ADHD Symptoms

The current study tested three types of attributional styles (attributions of causal locus, attributions of control, and attributions of globality/stability) as mediators in the relationship between children's symptoms and mothers' symptoms. Previous research demonstrates a link between attributional style (i.e., perceived control of children's behavior and attributions about whether behaviors are global and stable) and mothers' and children's symptoms (Chen et al., 2008; Harrison & Sofronoff, 2002).

Results from bootstrapping analyses supported causal attributions and attributions about globality/stability of behavior as mediators between children's symptoms of ADHD and mothers' symptoms of anxiety and depression after one month. Specifically, whether mothers thought behaviors were caused by the child or other individuals and whether they thought the behaviors occurred in many situations or were an isolated situation were the vehicles through which children's symptoms affected mothers. This is inconsistent with previous research, which demonstrated that parental negative affect increases when viewing children's behavior as caused by internal, rather than external factors (Harrison & Sofronoff, 2002; Johnston & Ohan, 2005). The results of the current study are, however consistent with previous research that attributions of children's behavior contributes to overall parental stress and symptoms of depression (Harrison & Sofronoff, 2002). The current study contributes to the literature on maternal cognitions and attributions by finding support for two specific types of attributions as a mediator between children's and mothers' symptoms.

Optimism

The current study hypothesized that optimism would serve as a protective factor, and account for additional variance in mothers' symptoms of depression and anxiety, above and beyond that accounted for by other variables measured (i.e., attributional style and daily life stress). Results supported this hypothesis, and indicated that optimism explained additional variance in mothers' symptoms of anxiety and depression, beyond that accounted for by demographic variables, attributional style, and mothers' daily stress. These results are consistent with previous research linking optimism with

measures of wellbeing, and correlating negatively with symptoms of anxiety and depression (Baker et al., 2005; Fotiadou et al., 2008).

Clinical Implications

This study found support for the hypothesis that parenting daily stress and attributional styles (causal locus and globality/stability) mediate the relationship between children's symptoms of ADHD and mothers' symptoms of depression and anxiety. Consistent with previous research, attributional style, specifically mothers' beliefs about whether children's behavior was caused by them or by others and whether the behaviors would likely occur in many situations in the future, explained the relationship between children's symptoms of ADHD and mothers' symptoms of anxiety and depression.

Results did not indicate a significant relationship between children's ADHD symptoms and mothers' symptoms of depression, and results indicated a negative relationship between children's symptoms of ADHD and mothers' symptoms of depression. However, mediation analyses indicated that mothers' and children's symptoms are related through the variables of daily stress and mothers' attributions about their children's behavior. The relationship between children's and mothers' symptoms is dynamic rather than linear, and this highlights the importance of involving the entire family in treatment of children with ADHD and other externalizing behavior diagnoses. This further suggests that family interventions may help reduce life stress in the family system. Clinicians can also use cognitive-behavioral techniques to help decrease negative attributions in order to improve family functioning. Lastly, given that optimism accounted for additional variance in explaining the relationship between children's and

mothers' symptoms, clinicians should also focus on protective factors such as increasing mothers' optimism.

Limitations and Future Directions

While this study had significant strengths, including the breadth of variables assessed, a large sample size, and the longitudinal study design, it also had several limitations. As previously mentioned, this study included children who were taking medication and those who were not, primarily in order to gain a large, inclusive sample. Given the results for medication status, future studies would benefit from restricting the population to either children on medication or those not medicated, or increase the sample size to be able to compare differences between the two groups. Additionally, ADHD diagnoses were not independently verified in this study. As such, based on the items endorsed by mothers, the sample was more representative of children with oppositional behavior problems rather than solely ADHD symptoms.

A primary limitation of the current study was the use of online surveys. Previous research has supported that these methods allow for reaching more participants, saving time, and reducing overall costs to researchers, but it also includes significant disadvantages as well (Wright, 2005). Limitations included sampling bias with respect to self-selection. Additionally, with online measures it is difficult to ensure participants only complete the survey once. All participants were paid after completing the survey twice. As such, there was an external motivation for individuals to want to participate in the study.

Another limitation of the current study is the use of only self-report measures from mothers and not from children or from teachers. Best practice for diagnosing children's behavioral problems includes using multiple informants (i.e., child and teacher reports as well). Future studies should further explore the mechanisms by which attributional style, optimism, and ADHD-specific daily stress in children affect mothers' psychological adjustment.

APPENDICES

Appendix A: Demographic Items

Date of Birth: (dd/mm/yyyy)

____/____/____

I am: Male Female

My age is _____

My child is Male Female

My child's age is _____

My race or ethnic background:

African American/Black

White

Hispanic

Asian American

Other

My child's race or ethnic background:

African American/Black

White

Hispanic

Asian American

Other

My marital status is

____ Married

____ Separated

____ Divorced

____ Widowed

____ Never Married

My education level is

____ did not graduate from high school

____ graduated from high school

____ attended some college or technical school

____ graduated from college

____ attended graduate school

My child's other parent's education level is

____ did not graduate from high school

____ graduated from high school

____ attended some college or technical school

____ graduated from college

____ attended graduate school

My child lives with

____ both biological parents

____ one biological parent

_____ someone other than parent

I am currently employed outside the home _____ yes _____ no

My family's yearly income is:

_____ Under \$20,000

_____ Between 20,000 and 40,000

_____ Between 40,000 and 60,000

_____ Between 60,000 and 80,000

_____ Between 80,000 and 100,000

_____ Over 100,000

When did you first notice symptoms of ADHD? _____

Who diagnosed your child with ADHD? (Check all that apply):

____ Physician/Pediatrician ____ Psychologist _____ Psychiatrist ____ Other (please

write in)

When was your child first diagnosed with ADHD? _____

What specific ADHD diagnosis did your child receive?

_____ ADHD-predominantly inattentive type

_____ ADHD- predominantly hyperactive/impulsive type

_____ ADHD- predominantly combined type

Is your child currently taking medication to treat ADHD symptoms? _____

If so, what medications and what doses?

How often does your child take his or her ADHD medication?

When was your child last off of ADHD medication?

How long has s/he been taking medication to treat ADHD symptoms?

How well do you think your child's ADHD medication controls his or her ADHD symptoms? ___Not at all ___Just a little _____Pretty much ___Very much

Have any of the other children in the household been diagnosed with ADHD?_____

Has your child ever been diagnosed with any disorders other than ADHD? _____

If yes, what disorders?

Has your child had a physical exam in the last year?_____

Are you currently receiving counseling/therapeutic services?

Yes___ No___

If yes, how many hours in the past month have you received services? _____ (hrs)

Have you ever received counseling/therapeutic services?

Yes___ No___

Have you ever been diagnosed with a psychiatric disorder?

Yes___No___

Are you currently taking psychiatric medication?

Yes___No___

What was the greatest stressor for you in the past month? (open response)

What was your preferred way of coping with this stressor in the past month?

(open response)

Is there anything else you would like to describe that would help us understand your experience? (open response)

Appendix B: Parent Disruptive Behavior Disorders Rating Scale

Check the column that best describes your child.

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 C: Parenting Daily Hassles Scale (PDH)

The statements below describe lots of events that routinely occur in families with young children. These events sometimes make life difficult. Please read each item, and circle how often it happens to you (never, rarely, sometimes, a lot, or constantly) If you have more than one child these events can include any of all or your children.

BE SURE TO MAKE TWO RATINGS (CIRCLE TWO NUMBERS) FOR EACH QUESTION:

HOW OFTEN IT HAPPENS: 1 (never), 2(rarely), 3(sometimes), 4(a lot), 5(constantly)

- 1 Continually cleaning up messes of toys or food.
- 2 Being ragged, whined at, complained to.
- 3 Mealtime difficulties (picky eaters, complaining, etc.)
- 4 The kids don't listen—won't do what they are asked without being nagged.
- 5 Babysitters are difficult to find.
- 6 The kid's schedules (e. g., preschool, school, naps, other activities) interfere with meeting your own or household needs.
- 7 Sibling arguments or fights, which require a "referee".
- 8 The kids demand that you entertain or play with them.
- 9 The kids resist or struggle over bedtime with you.

- 10 The kids are constantly under foot, interfering with other chores.
- 11 The need to keep a constant eye on where the kids are and what they're doing.
- 12 The kids interrupt adult conversations or interactions.
- 13 Having to change your plans because of an unpredicted child need.
- 14 The kids get dirty several times a day requiring changes of clothes.
- 15 Difficulties getting privacy (e.g., like in the bathroom).
- 16 The kids are hard to manage in public (grocery store, shopping center, restaurant).
- 17 Difficulties in getting kids ready for outings and leaving on time.
- 18 Difficulties in leaving kids for a night out or at school or daycare.
- 19 The kids have difficulties with friends (e.g., fighting, trouble getting along, or no friends available).
- 20 Having to run extra errands to meet kids' needs.

Appendix C (continued): ADHD items added to PDH

1. Having to sit with kids to finish homework so they pay attention and don't make careless mistakes
2. The kids are forgetful in daily activities (missing things, forget to bring these to or from school)
3. Having to remind kids to complete homework or chores
4. The kids fidget, squirm, run, or climb excessively when it's inappropriate
5. Continually needing to remind kids to play quietly
6. The kids are disorganized.
7. The kids are impatient and can't wait for their turn
8. Constantly feeling like I'm being interrupted by my kids

Appendix D: Written Analogue Questionnaire

Scenarios:

1. Your child and the family are having breakfast. He wants some ketchup on his hash browns but the ketchup is very slow coming out of the bottle. Your child doesn't wait for it to run slowly, and as he carelessly shakes the bottle, the ketchup spurts out onto the toast on your plate.
2. Your child is getting ready for school. He starts to change out of his pajamas, but when you tell him you are ready to drive him to school, you find he is only partly dressed. You leave late for work because you have to wait for your child to finish getting ready.
3. Your child is going through the hall closet looking for his bike helmet. When he can't find it, he runs to where you are busy talking on the telephone. He keeps tapping you on the back and interrupting to ask you to help him find the helmet.
4. As you walk out to the car to leave for work, you remind your child to give his teacher a note you wrote explaining that he must leave class early for a dentist appointment. Your child says he lost the note, so you have to go back into the house to write another one.
5. Your child and the family are sitting at the kitchen table. There is an outdoor field trip scheduled for that day and you are listening for the weather forecast on the radio. Just as the weather comes on, your child begins to talk loudly about a song he heard on the radio.
6. You and your child sit down to watch a movie on TV. You ask your child for the remote control so you can set the VCR to tape the show for your cousin. Your child was the last person to use the remote, but he set it down somewhere and now doesn't know where he put it.
7. You are in the kitchen doing the dinner dishes. Your child brings some dirty cups to the sink where you are washing dishes. Instead of gently placing the cups in the sink, he drops them in as he walks by, and the soapy water splashes all over you.

8. Your child is in the living room cleaning up his toys because you have company over. He starts to pick up some toys, but doesn't finish the task. When your company arrives and you have to go to the living room, there are still toys scattered about.
9. You are busy making a cake in the kitchen. Your child constantly interrupts you to ask questions about a project he is working on at the table. He distracts you so often that you forget some of the ingredients for the cake.
10. You ask your child to gather up his library books because they are due that day. Your child starts to gather some books. But, when you are ready to drive him to the library, you see that your child got distracted and did not finish gathering all his books.

Questions:

1. To what extent was your child's behavior was caused by something about him or her versus something about other people or the situation?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10

something about other
people/the situation

something about the
child

2. To what extent was your child's behavior caused by something within his or her control?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10

Not at all within
his or her control

completely within
his or her control

3. To what extent is the reason your child behaved as he or she did something that happens in many situations versus something that is specific to this situation?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10

Specific to

happens in

this situation

many situations

4. To what extent is the reason your child behaved as he or she did something that is a one time thing or something that is likely to happen again in the future?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10

a one time

will happen again

thing

in the future

Appendix E: Depression and Anxiety scales from the Depression, Anxiety and Stress Scale (DASS-21)

Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all

1 Applied to me to some degree, or some of the time

2 Applied to me to a considerable degree, or a good part of time

3 Applied to me very much, or most of the time

1. I was aware of dryness of my mouth
2. I couldn't seem to experience any positive feeling at all
3. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)
4. I found it difficult to work up the initiative to do things
5. I experienced trembling (e.g., in the hands)
6. I was worried about situations in which I might panic and make a fool of myself
7. I felt that I had nothing to look forward to
8. I felt down-hearted and blue
9. I felt I was close to panic
10. I was unable to become enthusiastic about anything
11. I felt I wasn't worth much as a person

12. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)
13. I felt scared without any good reason
14. I felt that life was meaningless

Appendix F: LOT-R

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer.

1 = Strongly Disagree, 2= Disagree, 3=Neutral, 4=Agree, 5= Strongly Agree

1. In uncertain times, I usually expect the best.
2. It's easy for me to relax.
3. If something can go wrong for me, it will.
4. I'm always optimistic about my future.
5. I enjoy my friends a lot.
6. It's important for me to keep busy.
7. I hardly ever expect things to go my way.
8. I don't get upset too easily.
9. I rarely count on good things happening to me.
10. Overall, I expect more good things to happen to me than bad.

REFERENCES

- Amirkhan, J. H. (1990). A factor analytically derived measure of coping: The Coping Strategy Indicator. *Journal of Personality and Social Psychology*, 59(5), 1066–1074.
- Anastopoulos, A. D., Guevremont, D. C., Shelton, T. L., & DuPaul, G. J. (1992). Parenting stress among families of children with attention deficit hyperactivity disorder. *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology*, 20(5), 503–520.
- Arnold, L. E., Abikoff, H. B., Cantwell, D. P., Conners, C. K., Elliott, G. R., Greenhill, L. L., ... Wells, K. C. (1997). NIMH collaborative multimodal treatment study of children with ADHD (MTA): Design, methodology, and protocol evolution. *Journal of Attention Disorders*, 2(3), 141–158.
- Association, A. P. (2000). Diagnostic and statistical manual of mental disorders. Washington, DC: American Psychiatric Association.
- Bailey, J., Barton, B., & Vignola, A. (1999). Coping with children with ADHD: Coping styles of mothers with children with ADHD or challenging behaviours. *Early Child Development and Care*, 148, 35–50.
- Baker, B. L., Blacher, J., & Olsson, M. B. (2005). Preschool children with and without developmental delay: Behaviour problems, parents' optimism and well-being. *Journal of Intellectual Disability Research*, 49(8), 575–590.
- Baker, D. B., & McCal, K. (1995). Parenting stress in parents of children with attention-deficit hyperactivity disorder and parents of children with learning disabilities. *Journal of Child and Family Studies*, 4(1), 57–68.
- Banks, T., Ninowski, J. E., Mash, E. J., & Semple, D. L. (2008). Parenting behavior and cognitions in a community sample of mothers with and without symptoms of attention-deficit/hyperactivity disorder. *Journal of Child and Family Studies*, 17(1), 28–43.

- Barkley, R. A., Guevremont, D. C., Anastopoulos, A. D., DuPaul, G. J., & Shelton, T. L. (1993). Driving-related risks and outcomes of attention deficit hyperactivity disorder in adolescents and young adults: a 3- to 5-year follow-up survey. *Pediatrics*, *92*(2), 212–218.
- Barkley, Russell A., Anastopoulos, A. D., Guevremont, D. C., & Fletcher, K. E. (1992). Adolescents with attention deficit hyperactivity disorder: Mother-adolescent interactions, family beliefs and conflicts, and maternal psychopathology. *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology*, *20*(3), 263–288.
- Barkley, Russell A., Fischer, M., Edelbrock, C., & Smallish, L. (1991). The adolescent outcome of hyperactive children diagnosed by research criteria: III. Mother-child interactions, family conflicts and maternal psychopathology. *Journal of Child Psychology and Psychiatry*, *32*(2), 233–255.
- Baron, R. M., & Kenny, D. A. (1986). The moderator/mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182.
- Barrera, M. (1986). Distinctions between social support concepts, measures, and models. *American Journal of Community Psychology*, *14*(4), 413–445.
- Befera, M. S., & Barkley, R. A. (1985). Hyperactive and normal girls and boys: Mother-child interaction, parent psychiatric status and child psychopathology. *Journal of Child Psychology and Psychiatry*, *26*(3), 439–452.
- Biederman, J., & Faraone, S. V. (2002). Current concepts on the neurobiology of attention-deficit/hyperactivity disorder. *Journal of Attention Disorders*, *6*(Suppl), S-7–S-16.
- Biederman, J., Petty, C. R., Evans, M., Small, J., & Faraone, S. V. (n.d.). How persistent is ADHD? A controlled 10-year follow-up study of boys with ADHD. *Psychiatry Research*, *177*(3), 299–304.
- Billings, A. G., & Moos, R. H. (1984). Coping, stress, and social resources among adults with unipolar depression. *Journal of Personality and Social Psychology*, *46*(4), 877–891.
- Breen, M. J., & Barkley, R. A. (1988). Child psychopathology and parenting stress in girls and boys having attention deficit disorder with hyperactivity. *Journal of Pediatric Psychology*, *13*(2), 265–280.

- Burke, J. D., Loeber, R., & Lahey, B. B. (2001). Which aspects of ADHD are associated with tobacco use in early adolescence? *Journal Of Child Psychology And Psychiatry, And Allied Disciplines*, 42(4), 493–502.
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989a). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56(2), 267–283.
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989b). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56(2), 267–283.
- Chen, M., Seipp, C. M., & Johnston, C. (2008). Mothers' and fathers' attributions and beliefs in families of girls and boys with attention-deficit/hyperactivity disorder. *Child Psychiatry and Human Development*, 39(1), 85–99.
- Chi, T. C., & Hinshaw, S. P. (2002). Mother-child relationships of children with ADHD: The role of maternal depressive symptoms and depression-related distortions. *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology*, 30(4), 387–400.
- Chronis, A. M., Gamble, S. A., Roberts, J. E., & Pelham, W. E. (2006). Cognitive-Behavioral Depression Treatment for Mothers of Children With Attention-Deficit/Hyperactivity Disorder. *Behavior Therapy*, 37(2), 143–158.
- Chronis, A. M., Lahey, B. B., Pelham, W. E., Kipp, H. L., Baumann, B. L., & Lee, S. S. (2003). Psychopathology and Substance Abuse in Parents of Young Children With Attention-Deficit/Hyperactivity Disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 42(12), 1424–1432.
- Chronis, A. M., Lahey, B. B., Pelham, W. E., Williams, S. H., Baumann, B. L., Kipp, H., ... Rathouz, P. J. (2007). Maternal depression and early positive parenting predict future conduct problems in young children with attention-deficit/hyperactivity disorder. *Developmental Psychology*, 43(1), 70–82.
- 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: An official publication of the International Society for Research in Child and Adolescent Psychopathology*, 36(8), 1237–1250.
- Cohen, J. (1992). Quantitative methods in psychology: A power primer. *Psychological Bulletin*, 112(1), 155–159.

- Compas, B. E., Howell, D. C., Phares, V., Williams, R. A., & Ledoux, N. (1989). Parent and child stress and symptoms: An integrative analysis. *Developmental Psychology, 25*(4), 550–559.
- Creasey, G., & Reese, M. (1996). Mothers' and fathers' perceptions of parenting hassles: Associations with psychological symptoms, nonparenting hassles, and child behavior problems. *Journal of Applied Developmental Psychology, 17*(3), 393–406.
- Cunningham, C. E., Benness, B. B., & Siegel, L. S. (1988). Family functioning, time allocation, and parental depression in the families of normal and ADDH children. *Journal of Clinical Child Psychology, 17*(2), 169–177.
- Daley, D. (2006). Attention deficit hyperactivity disorder: A review of the essential facts. *Child: Care, Health and Development, 32*(2), 193–204.
- Daviss, W. B. (2008). A review of co-morbid depression in pediatric ADHD: Etiologies, phenomenology, and treatment. *Journal of Child and Adolescent Psychopharmacology, 18*(6), 565–571.
- Derogatis, L. R., & Cleary, P. A. (1977). Confirmation of the dimensional structure of the SCL-90: A study in construct validation. *Journal of Clinical Psychology, 33*(4), 981–989.
- Derogatis, L. R., Lipman, R. S., Rickels, K., Uhlenhuth, E. H., & Covi, L. (1974). The Hopkins Symptoms Checklist (HSCL): A self-report symptom inventory. *Behavioral Science, 19*(1), 1–15.
- DuPaul, G. J., Anastopoulos, A. D., Power, T. J., Reid, R., Ikeda, M. J., & McGoey, K. E. (1998). Parent ratings of attention-deficit/hyperactivity disorder symptoms: Factor structure and normative data. *Journal of Psychopathology and Behavioral Assessment, 20*(1), 83–102.
- Edwards, J. H. (2002). Evidenced-based treatment for child ADHD: “Real-world” practice implications. *Journal of Mental Health Counseling, 24*(2), 126–139.
- 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: An official publication of the International Society for Research in Child and Adolescent Psychopathology, 28*(6), 585–594.
- Faraone, S. V., & Biederman, J. (2000). Nature, nurture, and attention deficit hyperactivity disorder. *Developmental Review, 20*(4), 568–581.

- Faraone, S. V., Biederman, J., & Mick, E. (2006). The age-dependent decline of attention deficit hyperactivity disorder: a meta-analysis of follow-up studies. *Psychological Medicine*, 36(2), 159–165.
- Fischer, M. (1990). Parenting stress and the child with attention deficit hyperactivity disorder. *Journal of Clinical Child Psychology*, 19(4), 337–346.
- Flory, K., Molina, B. S. G., Pelham, W. E., Gnagy, E., & Smith, B. (2006). Childhood ADHD predicts risky sexual behavior in young adulthood. *Journal Of Clinical Child And Adolescent Psychology: The Official Journal For The Society Of Clinical Child And Adolescent Psychology, American Psychological Association, Division 53*, 35(4), 571–577.
- Foster, C. E., Webster, M. C., Weissman, M. M., Pilowsky, D. J., Wickramaratne, P. J., Rush, A. J., King, C. A. (2008). Course and severity of maternal depression: Associations with family functioning and child adjustment. *Journal of Youth and Adolescence*, 37(8), 906–916.
- Foster, C. J. E., Garber, J., & Durlak, J. A. (2008). Current and past maternal depression, maternal interaction behaviors, and children's externalizing and internalizing symptoms. *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology*, 36(4), 527–537.
- Fotiadou, M., Barlow, J. H., Powell, L. A., & Langton, H. (2008). Optimism and psychological well-being among parents of children with cancer: An exploratory study. *Psycho-Oncology*, 17(4), 401–409.
- Gerdes, A. C., & Hoza, B. (2006). Maternal Attributions, Affect, and Parenting in Attention Deficit Hyperactivity Disorder and Comparison Families. *Journal of Clinical Child and Adolescent Psychology*, 35(3), 346–355.
- Gerdes, A. C., Hoza, B., Arnold, L. E., Pelham, W. E., Swanson, J. M., Wigal, T., & Jensen, P. S. (2007). Maternal depressive symptomatology and parenting behavior: Exploration of possible mediators. *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology*, 35(5), 705–714.
- Grizenko, N., Paci, M., & Joober, R. (2010). Is the inattentive subtype of ADHD different from the combined/hyperactive subtype? *Journal of Attention Disorders*, 13(6), 649–657.
- Hankin, C. S. (2001). ADHD and its impact on the family. *Drug Benefit Trends*, 13, 15–16.

- 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(6), 703–711.
- Harvey, E., Danforth, J. S., McKee, T. E., Ulaszek, W. R., & Friedman, J. L. (2003). Parenting of children with attention-deficit/hyperactivity disorder (ADHD): the role of parental ADHD symptomatology. *Journal Of Attention Disorders*, 7(1), 31–42.
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76(4), 408–420.
- Hayes, A. F., & Preacher, K. J. (2010). Quantifying and Testing Indirect Effects in Simple Mediation Models When the Constituent Paths Are Nonlinear. *Multivariate Behavioral Research*, 45(4), 627–660.
- Hazell, P. L. (2009). 8-year follow-up of the MTA sample. *Journal of the American Academy of Child & Adolescent Psychiatry*, 48(5), 461–462.
- Hinshaw, S. P. (2007). Moderators and mediators of treatment outcome for youth with ADHD: Understanding for whom and how interventions work. *Journal of Pediatric Psychology*, 32(6), 664–675.
- Hinshaw, S. P., Owens, E. B., Wells, K. C., Kraemer, H. C., Abikoff, H. B., Arnold, L. E., ... Wigal, T. (2000). Family processes and treatment outcome in the MTA: Negative/ineffective parenting practices in relation to multimodal treatment. *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology*, 28(6), 555–568.
- Hoza, B., Owens, J. S., Pelham, W. E., Swanson, J. M., Conners, C. K., Hinshaw, S. P., ... Kraemer, H. C. (2000). Parent cognitions as predictors of child treatment response in attention-deficit/hyperactivity disorder. *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology*, 28(6), 569–583.
- Hurtig, T., Ebeling, H., Taanila, A., Miettunen, J., Smalley, S., McGough, J., Moilanen, I. (2007). ADHD and comorbid disorders in relation to family environment and symptom severity. *European Child & Adolescent Psychiatry*, 16(6), 362–369.
- Jerome, L. (1997). Families of patients with attention-deficit hyperactivity disorder. *The Canadian Journal of Psychiatry / La Revue canadienne de psychiatrie*, 42(2), 211–211.

- Johnston, C., & Freeman, W. (1997). Attributions for child behavior in parents of children without behavior disorders and children with attention deficit-hyperactivity disorder. *Journal of Consulting and Clinical Psychology, 65*(4), 636–645.
- Johnston, C., Seipp, C., Hommersen, P., Hoza, B., & Fine, S. (2005). Treatment choices and experiences in attention deficit and hyperactivity disorder: Relations to parents' beliefs and attributions. *Child: Care, Health and Development, 31*(6), 669–677.
- Johnston, Charlotte. (1996). Parent characteristics and parent/child interactions in families of nonproblem children and ADHD children with higher and lower levels of oppositional-defiant behavior. *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology, 24*(1), 85–104.
- Johnston, Charlotte, Hommersen, P., & Seipp, C. M. (2009). Maternal attributions and child oppositional behavior: A longitudinal study of boys with and without attention-deficit/hyperactivity disorder. *Journal of Consulting and Clinical Psychology, 77*(1), 189–195.
- Johnston, Charlotte, & Mash, E. J. (2001). Families of children with Attention-Deficit/Hyperactivity Disorder: Review and recommendations for future research. *Clinical Child and Family Psychology Review, 4*(3), 183–207.
- Johnston, Charlotte, & Ohan, J. L. (2005). The Importance of Parental Attributions in Families of Children with Attention-Deficit/Hyperactivity and Disruptive Behavior Disorders. *Clinical Child and Family Psychology Review, 8*(3), 167–182.
- Kashdan, T. B., Jacob, R. G., Pelham, W. E., Lang, A. R., Hoza, B., Blumenthal, J. D., & Gnagy, E. M. (2004). Depression and Anxiety in Parents of Children With ADHD and Varying Levels of Oppositional Defiant Behaviors: Modeling Relationships With Family Functioning. *Journal of Clinical Child and Adolescent Psychology, 33*(1), 169–181.
- Kohut, C. S., & Andrews, J. (2004). The efficacy of parent training programs for ADHD children: A fifteen-year review. *Developmental Disabilities Bulletin, 32*(2), 155–172.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.

- Lesesne, C. A., Visser, S. N., & White, C. P. (2003). Attention-deficit/hyperactivity disorder in school-aged children: association with maternal mental health and use of health care resources. *Pediatrics*, *111*(5 Part 2), 1232–1237.
- Lifford, K. J., Harold, G. T., & Thapar, A. (2008). Parent-child relationships and ADHD symptoms: A longitudinal analysis. *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology*, *36*(2), 285–296.
- Luby, J. L., Belden, A. C., & Spitznagel, E. (2006). Risk factors for preschool depression: The mediating role of early stressful life events. *Journal of Child Psychology and Psychiatry*, *47*(12), 1292–1298.
- Mannuzza, S., Klein, R. G., Bessler, A., Malloy, P., & LaPadula, M. (1998). Adult psychiatric status of hyperactive boys grown up. *The American Journal Of Psychiatry*, *155*(4), 493–498.
- Mash, E. J., & Johnston, C. (1983). Parental perceptions of child behavior problems, parenting self-esteem, and mothers' reported stress in younger and older hyperactive and normal children. *Journal of Consulting and Clinical Psychology*, *51*(1), 86–99.
- Mash, E. J., & Johnston, C. (1990). Determinants of parenting stress: Illustrations from families of hyperactive children and families of physically abused children. *Journal of Clinical Child Psychology*, *19*(4), 313–328.
- McCormick, L. H. (1995). Depression in mothers of children with attention deficit hyperactivity disorder. *Family Medicine*, *27*(3), 176–179.
- McCubbin, H., Patterson, J., & Wilson, L. (1981). *Family Inventory of Life Events and Changes (FILE), Form A*. St. Paul, MN: Family Social Science.
- McCubbin, M. (1988). Family Stress, Resources, and Family Types: Chronic Illness in Children. *Family Relations*, *37*(2), 203–210.
- McKee, T. E., Harvey, E., Danforth, J. S., Ulaszek, W. R., & Friedman, J. L. (2004). The Relation Between Parental Coping Styles and Parent-Child Interactions Before and After Treatment for Children With ADHD and Oppositional Behavior. *Journal of Clinical Child and Adolescent Psychology*, *33*(1), 158–168.
- Modesto-Lowe, V., Danforth, J. S., & Brooks, D. (2008). ADHD: Does parenting style matter? *Clinical Pediatrics*, *47*(9), 865–872.

- Monat, A., & Lazarus, R. S. (1991). *Stress and coping: An anthology (3rd ed.)*. New York, NY US: Columbia University Press. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=1991-97822-000&site=ehost-live>
- Neff, P. E. (2008). *Raising an ADHD child: An examination of maternal well-being in Canada and the United States*. ProQuest Information & Learning, Dissertation Abstracts International Section A: Humanities and Social Sciences, US. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2008-99210-358&site=ehost-live>
- Nigg, J. T., & Hinshaw, S. P. (1998). Parent personality traits and psychopathology associated with antisocial behaviors in childhood attention-deficit hyperactivity disorder. *Journal of Child Psychology and Psychiatry*, *39*(2), 145–159.
- Patterson, J. M., & McCubbin, H. I. (1983). The impact of family life events and changes on the health of a chronically ill child. *Family Relations: An Interdisciplinary Journal of Applied Family Studies*, *32*(2), 255–264.
- Pelham, W. E., Lang, A. R., Atkeson, B., Murphy, D. A., Gnagy, E. M., Greiner, A. R., ... Greenslade, K. E. (1997). Effects of deviant child behavior on parental distress and alcohol consumption in laboratory interactions. *Journal Of Abnormal Child Psychology*, *25*(5), 413–424.
- Pelham, William 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*(4), 292–298.
- Pelham, William E., Wheeler, T., & Chronis, A. (1998). Empirically supported psychosocial treatments for attention deficit hyperactivity disorder. *Journal of Clinical Child Psychology*, *27*(2), 190–205.
- Podolski, C.-L., & Nigg, J. T. (2001). Parent stress and coping in relation to child ADHD severity and associated child disruptive behavior problems. *Journal of Clinical Child Psychology*, *30*(4), 503–513.
- Poissant, H., & Montgomery, C. (2003). Attention Deficit and Hyperactivity Disorder (ADHD) and Depression in Children and Adolescents: Implications for Practitioners and Educators. *Journal of Cognitive Education and Psychology*, *3*(3), 323–341.

- Power, T. J., Doherty, B. J., Panichelli-Mindel, S. M., Karustis, J. L., Eiraldi, R. B., Anastopoulos, A. D., & DuPaul, G. J. (1998). The predictive validity of parent and teacher reports of ADHD symptoms. *Journal of Psychopathology and Behavioral Assessment, 20*(1), 57–81.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments & Computers, 36*(4), 717–731.
- Psychogiou, L., Daley, D. M., Thompson, M. J., & Sonuga-Barke, E. J. S. (2008). Do maternal attention-deficit/hyperactivity disorder symptoms exacerbate or ameliorate the negative effect of child attention-deficit/hyperactivity disorder symptoms on parenting? *Development and Psychopathology, 20*(1), 121–137.
- Ray, G. T., Croen, L. A., & Habel, L. A. (2009). Mothers of children diagnosed with attention-deficit/hyperactivity disorder: Health conditions and medical care utilization in periods before and after birth of the child. *Medical Care, 47*(1), 105–114.
- Robin, A. L. (1999). Attention-Deficit/Hyperactivity Disorder in Adolescents: Common Pediatric Concerns. *Pediatric Clinics of North America, 46*(5), 1027–1038.
- Root, R. W., & Resnick, R. J. (2003). An update on the diagnosis and treatment of attention-deficit/hyperactivity disorder in children. *Professional Psychology: Research and Practice, 34*(1), 34–41.
- Rucker, D. D., Preacher, K. J., Tormala, Z. L., & Petty, R. E. (2011). Mediation analysis in social psychology: Current practices and new recommendations. *Social and Personality Psychology Compass, 5*(6), 359–371.
- Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology, 4*(3), 219–247.
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology, 67*(6), 1063–1078.
- Scheier, M. F., Weintraub, J. K., & Carver, C. S. (1986). Coping with stress: Divergent strategies of optimists and pessimists. *Journal of Personality and Social Psychology, 51*(6), 1257–1264.

- Segenreich, D., Fortes, D., Coutinho, G., Pastura, G., & Mattos, P. (2009). Anxiety and depression in parents of a Brazilian non-clinical sample of attention-deficit/hyperactivity disorder (ADHD) students. *Brazilian Journal Of Medical And Biological Research*, *42*(5), 465–469.
- Segerstrom, S. C. (2001). Optimism and attentional bias for negative and positive stimuli. *Personality and Social Psychology Bulletin*, *27*(10), 1334–1343.
- Sloper, P., & Turner, S. (1993). Risk and resistance factors in the adaptation of parents of children with severe physical disability. *Journal of Child Psychology and Psychiatry*, *34*(2), 167–188.
- Sprich, S., Biederman, J., Crawford, M. H., Mundy, E., & Faraone, S. V. (2000). Adoptive and biological families of children and adolescents with ADHD. *Journal of the American Academy of Child & Adolescent Psychiatry*, *39*(11), 1432–1437.
- Swanson, J., Arnold, L. E., Kraemer, H., Hechtman, L., Molina, B., Hinshaw, S., Wigal, T. (2008). Evidence, interpretation, and qualification from multiple reports of long-term outcomes in the Multimodal Treatment Study of Children with ADHD (MTA): Part II: Supporting details. *Journal of Attention Disorders*, *12*(1), 15–43.
- Tenzer, S. A., Murray, D. W., Vaughan, C. A., & Sacco, W. P. (2006). Maternal depressive symptoms, relationship satisfaction, and verbal behavior: A social-cognitive analysis. *Journal of Social and Personal Relationships*, *23*(1), 131–149.
- Thomas, V. (1995). The clinical report: Integrating family assessment instruments into family counseling practice. *The Family Journal*, *3*(4), 284–297.
- Timko, C., Stovel, K. W., & Moos, R. H. (1992). Functioning among mothers and fathers of children with juvenile rheumatic disease: A longitudinal study. *Journal of Pediatric Psychology*, *17*(6), 705–724.
- Turgay, A., & Ansari, R. (2006). Major depression with ADHD in children and adolescents. *Psychiatry*, *3*(4), 21–31.
- Van den Hoofdakker, B. J., Nauta, M. H., Van der Veen-Mulders, L., Sytema, S., Emmelkamp, P. M. G., Minderaa, R. B., & Hoekstra, P. J. (2010). Behavioral parent training as an adjunct to routine care in children with attention-deficit/hyperactivity disorder: Moderators of treatment response. *Journal of Pediatric Psychology*, *35*(3), 317–329.
- Vaux, A. (1986). The social support appraisals (SS-A) scale: Studies of reliability and validity. *American Journal of Community Psychology*, *14*(2), 195–219.

- Vitanza, S. A., & Guarnaccia, C. A. (1999). A model of psychological distress for mothers of children with attention-deficit hyperactivity disorder. *Journal of Child and Family Studies*, 8(1), 27–45.
- Wells, K. C., Epstein, J. N., Hinshaw, S. P., Conners, C. K., Klaric, J., Abikoff, H. B., ... Wigal, T. (2000). Parenting and family stress treatment outcomes in attention deficit hyperactivity disorder (ADHD): An empirical analysis in the MTA study. *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology*, 28(6), 543–553.
- West, J., Houghton, S., Douglas, G., Wall, M., & Whiting, K. (1999). Levels of self-reported depression among mothers of children with Attention-Deficit/Hyperactivity Disorder. *Journal of Attention Disorders*, 3(3), 135–140.
- Wright, K. B. (2005). Researching Internet-Based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages, and Web Survey Services. *Journal of Computer-Mediated Communication*, 10(3), No Pagination Specified.
- Wymbs, B. T., Pelham, W. E., Molina, B. S. G., Gnagy, E. M., Wilson, T. K., & Greenhouse, J. B. (2008). Rate and predictors of divorce among parents of youths with ADHD. *Journal Of Consulting And Clinical Psychology*, 76(5), 735–744.
- Young, S., & Amarasinghe, J. M. (2010). Practitioner review: Non-pharmacological treatments for ADHD: A lifespan approach. *Journal of Child Psychology and Psychiatry*, 51(2), 116–133.

CURRICULUM VITAE

Lucy R. Leibowitz (née Buchholz) graduated cum laude from Tufts University in 2006. She received her Master of Arts in Clinical Psychology from George Mason University in 2009 and will complete her clinical internship at Kennedy Krieger Institute/Johns Hopkins University in 2013. Her primary clinical interests include intervention and psychological assessment with children with attention and behavioral problems, including those with comorbid medical diagnoses. Her research interests include exploring the interactive relationships between family members in the development, maintenance, and treatment of psychopathology, specifically in children with attention and behavioral problems.