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**MATERNAL ATTRIBUTIONS ABOUT CHILD DISRUPTIVE BEHAVIORS
IN RELATION TO CHILD BEHAVIORS AND MATERNAL ADJUSTMENT**

By

Cheryl-Lynn Podolski

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ABSTRACT

MATERNAL ATTRIBUTIONS ABOUT CHILD DISRUPTIVE BEHAVIORS IN RELATION TO CHILD BEHAVIORS AND MATERNAL ADJUSTMENT

By

Cheryl-Lynn Podolski

The pathways by which maternal attributions about child ADHD and other disruptive behaviors relate to maternal adjustment are not well understood, yet such understandings might contribute to effective interventions. Early studies indicated that maternal attributions about child problem behaviors influence both parental affective and behavioral responses and subsequent behavioral chains. The current study applied this line of research to child attention deficit hyperactivity disorder (ADHD), by investigating maternal attributions about their children's inattentive, overactive, and disobedient behaviors in relation to maternal role adjustment.

Participants were 125 mothers for whom interviews were obtained about child behaviors (DISC-IV), maternal attributions (Johnston's Written Analogue Questionnaire and Recalled Incident Interview), and maternal adjustment (Parenting Satisfaction Scale and Parenting Stress Index). Child ADHD status was assessed via parent and teacher ratings and the structured diagnostic interview. 51 children had one of the ADHD subtypes, 34 were ADHD NOS/Subthreshold, and 41 were controls.

Similar to prior findings, mothers of children with ADHD characterized their children's misbehavior as more stable, global, and less controllable compared to mothers of children without ADHD ($F[1,81]=12.6, p<.001$). This pattern is consistent with the realities of ADHD. It is similar to the pattern of attributions associated with learned

helplessness but somewhat different from a pattern associated with distress in parents of non-disordered children. In the current study, maternal attributions of stability ($r=.34$, $p<.001$) and globality ($r=.43$, $p<.001$) were related to maternal role dissatisfaction and role stress. Maternal attributions about child *disobedient behaviors* were related to maternal adjustment even when ratings of child oppositional behaviors were controlled (partial $r=.25$, $p<.01$). In contrast, the relation between attributions about child *inattentive/overactive behaviors* and maternal adjustment was fully mediated by ratings of child behaviors. Relatedly, child ADHD *diagnosis* moderated the relation between maternal attributions about inattentive/overactive behaviors and maternal adjustment but not the relation between maternal attributions about oppositional behaviors and maternal adjustment.

In a secondary study, child attributions about their own behaviors were also examined using a version of the Written Analogue Questionnaire adapted for use with children. Children with ADHD attributed their disruptive behaviors to more uncontrollable and internal causes compared to children without ADHD.

Findings are discussed in terms of implications of attribution theory for parental adjustment to child ADHD and externalizing behavior, the possibility of unique processes operating in families of children with ADHD versus non-ADHD families, the importance of distinguishing symptoms of ADHD from oppositional behaviors, and potential implications and suggestions for future intervention studies to evaluate the import of the findings. Future work will examine paternal attributions. Overall, findings suggest that parental and child attributions are an important element in family processes related to development of childhood ADHD.

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INTRODUCTION

Surprisingly little is known about contextual factors related to behaviors associated with Attention Deficit Hyperactivity Disorder (ADHD). Despite the relative lack of attention to contextual factors, recent studies have repeatedly found that parents of children with ADHD experience higher levels of stress than their contemporaries (Anastopoulos, Guevremont, Shelton, & DuPaul, 1992; Johnston & Mash, 2001; Podolski & Nigg, 2001). What factors contribute to this stress and what might be done to ameliorate it are just beginning to be explored. Notably, parent adjustment to their child's ADHD is important to study in order to help parents help children. The current study focused on one factor that may be important for understanding mechanisms that contribute to maternal stress. Through understanding such mechanisms, it is possible that better interventions for parents and their children may be designed.

A number of separate literatures indicate that cognitions are important in determining an individual's responses to others' behaviors. These literatures include: coping and adjustment, social cognition, and parenting and child development. These literatures will each be briefly reviewed. Then following from and expanding upon these literatures, parent attributions about child behaviors are proposed as an important factor likely to influence parent and child adjustment.

CHAPTER 1

LITERATURE REVIEW FOR STUDY 1: MATERNAL ATTRIBUTIONS

Overview

In examining parent attributions as an important contextual factor relevant to parental adjustment to their child's ADHD, a basic argument is made. First, child ADHD behaviors are proposed as a stressor for parents. A body of literature supports this assertion. The bi-directional pathways by which child behavior and parent stress exacerbate each other is acknowledge and in fact is a support for the need for studying parental adjustment. With this acknowledged, child ADHD behaviors are outlined as a stressor for parents.

A second line of argument taken herein is that studying parent attributions and adjustment is important not only in terms of helping parents but also in terms of helping children. Possible implications for child adjustment are outlined in relation to parent attributions and adjustment to clarify the importance of the study in terms of helping children as well as parents.

Given the importance and need to study parent attributions, findings from general coping literature, social cognitive literature, and recent studies of parent attributions are reviewed. In brief, the learned helplessness model of attributions is reviewed, suggesting that a pessimistic attributional style for negative events is associated with poor adjustment. The domains of globality, stability, internality, and uncontrollability for negative events have been associated with depression (Peterson & Bunce, 1997; Sweeney, Anderson, & Bailey, 1986). The literature on social cognition, affect, and

behavior illuminates attributions that might be made about child disruptive behaviors and how these behaviors might in turn be linked to parental role adjustment. This literature indicates that attributions about others effect affective or behavioral responses to those others (Weiner, 1980). Then the literature on parent attributions generally is reviewed. This literature suggests that the ways parents perceive their children's behavior likely contributes or mitigates the stress they experience (Dix & Grusec, 1985; Podolski & Nigg, 2001).

The few initial studies that have been conducted with mothers of children with ADHD are then reviewed for comparison to the findings from the general literature. Recent studies have found that parents of children with ADHD believe inattentive-overactive and oppositional defiant behaviors are uncontrollable by the child and stable across time and situation (Johnston & Freeman, 1997). It is noted that these attributions coincide with what we might expect given that by diagnostic criteria children with ADHD exhibit hyperactivity and inattentive behaviors in multiple settings and to levels of severity such that the behaviors are not controllable by normal means. Thus, recent findings coincide with the diagnostic criteria.

Notably, despite these findings, the ways in which these cognitions affect parental affective and behavioral responses to their children are yet to be well understood. To date, only one known study investigated attributions in relation to parent adjustment to their child's ADHD (Hoza et al., 2000). Thus, the current study aimed to replicate earlier findings regarding the attribution profile parents of children with ADHD make about their children's behaviors and secondly to explore whether and in what ways these attributions in turn relate to parental role adjustment.

Child Disruptive Behaviors

Child disruptive disorders serve as a documented source of stress for parents (Anastopolous et al., 1992; Barkely, 1998; Podolski & Nigg, 2001). Disruptive behavior disorders include Attention Deficit Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD). Although ODD and CD has long been understood as related to parent and family stress, ADHD has only recently been understood as a source of stress for parents. Before reviewing that research, a brief overview of ADHD is provided.

Attention-Deficit Hyperactivity Disorder (ADHD) is currently one of the most prevalent childhood psychiatric disorders. Estimates suggest that 3 to 5% of school-aged children exhibit severe enough levels of inattention and/or hyperactivity across multiple settings such that the meet diagnostic criteria for ADHD (American Psychiatric Association, 1994; Szatmari, Offord, & Boyle, 1989a). ADHD is characterized by levels of activity, impulsivity, and/or inattention that are extreme for developmental level and severe enough to interfere with the child's adjustment across settings. By diagnostic criteria, the behavior of children with ADHD is such that the child's behavior is not readily controllable through normal parenting behaviors.

The child's disruptive behaviors are also severe enough to interfere with relationships and academic functioning. For example, children with ADHD are often unable to pay attention to detail, organize, remember, or keep track of things (American Psychiatric Association, 1994). These problems have real world implications in terms of impaired academics, social and emotional problems, and stressful parent-child

interactions. Unsurprisingly, child ADHD behaviors are associated with parental role stress (Frick, 1994; Johnston & Mash, 2001; Podolski & Nigg, 2001).

Aggressive and oppositional behaviors are the most common and serious co-existing problems for children who exhibit inattentive/overactive behaviors. Co-occurring aggression reaches diagnostic levels in 30-50% of ADHD cases (Anderson, Williams, McGee & Silva, 1987). Some studies suggest that 54-67% of children and adolescents with ADHD meet full criteria for Oppositional Defiant Disorder (ODD) or Conduct Disorder (CD) (Barkley & Biederman, 1997; Faraone & Biederman, 1997). Understandably, co-occurring aggressive behavior provides another source of stress for parents of children with ADHD. It is a serious complication with implications for children with ADHD and for their parents – with both disorders contributing uniquely to parent stress.

Parental Adjustment to Children's ADHD

Studies consistently have found that mothers of children with ADHD experience higher levels of distress compared to parents of non-disordered children. This distress is not limited to global psychological distress but refers to role specific parenting stress as well. That is, mothers of children with ADHD reported greater global psychological distress (Befera & Barkley, 1984), greater role specific stress (Mash & Johnston, 1983a), and lowered sense of parenting competence (Mash & Johnston, 1983a) compared to mothers of children without behavioral disorders. Severity of child ADHD symptoms has been related to maternal parenting stress (Anastopolous et al., 1992; Podolski & Nigg, 2001).

This role stress appears to be related to ADHD symptomatology as well as to co-morbid aggression. Although early studies did not control for the effect of comorbid aggression on maternal stress, recent studies indicate that children's ADHD behaviors contribute significantly to parent role stress independent of co-morbid aggression (Anastopoulos et al., 1992; Johnston, 1996b; Podolski & Nigg, 2001). Anastopoulos et al. (1992) found that child CBCL Aggression (Achenbach, 1991) accounted for 37% of the variance in parental stress and that CBCL Attention Problems accounted for a further 4% of variance ($p < .001$). Podolski and Nigg (2001) found that child inattention and oppositional-conduct problems but not hyperactivity were uniquely related to role stress in mothers but not fathers. These studies demonstrate that parents may experience significant role stress specifically related to their child's ADHD behaviors, even though much of their stress is in response to associated aggressive behaviors. Thus, child ADHD as well as child aggression serve as significant and important stressors for parents although the co-morbid aggression proves to account for a large but not exclusive portion of the variance predicting parent role stress.

Context and ADHD

ADHD is currently viewed as a largely biogenetic behavioral disorder (Biederman et al., 1992; Tannock, 1998); however, family and contextual mechanisms are important to the development, maintenance, and exacerbation of the disorder (Biederman et al., 1995; see review by Johnston & Mash, 2001) and in the effective treatment of ADHD. For example, family contextual and parental factors likely impact

treatment decision-making and treatment adherence (Gage & Wilson, 2000; Christophersen & Mortweet, 2001).

Notably, contextual factors appear related to the maintenance and exacerbation of ADHD symptoms in children and to the development of comorbid aggressive behaviors (Hinshaw et al., 1997). The negative interactions that ensue between ADHD children and their parents, teachers, and peers create stress and conflict between the child and others in their environment and likely leads to frustration and increased stress. Increased stress in parents is associated with ineffective parenting practices (Patterson, 1996). Although medication is the primary treatment for ADHD, behavioral programs implemented by parents and teachers are also important aspects of treatment. Increased parent stress and related ineffective parenting strategies are precisely opposite of what is needed to help children with ADHD. Notably, treatments which incorporate family contextual factors appear to provide needed support to families whose children have ADHD (Barkley, 1990), decreasing disruptive child behaviors, addressing comorbid oppositional and disobedient behaviors, and parent stress. Cognitive behavioral interventions have also been successful in ameliorating child behavioral dysfunction and are often used in conjunction with medication (and without medication in some situations) (Pisterman, McGrath, Firestone, & Goodman, 1988; Pollard, Ward, & Barkley, 1983). The cognitive behavioral and psychosocial interventions ameliorate child behaviors (Pisterman, McGrath, Firestone, & Goodman, 1988; Pollard, Ward, & Barkley, 1983) and also result in higher satisfaction and lowered parenting stress (compared to treatment of ADHD with medication alone) (MTA Cooperative Group, 1999; Barkley, 1990). While it is acknowledged, that ADHD symptoms are dramatically reduced by medication,

psychosocial and cognitive behavioral interventions clearly add to the treatment and appear to further facilitate reduction of child problematic behaviors and to significantly reduce parent stress. Additionally, cognitive behavioral interventions that incorporate contextual factors likely contribute to the prevention and/or treatment of comorbid oppositional/aggressive behaviors.

Notably, co-occurring aggressive behaviors in children with ADHD is a primary predictor of poor long-term adjustment in children (Hechtman & Weiss, 1983; Hechtman, Weiss, Perlman, & Amsel, 1984). How to prevent the co-occurrence of such problematic behaviors is thus essential for helping parents and their children. The reasons for the comorbidity of ADHD and aggression are multiple. Although biogenetic factors are likely key as the child's inability to suppress impulses and engage in planful behavior likely contributes to aggressive acting out, the lack of environmental supports and negative interactions with parents and other authorities is also a likely primary determinant of the development of co-morbid aggression. Currently, it is believed that although a common genetic vulnerability may contribute to the link between ADHD and aggression (Plomin et al., 1990), variability of comorbidity rates over time supports the role of environmental factors as a possible greater contributor (Frick, 1994; Lahey & Loeber, 1998). The known causal influence of family stress and conflict in the development of aggressive behavior in children means that children with ADHD are at risk for the development of co-morbid aggression not only due to child's impulsivity but also because the family is at-risk via higher stress and strain. Thus, understanding maternal adjustment to a child's ADHD is important not only to prevent possible exacerbation of ADHD symptomatology but also to prevent the development of

comorbid aggressive and oppositional/defiant behaviors. One possible causal link between ADHD and aggression may be contextual factors such as maternal stress and the attributions that affect adjustment.

Notably, maternal attributions have been linked to treatment decisions (Wright et al., 2000) and to treatment outcomes (Hoza, et al., 2000). For example, Hoza and colleagues (2000) recently found that in parents of children with ADHD, parental attributions about their children's behaviors were (a) related to parenting behaviors and (b) predictive of child treatment outcomes. Although not directly tested, the authors hypothesized that parental emotional adjustment may be a primary mediator between parent attributions, parenting behaviors, and child treatment outcomes. The current study examined parent attributions about their children's misbehaviors as a link to parental emotional adjustment (as measured by role adjustment).

Attributions and Coping

Given the importance of maternal adjustment in relation to child adjustment and the increasingly large literature on parent stress and ADHD, it is somewhat surprising that so few studies have examined possible mediating factors between the link between parent stress and their children's ADHD. As will be discussed in more detail later, the few studies that have examined factors that might ameliorate this stress (Anastopoulos et al., 1993; Podolski & Nigg, 2001) suggest that maternal attributions about children's behavior are likely to be one important variable related to parental adjustment. Indeed, literature in parents and normal adults suggests that attributions are determinant of adjustment to stressful circumstances generally.

A large body of literature links attributions to an individual's adjustment to stressors. In fact, how one appraises a situation or particular behaviors is directly linked to whether or not that situation/behavior is experienced as stressor (Lazarus & Folkman, 1984). Specifically, the interpretation one gives stressful events facilitates or impedes adjustment to a wide range of stressors (Lazarus & Folkman, 1984). For example, Lazarus and Folkman's (1984) transactional theory of coping to stressful events is based in part on the importance of appraisal in affecting emotional and behavioral responses to stressors. According to their theory, appraisal of "whether one has personal stake" in an event is directly related to one's emotional response to an event (p. 272). Most theories of coping assert that appraisal is significant in determining whether or not an event is experienced as stressful (Lazarus & Folkman, 1984; McCubbin & Patterson, 1983) and as an important mediator of behavioral response (Thompson et al., 1992).

Attributions, Adjustment, and Evaluations of Others

Appraisal Versus Attribution.

Appraisal refers to the evaluation of a situation or event for importance and personal relevance (Lazarus & Folkman, 1984) whereas attributions generally refer to beliefs or explanations about causes of the event (Miller, 1995). Just as appraisals of events have significance for adjustment, a person's explanations and perceptions of the causes of events and of his/her agency in relation to that event are related to adjustment (Dweck & Leggett, 1988; Peterson & Vaidya, 2001). A person's attributions about the causes of events have been viewed as determinant of his/her adjustment to those events. Just as appraisal about whether or not an event is considered stressful and relevant to an

individual's adjustment, a number of factors related to the cause of the event have also been seen as determinant of the individual's adjustment.

Two primary literatures on attributions are considered relevant to the current study. First is a review of the social cognitive literature that focuses on how causal attributions relate to evaluations of others. Second is a review of the ways in which causal attributions relate to ones' own adjustment.

Weiner's Attribution-Behavior Approach.

Initially, examination of parent attributions grew out of social cognitive studies of adults (see review by Dix & Grusec, 1985). Studies of adults' beliefs were examined in relation to affective reactions and behavioral responses to others (Weiner, 1980). A number of theories were developed which stated that attributions held by one person affected their response to the object of the attributions (see review by Fiske & Taylor, 1991). These theories were tested with research studies in order to find what types of attributions were made under what conditions and whether particular attributional profiles were related to differential responses by an observer and under what circumstances.

Weiner (1980) has been credited for explicating the three domains of causal attributions (see review by Miller, 1995; see review by Dweck & Leggett, 1988). These three domains are: locus (internal vs. external), stability (stable versus unstable), and controllability (controllable versus uncontrollable). Internality refers to explanations of causes that are due to characteristics of the self rather to some external or contextual cause. Stability refers to explanations or beliefs that the cause is consistent over time rather than operate in a temporary fashion. Globality refers to explanations or beliefs that

the cause is “going to undermine everything” rather than pertain to a limited, specific situation.

In addition to outlining these attributional domains, Weiner (Weiner, Graham, & Chandler, 1982; Weiner, Russell, & Lerman, 1978) is credited as one of the first psychologists to extend attribution theory from analyses of behavior to include the understanding of emotional reactions to events or people (see review by Miller, 1995). Weiner (1980) argued for a “cognition (attribution) – emotion – action temporal sequence” by which the causal attributions about an event preceded an emotional response to that event that in turn affected in a determining way the behavioral response. Weiner postulated that causal attributions are central to the affective adjustment as well as behavioral responses to a stressor.

Weiner (Weiner, Graham, & Chandler, 1982) found empirical support for the cognition – emotion – action temporal sequence first in studies of academic achievement (Weiner, Russell, & Lerman, 1978) and then in terms of helping behaviors (Weiner, 1980). Most relevant to the current study is Weiner’s work related to help giving.

Attributions and Response to Others

Although Weiner’s studies did not examine parenting attributions, he found causal attributions to be related to one person’s emotional reactions to another. Help-giving behaviors and positive, empathic emotional responses were related to attributions that the cause of need was due to disability or illness (which might assumed to be external) and was uncontrollable. The controllability dimension was seen to be of particular importance. Additionally, Weiner concluded that the relations found between

attributions and behaviors “exists because perceptions of control are strongly related to affective reactions” (1980, p. 196). This work suggests that understanding parent attributions about their children’s misbehavior may illuminate understanding of processes related to their emotional adjustment to those behaviors. Additionally, Weiner’s work allows the speculation that for parents external and uncontrollable attributions about child misbehaviors would be related to empathy and possibly a more positive, less stressed reaction to their children’s behavioral problems. In his study of helping behaviors, Weiner found that ratings of help-giving were lowest when the helper attributed the cause of the need to factors internal to the person in need and when the need for help was perceived as being within the person’s control.

In support of Weiner’s theory that attributions by care-providers are related to affective and behavioral responses to persons in need, Dagnan, Trower, and Smith (1998) found that attributions of controllability were related to negative emotion. In a study of care staff workers’ responses to adults with severe learning disabilities, Dagnan, Trower, and Smith (1998) found controllable (but uncontrolled) attributions by staff about patient behaviors were associated with negative emotional responses to that behavior.

Controllability and negative emotion were associated with less willingness to help.

Extrapolating to an ADHD population, these findings may imply that attributions of controllability made by parents about child misbehavior might be associated with more negative emotion toward the child and more parental role stress (or inversely that attributions of uncontrollability might be associated with less role stress).

Weiner also suggested that stability of behavior was an important attribution to be considered. Notably, more than the other attribution domains, stability is directly related

to schema theory. Theories of attributions essentially postulate that individuals hold schemas that affect resultant reactions and behaviors. Thus, Weiner's theory is a social information-processing model by which a person's beliefs affect his/her emotional and affective reactions. In terms of stability, the more stable a behavior is seen to be, the more that belief or schema is placed onto additional situations. Thus, if a behavior is seen as stable, then the set of attributions about that behavior may have more influence than if the behavior were not seen to cut across situations. In this way, stability attributions may be of particular importance in determining parental adjustment to their child's ADHD if those ADHD behaviors are seen as stable.

The "Learned Helplessness Model" of Attributions

Another line of research involving causal attributions is of potential relevance to the current study. The three causal attribution domains were also found to be linked to a phenomenon identified as "learned helplessness" (see review by Abramson, Seligman, & Teasdale, 1978 or Peterson, Maier, & Seligman, 1993).

As is widely taught in psychology textbooks, the concept of learned helplessness originated in studies by which dogs that were shocked eventually abandoned escape efforts following a series of conditions in which efforts to escape continuously met with no result. The dogs were thought to have learned the independence between their actions and what followed (response-outcome independence). After repeated exposures, the dogs failed to try to escape the shock even when the barriers that had previously prevented their escape were taken away.

The examination of people's attributions following uncontrollable events led to the extension of "learned helplessness" to people (Abramson, Seligman, & Teasdale, 1978). An analogy was drawn between the dogs "learned helpless" behaviors and behaviors exhibited by individuals who exhibited depression. Through a series of studies, it was discovered that stable, internal, and global attributions for uncontrollable, negative events were associated with "helpless" or quitting behaviors (Peterson & Barrett, 1987; Peterson, Maier, & Seligman, 1993) and depression (Brewin, 1985; Peterson, et al., 1982; Peterson, Maier, & Seligman, 1993). Of note for comparison to current study findings, Peterson has recently noted that stability and globality may account for most of relation between attributional style and depression (Peterson & Bunce, 1997; Peterson, Seligman, Yurko, Martin & Friedman, 1998).

Given that mothers of children with ADHD are faced with a disorder that by definition is "uncontrollable by normal means," stable, and global across situations, it is possible that mothers would experienced depressed symptomatology in the face of their child's ADHD. Although beyond the scope of the current study, "helpless" or giving up of particular parenting behaviors would also be expected. It is possible that ADHD behaviors would also be attributed as internal to the child. Notably, while borrowing from the learned helplessness literature in attempting to understand maternal stress, it is important to note that within the learned helplessness literature, *attributions about the individual's own behavior* were assessed. The current application is to ascertain whether attributions about the child's behavior (e.g., is the child's behavior uncontrollable for the child not for the parent). This is noted as an important difference between the learned helplessness literature and the current study measures.

While the attribution approach is seen as most useful for an initial examination of the role of mothers' beliefs and adjustment in relation to their children's behaviors, a third line of research which extends beyond attributions is worth mention. Dweck (Dweck & Leggett, 1988) considered underlying theories that precede judgments and reactions based on *attributions about others behaviors*. That is, Dweck has argued that people have implicit theories from which their attributions stem. While beyond the scope of the current study, it is worthwhile to make brief mention of this theory for future consideration and for the understanding of further possible implications of the current study findings. Additionally, Dweck's research underscores which attribution domains may be most relevant for study.

Dweck's Theory-Attribution-Behavior Approach.

Dweck's theory posits that people hold implicit theories about themselves and others. Their goals and evaluations both of themselves and others are based on these implicit theories. Thus, Dweck's theory attempts to understand theories that precede attribution evaluation. According to Dweck, individuals make attributions and set goals based on implicit theories. Their responses (emotional and behavioral) to those attributions and goals are thus first guided by the individual's implicit theories. That is, like Weiner, Dweck proposes an attribution-motivation-behavior sequence. Dweck's sequence is stated as theory → goal orientation/attribution evaluation → behavior pattern (Dweck & Leggett, 1988).

Dweck's work has contrasted two primary theories about traits – traits as a fixed entity versus traits as incremental and malleable (Dweck & Leggett, 1988). An entity

theory is “the belief that traits are fixed” versus incremental trait beliefs that “traits are malleable” (Heyman & Dweck, 1998, p.391). A fixed/entity theory of behavior (and motivation) indicates stability of the behavior while a malleable theory of behavior indicates lack of stability of behavior. Similarly, with a fixed entity theory, one would anticipate potentially more generalizability and less specificity.

According to Dweck (Heyman & Dweck, 1998), persons who ascribe to an entity view of behavior are more likely to make helpless attributions. That is, if one believes that a behavior or trait is fixed and thus cannot be changed, that person is more likely to acquiesce to difficulties rather than believe that change is possible. In contrast, the incremental or malleable view of traits suggests that change is possible and thus one with this view may demonstrate more resilience in the face of difficulties. To the extent that ADHD behaviors are viewed as unchangeable, stable, and global (all attributions consistent with diagnostic criteria), one might expect more helpless or frustrated behaviors. Notably, another noteworthy point about Dweck’s work is that even if one ascribes to an entity view (i.e., attributes are fixed), control over events is still possible (see p. 269, Table 6 of Dweck & Leggett, 1988). Whether or not, control over an event is possible is seen to depend on the individual’s perception of the level to which they have the attribute in question.

Dweck (Dweck & Leggett, 1988) uses ability and intelligence as examples. For example, if the entity theory is ascribed for intelligence, whether or not one has control over events depends on the level of intelligence. If intelligence is high, control over an event (such as grade on a test) is possible (but not guaranteed). If intelligence is low, control is viewed as not possible. Thus, control over an event depends on the

characteristics and level of the (unchangeable) trait. For incremental theorists, control is seen as possible over the trait (intelligence in this example) and over events. However, if the trait is low, then control will require more time and effort. The potential application to the current study would be if ADHD is ascribed as an entity or incremental attribute. Whether or not behavior related to ADHD is controllable would further depend on the level of the attribute in the individual (this coincides potentially with whether or not an individual is seen as meeting severity sufficient to warrant a diagnosis).

The goal orientation is also seen as important (although less relevant to the current study). Using the example of intelligence, an entity theory of intelligence may increase the likelihood of performance (rather than learning) goals. Consequently, failure and struggle may result in helpless behaviors. In contrast, an incremental theory suggests that personality/intelligence is malleable. The goal thus is to learn behaviors so as to increase competence and the behavior is mastery oriented. Notably, Dweck's research focuses on implicit theories and the social inferences that stem from those theories.

While Dweck's work originally focused on intra-individual factors, it has more recently been expanded to consider judgments about others as well (Heyman & Dweck, 1998; Levy & Dweck, 1998). Recent research by Dweck and colleagues suggests that an "entity views of personality (and behavior) are associated with an increased tendency to make global negative judgments of others who commit transgressions (Levy & Dweck, 1998). Applying this to ADHD, an entity view might coincide with more negative views of child behavior qualified by the quantity of the trait. In contrast to entity view, if the trait is considered incremental or malleable, than judgments about that trait in oneself and others are seen to be less focused on the quantity but to revolve more around factors as to

how the trait is displayed in that particular situation and at that particular point in time.

In essence, entity theory lends toward more stable and global attributions whereas the incremental theory lends toward attributions that the trait or behavior is malleable, more situation specific (less global) and less stable.

How might Dweck's theory increase our understanding of maternal attributions about their children's ADHD behaviors? If ADHD is a fixed entity, control might be possible if the degree of ADHD is low (which might be subthreshold ADHD symptoms). If ADHD is viewed as an incremental trait, and thus malleable, control would be seen to depend on time and effort. Current theories of ADHD, do not coincide entirely with either an entity or incremental theory but rather ADHD as conceptualized today appears to have elements of both. Before understanding the implicit theories about ADHD, first understanding the particular attributes seems warranted, noting that a child's ability to control his/her behavior may be conceptualized both as a trait and an event. Adding in the component about behavior and goals, Dweck's work might suggest that parents who ascribe to entity theory of ADHD (or attributions coinciding with entity theory) might be less oriented toward learning goals or toward instructing their children. That is, if the trait is fixed, motivation to control events related to that trait may be inhibited. Thus, Dweck's theory and the complexities it may address might be investigated after additional initial studies regarding attributions and ADHD.

In summary, although Dweck's research applies to perceptions of others, the decision in the current study was to examine parent beliefs about ADHD at the attribution level rather than at the level of Dweck's implicit theory. While Dweck's work has implications for the study of parents' goals and behaviors toward their children, the focus

of the current study is on parental adjustment. Further research examining parental behaviors may consider the implicit theories parents hold about their child's ADHD building upon potential results of the current study. Despite this, it is noted that Dweck and colleagues (Levy & Dweck, 1998) found that individuals who ascribe to an entity theory, tend to make more stable dispositional, stable trait inferences and to explain the causes of behaviors in terms of an individual's traits rather than to circumstances or goals whereas incremental theorists tend to explain causes of a person's behavior in terms more situational factors. These findings support the co-occurrence of stable, uncontrollable, global attributions for events if ADHD behavior is seen as uncontrollable and fixed.

Thus, the social cognitive literature lends theory as to what attributions may be important in studying parental beliefs about their child's ADHD behaviors. Notably, all three primary theories reviewed suggest that stability and globality would be associated with poorer maternal adjustment. The roles of locus and control are less clear. *Learned helplessness theory suggested that attributions that internal and uncontrollability* attributions would be associated with poor adjustment whereas Weiner's research indicated that *internal and controllable* attributions were associated with more negative response from help-givers. Thus, current study hypothesis pertaining to parents attributions about child disruptive behaviors in relation to parent adjustment were exploratory but of utmost interest.

Given this literature, it is useful to understand findings in relation to parents and their children. Only a small literature has examined attributions in parents of children with ADHD; thus, consideration is given to the growing literature which links parent attributions to parental emotional and behavioral responses to their children generally.

Maternal Attributions

Maternal Attributions and Adjustment in Community Samples

In recent years, family and developmental psychologists have begun to study parent attributions in relation to parental affective and behavioral responses to their children (Bugental, Johnston, New, & Silvester, 1998; Dix & Grusec, 1985; Miller, 1995). In a review, Miller (1995) delineated both what “attribution” generally refers to and also why attribution theory may be of interest to persons working with children and families. First, although attributions have been operationalized in varying ways, Miller purports that attributions refer to “the ways in which we explain and evaluate behavior” (Miller, 1995, p. 1557). According to Miller and others (Johnston & Freeman, 1997; Smith & O’Leary, 1995; Wright, Partridge, & Williams, 2000), parent attributions may influence the ways parents affectively and behaviorally respond to and interact with their children and may affect treatment decisions (Wright et al., 2000). In order to ease readability, key empirical findings are summarized in Appendix A.

Studies have been conducted with parents of nonselected children with presumed normal range behavioral adjustment, further elucidating the importance of the “learned helplessness” dimensions in determining parental adjustment to their children’s behaviors in general. Dix and Grusec (1985) found that the more parents of non-disordered children viewed children’s behavior (in vignettes) to be internal and controllable (by the child), the more *upset* the parents reported they would be. In a series of studies, Dix and Grusec (1985) found that parents viewed *self-control as internal and controllable* whereas lack of effort and lack of ability were viewed as internal and uncontrollable.

Misbehaviors that parents viewed as internal, controllable, and dispositional (stable) were rated by parents as likely to be upsetting to them. Dix and Grusec concluded that “self-control problems are, thus, upsetting and important to respond to” (1985, p. 224). This work suggests that attributions that children’s behaviors are internal and controllable are likely to be associated with increased parent stress if coupled with high levels of child misbehavior. The existing research suggests that parent role adjustment may be linked to parental attributions and that this relation might be mediated by actual child misbehaviors. Taken together the studies with adults and parents of non-disordered children suggest that internal, controllable, and stable attributions for misbehaviors are associated with increased parental stress.

An additional study, using a convenience sample of parents (through a mailed survey sent randomly to unselected community participants), Geller and Johnston (1995) found that on self-reported measures, attributions of more internality and controllability for child non-compliance was related to less investment in parenting and more intense parenting responses.

In summary, attributions appear to be related to parents’ emotional responses to their children. Further, according to Dix and Grusec’s (1985), attributions related to “self-control” problems are of particular relevance to parental adjustment. This work suggests that parent attributions about children’s misbehavior are likely to be significantly related to parent role-stress. Because so little research exists on attributions made by parents of children with ADHD, literature on attributions pertaining to other externalizing behaviors (namely, aggressive behavior and conduct problems) pertaining to controllability is first reviewed.

Attributions in Parents of Children With Behavior Disorders.

Parental attributions may differ for parents of children who exhibit substantial problem behaviors compared to parents of non-disordered children with average range problems. For example, mothers of children who display non-compliant, oppositional, or aggressive behaviors (in some studies meeting diagnostic criteria for Conduct Disorder), rated their children's misbehaviors as more intentional compared to mothers of non-disordered children (Baden & Howe, 1992; Bickett, Milich, & Brown, 1996; Dix & Lochman, 1990; Strassberg, 1995). For example, Strassberg (1995) found that mothers of *oppositional, non-compliant boys made greater attributions of defiant intent* compared to mothers of non-disordered boys. Strassberg's (1995) findings related to mothers of disordered children contrast with Gretarsson and Gelfand's (1988) findings pertaining to mothers of non-disordered children. Mothers of non-disordered children attributed child misbehaviors to external, uncontrollable, and transient factors whereas child positive behaviors were attributed to internal, controllable, and stable factors.

One particularly interesting study (Bickett, Milich, & Brown, 1996) found that mothers of aggressive boys were more likely than mothers of non-aggressive boys to infer negative motives and dispositions when explaining their sons' behavior. These mothers did not make more negative attributions when explaining a hypothetical child's behavior, they only did so when discussing their own son's behavior. These mothers exhibited a "hostile attributional bias," a phenomenon well-established in aggressive children (Crick & Dodge, 1994; Dodge, 1985). It represents a tendency of aggressive youth to attribute hostile intent in ambiguous social encounters (Dodge, 1985). Bickett,

Milich and Brown's (1996) study broke new ground in this line of research, finding that not only did aggressive boys in their study exhibit a "hostile attributional bias," but their mothers did as well. Bickett, Milich, and Brown (1996) suggested that this bias may be exhibited first by mothers and modeled to their sons. Because Bickett, Milich, and Brown's study was correlational, direction of effects is uncertain. Although parents of aggressive children exhibited biased attributional styles, it is uncertain, how these attributions relate to parental adjustment.

In a study comparing mothers of conduct-disordered and non-conduct disordered boys, Baden and Howe (1992) found that mothers of boys with conduct-disorders were more likely to attribute their children's misbehavior to *stable and global causes and more likely to see the behavior as beyond the parent's control*. Mothers of disordered and non-disordered children did not differ in the extent to which misbehavior was seen to be controllable or uncontrollable by the child. Because the internal consistency of the locus subscale (internal vs. external) showed that scale to be unreliable, Baden and Howe did not analyze that attributional domain. This study suggested that mothers of conduct-disordered children believe the causes of their children's behavior to be stable, global, and uncontrollable. It may be these attributions serve a self-protective function, preserving the parents self-esteem because although they see the child's behaviors as stable and global they are seen as not within parental control. Alternatively, they may be depressogenic attributions; parents may be giving up control due to failed attempts at control.

Baden and Howe (1992) also examined parents' expectations about the effectiveness of their parenting behaviors, finding that parents of disordered children felt

their parenting was less effective. The causal pathway of these relations is unclear. It is possible that attributions about parenting and their child's behavior are made after persistent negative encounters with the child's disruptive behavior or that parental attributions and stress contribute to children's aggressive behavior akin to a "self-fulfilling prophecy." A self-fulfilling prophecy would exist if parent's beliefs led to particular parent behaviors that in turn resulted in the child behaving in such a way that fulfilled those parental beliefs.

A Self-Fulfilling Prophecy

Although not a study of parent attributions, a recent study of unacquainted children suggests that at least amongst peers, children may have expectations about the behavior of someone diagnosed with ADHD. In a study of 68 pairs of unacquainted boys in Grades 3-6, Harris and colleagues (Harris, Milich, Corbitt & Hoover, 1992) examined interactions following a belief manipulation. In each dyad, a non-disordered child was told that his partner had a behavioral problem or was given no information that might lead to a preformed attributional expectancy. Sometimes the target child actually had ADHD and other times the child did not. Interactions were more disruptive when the target child had ADHD or when the target child had been identified as having a behavior disorder (even when the child did not have such a disorder). This study demonstrated that labeling a child as ADHD adversely affected peer interactions even when the labeled child did not truly have ADHD. These findings suggest that negative attributions or expectations about ADHD may result in worse behavior from the target child. The direction of effects is unknown. It cannot be concluded whether the target children adjusted their behavior to meet expectations or whether the other children treated the

labeled children differently precipitating different behavior. If children with ADHD are treated differently due to labeling effects, they may adjust their behavior accordingly. Their beliefs about themselves may change as well. Some researchers (Bickett, Milich, & Brown, 1996; Strassberg, 1995) suggest that mothers of aggressive children may make attributions that result in an increase in their child's misbehaviors in a "self-fulfilling prophecy" fashion.

This line of research points to the importance of examining parental beliefs and attributions about children's ADHD diagnosis and children's misbehavior. Because we know that children with ADHD are at risk for developing aggression (Anderson et al., 1987), the examination of attributions made by parents of children with ADHD in relation to their children's misbehaviors is a logical extension of the work with parents of conduct-disordered children. Currently, a few studies have begun to investigate attributions made by parents of children with ADHD.

Attributions made by Parents of Children with ADHD

The study of attributions made by parents of children with ADHD is a relatively new area of research. Most studies of attributions in relation to ADHD have focused on attributions made by the child (Rosen, O'Leary, & Conway, 1985). Indeed, relatively few studies have examined parent attributions about children in families with an ADHD child, yet parental attributions are thought to affect parents' adjustment, behaviors toward their child, and treatment choices pertaining to their child's ADHD (Edwards, Schulz, & Long, 1995; Hoza et al., 2000; Wright, Partridge, & Williams, 2000) as well as parenting behaviors in general (Hoza et al., 2000; Slep & O'Leary, 1998), general parental

adjustment (Podolski & Nigg, 2001) and outcomes for children with ADHD (Hinshaw et al., 1997; Hoza et al., 2000).

Findings pertaining to parental attributions about their child's ADHD vary. Johnston and Freeman (1997) and Johnston, Reynolds, Freeman, and Geller (1998) found that parents of children with ADHD rate hyperactive and oppositional behaviors as less controllable by the child, and more stable compared to ratings made by parents of non-disordered children. Sobol, Ashbourne, Earn, and Cunningham (1989) found that mothers of children with ADHD rated the child's behavior as less stable compared to mothers of non-disordered children. Both groups of researchers found that parents of children with ADHD generally believe that their child's misbehavior is not within the child's control. In fact, Sobol et al. (1989) found that parents of children with ADHD believed that their own (parental) role in "causing" (as measured by causal attributions) the child's misbehavior was unstable and uncontrollable. That is, whereas parents of non-disordered children apparently feel responsible for their child's misbehavior (Johnston & Freeman, 1997), parents of children with ADHD believed that due to ADHD, their child's behavior was out of both the child's and the parent's control (Johnston & Freeman, 1997; Sobol, et al., 1989).

As suggested by the study with unacquainted peers (Harris et al., 1992), attributions made parents of children with ADHD may exemplify the power of the diagnostic label to influence beliefs. Alternatively, parental attributions may be driven by experiences with their child's misbehavior over time. Notably, attributions that children with ADHD cannot control their misbehaviors are consonant with prevailing views about the biogenetic nature of ADHD.

Findings pertaining to parent attributions about locus of control (internal vs. external) are unclear and differ based on child's medication status. When comparing parents of children with ADHD to parents of non-disordered children (without medication status controlled or examined), Johnston and Freeman (1997) found that parents of children with ADHD believed inattentive-overactive and oppositional defiant behaviors were more internally caused, less controllable, and more stable. When comparing maternal attributions for child behavior when the child was medicated versus not medicated, Johnston, Fine, Weiss, Weiss, Weiss, and Freeman (2000) found that mothers of children with ADHD rated their child's negative behaviors as more externally caused when the child was medicated compared to when the child was unmedicated. These findings once again suggest that attributions made by parents of children with ADHD coincide with what might be expected given the prevailing biogenetic model of ADHD (Tannock, 1998).

Notably, the attributions made by parents of children with ADHD may exemplify a self-esteem preserving attribution by parents of difficult children. Or they may simply be an accurate reflection of reality. In any event, these findings indicate the need to develop further consideration of how these parents view child problems. If self-protective, one might expect them to be related to lower parental role-stress. However, if an accurate reflection of reality, they may be related to increased role-stress. Consideration of attributions made by parents of children with ADHD in relation to their role-adjustment is a logical next step.

Attributions and Adjustment When a Child has ADHD

Two recent studies provide links to parent-role adjustment. In a recent study of 100 mothers and 57 fathers of children with ADHD, Hoza and colleagues (2000) found that both mothers' and fathers' attributions of non-compliance to child's lack of effort were related to low parenting efficacy. Although they did not compare parents of children with ADHD to parents of non-disordered children, this study provided evidence of a link between parental attributions and self-reported emotional response.

Hoza and colleagues (2000) also investigated parental attributions in relation to parenting behaviors and child treatment outcome as part of a study of ADHD interventions. As noted earlier, research with non-ADHD samples suggests that parent attributions are likely to be related to parental adjustment, parenting behaviors, and child behaviors. In the study with ADHD sample, Hoza and colleagues (2000) found that parental attributions about their children were significantly and strongly ($r=.83$, $p<.01$ for mothers; $r=.29$, $p<.05$ for fathers) related to discipline. Specifically, for both mothers and fathers, attributions of child misbehavior to low child effort were related to dysfunctional discipline strategies by parents. Although the relation between parent attributions and child treatment outcomes was less clear, Hoza found that parental adjustment (maternal low self-esteem, paternal low parenting efficacy) predicted worse child treatment outcomes in a subset of the Multimodal Treatment Study of ADHD. Their study suggests that both (a) parent attributions about their child and (b) parental role-adjustment may be related to child outcome.

Although not examining attributions about the child's misbehavior per se, a recent study by the current author found that parents' self-reported cognitive reframing of

family problems related to their child with ADHD was related to lower parental stress levels and mediated the relation between child misbehavior and parental role-adjustment (Podolski & Nigg, 2001). This finding suggested that attributions play an important role in parental adjustment to children's ADHD. Specifically, when parental attributions are associated with the possibility of efficacy behavioral responses, parents are likely to experience lower levels of stress. However, given the nature of ADHD, it is possible that parents may believe that their child's behaviors are not controllable. Following the above reasoning, this might be related to an increase in stress. The current study examined specific attributions about the child's misbehaviors in relation to parental adjustment in order to elucidate additional cognitive attributions that might be related to parent role-stress.

Summary and Critique

The few existing studies of attributions made by parents of children with ADHD indicate that parents believe that when a child has ADHD his/her misbehaviors are internally caused, uncontrollable by the child, and stable (Johnston & Freeman, 1997; Johnston et al. 2000). How these attributions are related to parental adjustment remains unclear. While studies of parents with non-disordered children have indicated that internal, controllable, and dispositional (stable) attributions for children's misbehaviors are most upsetting to parents (Dix & Grusec, 1985), Hoza et al.'s (2000) study with parents of ADHD children suggests that internal and uncontrollable attributions (as measured by "low effort attributions" are related to low parenting efficacy. It is possible that the relation between attributions and adjustment is moderated by child diagnosis (or severity of child behaviors). Notably, Hoza et al. (2000) only assessed two domains of

attributions (effort and locus of control). Although theorists (Dix & Grusec, 1985) have speculated that low effort attributions are equivalent to internal and uncontrollable attributions, this remains to be tested in ADHD samples. A major weakness in the existing literature is the failure to examine parent role-adjustment in relation to multiple domains of attributions.

The current study attempted to replicate and further Johnston's study regarding the pattern of attributions made by parents of children with ADHD and to explain Hoza et al.'s (2000) findings regarding possible relations between parent attributions and adjustment. Importantly, the proposed study tested the relation between (a) parent attributions and (b) parent role-stress, with severity of child disruptive behaviors controlled. This had not been done in prior studies and yet was considered important in order to test whether parent attributions about child behaviors are independently related to parental adjustment above and beyond severity of child behavioral problems. It was hypothesized that parental attributions about their child's misbehaviors would be related to role-stress above and beyond that accounted for by their child's misbehaviors (as measured by parent ratings; see method). Because the diagnostic label also might have a significant role in predicting parent adjustment, the study also aimed to test whether child diagnosis moderated a potential relation between child behavior and parental adjustment. Thus the study aimed to explicate not only whether parental attributions were related to parental adjustment to their children's disorder but also possible pathways of this relation.

CHAPTER 2

LITERATURE REVIEW FOR STUDY 2: CHILD ATTRIBUTIONS

A second exploratory portion of the study was to examine child attributions. Through modeling and indirect instruction, children may learn schemata about their own behaviors through parents' actions and statements. Thus, children may learn attributions about their own behaviors from hearing their parents verbalize attributions. A primary complication in understanding attributions in relation to ADHD is that the literature suggests that attributions differ depending on diagnosis. Specifically, as reviewed in the prior section, the literature on parental attributions suggests that attributions in parents of children with ADHD may operate differentially compared to the way they function in parents of children without a disorder. The literature on child attributions suggests similarly that the relation between attributions and adjustment may differ for children based on their ADHD status, with the relation differing from what has been found within the general attribution literature.

Children's attributions may be linked to their adjustment in several ways. For example, as will be reviewed in more detail, given the relation between "helpless attributional styles" and helplessness in adults it was expected that a similar pattern of "helpless" attributions and behaviors would be associated with worse adjustment in children. Early research of attributions in children found some surprising results. Additionally, when these attributions were studied in children with ADHD, the findings were mixed. As outlined below, when examining attributions made by children with ADHD, some authors outlined a pattern of "helpless" attributions and academic behaviors whereas others argued that a similar style may serve a self-protective function

in children with ADHD (Carlson, Mann, & Alexander, 2000; Johnston, et al. 2000; Milich, 1994). The early studies of “helplessness” in children will be reviewed followed by a review of the initial studies of children with ADHD.

“Helplessness”and “Mastery” Attributions.

Some of the initial research on children’s attributions was conducted by Dweck (Dweck & Reppucci, 1973) and examined attributions of responsibility pertaining to academic tasks. These early studies with non-disordered children suggested that external attributions of responsibility were related to quitting behaviors. These findings contrasted with the learned helplessness literature that internal locus of control was related to helplessness when adults faced failures.

Using attributions about responsibility, Dweck (Dweck, 1975; Dweck, Goetz, & Strauss, 1980; Dweck & Reppucci, 1973) reported that children who were gave up in the face of failure, “took less personal responsibility for both successes and failures.” This “helpless” behavior corresponded with “external” rather than “internal” responsibility attributions. The amount and sequencing of successes and failures was experimentally manipulated so that the children received the same experience (in terms of number and order of successes and failures on the tasks). Despite the experimental manipulation, differences in behavioral responses and attributional styles were found. As noted above, “helpless” behaviors (lack of effort) were associated with external attributions. In contrast, children who made internal responsibility attributions were more likely to respond with effort and were termed “mastery-oriented.”

Notably, Dweck's findings differed from the general "learned helplessness" model in adults (Peterson, Maier, & Seligman, 1993). Whereas Dweck found "external" attributions to be associated with passivity, Peterson had found "internal" attributions for negative events to often be associated with helplessness. (Internal attributions for positive events were associated with optimism and good adjustment).

A few noteworthy differences between the studies may have accounted for the different results. First, the events in Peterson's early studies were clearly "uncontrollable" whereas in Dweck's study controllability was not directly assessed. In Peterson's later studies, in using events that could be deemed either controllable or uncontrollable by the participant; Peterson still found that internal attributions for negative events were associated with depression (Peterson & Barrett, 1987). Additionally, adult learned helplessness studies examined attributions for positive and negative events separately, finding that "internal" attributions for negative events were often associated with depression and that internal events for positive events were consistently related to good adjustment. The differences between Dweck and Peterson's findings indicate that other factors must be considered in addition to the internal versus external dimension of attributions and that the valence - positive versus negative - of the events considered is important.

Performance Attributions by Children With ADHD.

Because children with ADHD experience numerous academic frustrations (Barkley, 1998), it is plausible that their academic failures may be related not only to poor attention but also to a "learned helplessness, pessimistic" belief system and response

style. Although beliefs and attributions held by children with ADHD have been examined, the findings offer mixed results.

Helpless Style

In a study of the effects of reward and response cost (as a punishment), Carlson, Mann, and Alexander (2000) found that children with ADHD endorsed a “less adaptive attributional style” compared to non-disordered children. Carlson and colleagues (2000) found that children with ADHD (n=40; 27 boys, 13 girls) were more likely than matched non-disordered children (n=40) to attribute positive events to luck (external, uncontrollable) and poor performance to lack of effort (internal, controllable). The children with ADHD made less internal, stable, and global attributions for positive events and more internal, stable, and global attributions for negative events relative to non-disordered children. Such explanations are inconsistent with Peterson’s optimistic explanatory style¹ but consistent with Peterson’s pessimistic explanatory style². Unsurprisingly, Carlson and colleagues concluded that children with ADHD displayed a “less adaptive attributional style.”

Carlson et al.’s (2000) findings also are consistent with a learned helplessness response. Notably, Carlson also found that children with ADHD were less likely to make internal and more likely to make external attributions for positive events, a pattern which is opposite of an “optimistic explanatory style.” Carlson et al.’s (2000) findings also indicated that attribution/behavior patterns of the children with ADHD were similar to those exhibited by children with learning disabilities. A study on attributions in children

¹ Optimistic explanatory style: Stable, internal, specific attributions for positive events. May also involve: external, unstable, and specific attributions for bad events.

with learning disabilities found that internal attributions for poor performance were associated with decreased effort (Licht et al., 1985) in contrast to the “mastery” behaviors associated with internal attributions in non-disordered children (Dweck & Leggett, 1988). Also, when asked about how well they thought they performed, children with ADHD also reported poorer performance compared to controls (Carlson et al., 2000). In terms of actual performance, children with ADHD attempted fewer problems, got fewer problems correct, and received a lower percent correct ratio compared to control children. Hence, Carlson et al. (2000) found internal attributions for negative events and external attributions for positive events to be associated with poor performance in children with ADHD on an academic task.

Similarly, Hoza, Pelham, Waschbusch, Kipp, and Owens (2001) found that ADHD boys endorsed attributions that were more external for successes and less internal (more external than controls even though still internal attributions) for failures. Hoza and colleagues (2001) found the ADHD boys performed worse and were rated as more uncooperative and less effortful. They solved fewer puzzles and quit working more often. Hence, Hoza et al. concluded that external attributions were associated with less effort. Notably, Hoza et al.’s finding that internal attributions for failure were endorsed less strongly by ADHD boys compared to controls is consistent with a possibly protective attributional style. [Note, as shown in Appendix B, according to Peterson (Peterson, Maier, & Seligman, 1993), internal attributions for failure are associated with sadness and depressed mood; see Appendix A]. However, Hoza et al.’s finding that ADHD boys made more external attributions for successes is inconsistent with an optimistic explanatory style and instead likely consistent with helplessness so they may show both a

² Pessimistic explanatory style: stable, internal, global, uncontrollability attributions for negative

protective and helpless bias depending on context. Hoza and colleagues also included a measure of the child's disruptive behavior. Research assistants rated the boys levels of effort and cooperation during the tasks. ADHD boys were rated as being less effortful and cooperative, but the ratings were not related to the boys' attributions.

Protective Style

In contrast to the idea that children with ADHD endorse "helpless" attributions, Milich (1994) has argued that external attributions for poor performance may be adaptive in children with ADHD. Whereas Dweck and Leggett (1988) found external attributions for poor performance to be associated with "helpless" behaviors in non-disordered children, Milich (1994) did not find external attributions for poor performance to be related to "helpless behaviors" in children with ADHD. Notably, according to Peterson's learned helplessness theory, internal attributions for poor performance are related to depression (Peterson & Barrett, 1987; Sweeney, Anderson, & Bailey, 1986). Milich (1994) reviewed multiple studies conducted by himself and his colleagues and concluded that *external attributions were not related to poor adjustment in children with ADHD*. Milich (1994) argued that although many children with ADHD experience greater frustration and may give up, these "helpless" behaviors may not be associated with "helpless" attributions. Rather Milich (1994) argued that what are commonly seen as "helpless" attributions may be related to more beneficial coping in children with ADHD. This program of research is next summarized.

Milich and Okazaki (1991) put Dweck's hypotheses (that external attributions were related to helplessness and internal to mastery) directly to the test in children with

ADHD. They found that boys with ADHD solved fewer word puzzles than non-disordered boys, gave up more often, and reported more frustration. Thus, some support was found for “helpless” behaviors in boys with ADHD. However the “helpless” attributional style as defined by Dweck did not appear to operate in boys with ADHD as would have been predicted. Using a median split on the Intellectual Achievement Responsibility Scale (Crandall, Katkovsky, & Crandall, 1965), Milich and Okazaki (1991) found that *boys who made external attributions for failure also reported trying harder when compared to the boys who made effort (internal) attributions.*

Milich and Okazaki’s (1991) findings appear to contrast with Dweck and Leggett’s (1988) finding that boys with high effort attributions worked more persistently and had a “mastery-oriented” style whereas boys with low effort (and high external) attributions worked less persistently and displayed a “helpless” style. Notably, Milich’s findings are not inconsistent with Peterson’s (Peterson, Maier, & Seligman, 1993). The latter found that internal attributions for positive events were related to good adjustment but that internal attributions for negative events are related to poor adjustment in non-disordered adults. In fact, Milich and Okazaki’s (1991) findings of external attributions for negative events are more consistent with Peterson’s “learned helplessness” than are Dweck’s findings that external attributions are related to helplessness. It is also noteworthy that when using a median split Milich found that some boys with ADHD made internal attributions for failure whereas some boys with ADHD made external attributions for failure. Unlike Carlson et al. (2000), Milich and Okazaki (1991) did not compare children with and without ADHD. Milich and Okazaki (1991) also did not look

at different attributions within the ADHD group, or compare attributions made by boys and girls.

Milich (1994) proposed that, for children with ADHD, external attributions for failures may be more adaptive than internal attributions in contrast to Dweck's conclusions based on finding in non-disordered children that internal attributions (for both failure and successes) were related to more effort. Indeed, in the Milich and Okazaki (1991) study, Milich also found that boys who made effort attributions for failure (internal attributions) were more likely to perform like "helpless" children, whereas ADHD boys who made external attributions for failure exhibited an adaptive behavioral response. Milich (1994) concluded that attributions that may be deleterious for non-disordered children may be adaptive for children with ADHD. Recall that the internal attributions for negative events were part of the "pessimistic explanatory style" elucidated by Peterson (Peterson, Maier, & Seligman, 1993), who examined attributions for uncontrollable events. Once again, it seems that whether the individual rates the event as uncontrollable and external versus uncontrollable and internal may be important.

Milich and other researchers have also compared attributions and persistence behaviors of children with ADHD when taking medication for ADHD to their attributions and behaviors in a placebo condition (Carlson, Pelham, Milich, & Hoza, 1993; Milich, Carlson, Pelham, & Licht, 1991; Milich, Licht, Murphy, & Pelham, 1989; Pelham et al. 1992). In these studies, Milich and colleagues consistently did not find evidence that medication was associated with handicapping attributions. For example, Milich, Licht, Murphy, and Pelham (1989) studied ADHD boys' attributions for performance when on medication and when on placebo, finding that regardless of medication status, the ADHD

boys attributed success to own their own effort, and they did not use medication as an explanation for successes. This study further supported Milich's notion that ADHD boys did not make deleterious attributions. Rather boys seemed to make internal and controllable attributions for positive events and external (and possibly, although not tested by Milich, uncontrollable) attributions for negative events. Thus, Milich (1994) concluded that ADHD boys may hold a self-benefiting/protective bias.

To summarize, the bulk of the studies on children with ADHD found external attributions for failure an attributional style consistent with better adjustment. These studies are in contrast with Dweck's definition of helplessness in non-disordered children but consistent with Peterson's theory about depression. External attributions for successes, however, were not consistent with positive adjustment. Finally, studies of children with ADHD differ in their findings in regard to locus attributions. Milich and colleague's work suggests that boys with ADHD made internal attributions for success but Hoza and colleagues found opposite results.

Notably, the literature reviewed above pertains to child beliefs in relation to academic type tasks. These studies did not examine child attributions in relation to co-morbid problems, such as aggression, so common in children with ADHD. Given that attributions are likely to affect child personal and social interactions, these non-academic outcomes deserve attention and may elucidate results pertaining to parent as well as child attributional ratings of child disruptive behaviors.

Attributions About Disruptive Behaviors

A body of literature has examined attributions about misbehaviors made by children who act out aggressively (Dodge & Coie, 1987; Hudley & Graham, 1993) and by children with ADHD (Johnston et al. 2000). Children who are aggressive tend to view others aggressively (Dodge & Coie, 1987; Graham, Hudley, & Williams, 1992; Hudley & Graham, 1993). Also, studies find “halo effects” between ratings of defiance and hyperactivity. For instance, Schachar, Sandberg, and Rutter (1986) found that when a child behaved defiantly, he was also likely to be rated as hyperactive or inattentive regardless of his observed level of activity. Aggression is the most common co-occurring problem for children with ADHD and is associated with poor short and long-term outcome. Despite these findings, few studies have examined beliefs or attributions about disruptive behaviors made by children with ADHD.

Because aggressive and oppositional/defiant behaviors are as important (or possibly more important) as ADHD symptoms in predicting the long-term outcome of children with ADHD (Hechtman & Weiss, 1983), some studies have begun to measure children’s attributions about these behaviors. Two known studies have measured children’s attributions about ADHD and aggressive/defiant behaviors.

First, in a study of 74 non-disordered children, Johnston and Leung (2001) examined attributions about a video-taped child’s ADHD behaviors. Children were told that the child was receiving either: a) no treatment, b) medication only, c) medication plus behavioral treatment. The children (all boys) saw ADHD behaviors as more controllable by the child when treatment involved a behavioral component. Noncompliance was seen as more intentional and marginally more controllable if the

child was receiving treatment but controllable when treatment involved behavior management. Child self-attributions were not assessed.

Secondly, using a sample of 86 children with ADHD, Johnston and colleagues (Johnston et al. 2000) examined the attributions about their own behavior in relation to their medication treatment. These children rated their compliance and noncompliance as more controllable when they were on medication. Also, Johnston et al. (2000) compared children's attributions on a forced-choice measure and found that children ascribed compliance to ability, effort, and the task for their behaviors off-medication but ascribed compliance when on medication to "pill-taking." These findings appear to mirror the early anecdotal reports (Rosen, O'Leary, & Conway, 1985; Whalen & Henker, 1991). The effects of ascribing compliance to medication are unknown but some theorists purport that such attributions might have negative effects on children's self-esteem.

Although not a study of attributions per se, the study of self-esteem is one way in which beliefs about the self has been assessed in children with ADHD. A prospective study of adolescent hyperactive children (Slomkowski, Klein, & Mannuzza, 1995) found that hyperactive boys reported lower self-esteem as adolescents, had lower educational and occupational ranks as adults, and had lower overall adjustment compared to non-disordered control subjects. Although not examining beliefs about ADHD, these hyperactive individuals did have negative self-perceptions as measured by a self-esteem measure. As is commonly the case in ADHD studies, information on girls was not available.

Despite this finding, other studies indicate that children with ADHD do not have lowered self-perceptions (Hoza, Pelham, Milich, Pillow, & McBride, 1993). For

example, in a study of 27 boys with ADHD (with and without CD combined, no differences found when examined separately) and 25 boys without disorders (ages 8.5 to 13), Hoza and colleagues (1993) did not find differences in self-perceptions and attributions when comparing boys with and without ADHD. Notably, seventy percent of the boys with ADHD had internalizing symptoms that were clinically significant compared to only 20% of the non-disordered boys. Due to the presence of internalizing symptoms in the ADHD sample, the authors compared self-perceptions and attributions both without and with controlling for internalizing symptoms. Hoza and colleagues found that boys with ADHD were more likely to attribute positive social outcomes to themselves and less likely to attribute negative outcomes to internal causes; these findings held even when controlling for internalizing symptoms. Such attributions would be consistent with a “self-protective” bias. However, in contrast to a “self-protective” attributional style, boys with ADHD were more likely to make stable and global attributions for negative events; when controlling for internalizing symptoms, the boys with ADHD were still found to make stable but not global attributions for negative events. This study further underscored the importance of examining factors in addition to the internal/external locus. Due to low power, results must be interpreted with caution.

Critique of Current Findings with ADHD Children

Results pertaining to attributions made by children with ADHD are mixed. A series of studies by Milich (Hoza, Pelham, Milich, Pillow, & McBride, 1993; Milich, Carlson, Pelham, & Licht, 1991) suggests that external attributions in ADHD may be

helpful (self-protective) in contrast to what is found with non-disordered children.

However, more recent research suggests that children with ADHD make attributions which are consistent with learned helplessness and with “helpless” behaviors (Carlson et al., 2000; Hoza et al., 2001); for example, Carlson et al. (2000) found that boys with ADHD made internal attributions for poor performance. The lack of consensus within the literature points to the need for additional studies.

Most studies examining attributions in children with ADHD, including those by Milich (1994), Carlson et al. (2000), and Hoza et al. (2001), did not measure attributions pertaining to controllability. Most studies, including those by Milich (1994) and by Hoza et al. (2001) focused on the locus (internal vs. external) dimension, failing to measure stability, globality, or controllability. Recent work by Peterson and Bossio (1991) has found that internal locus for bad events is not consistently related to negative adjustment. For example, Peterson and Bossio (1991) found that stability and globality but not internality was related to poor health outcomes. Given these recent findings, the failure of attribution studies to include measures of stability and globality are serious. In fact, the mixed findings pertaining to attributions made by children with ADHD may be explained through these unmeasured dimensions. Additionally, most studies of children did not assess the extent to which events or behaviors was seen as “uncontrollable” yet this dimension appears crucial to the definition of “learned helplessness” put forth originally and likely plays an important role in all findings.

Additionally, the current literature indicates that whether internal or external attributions are related to positive outcomes for children with ADHD may depend on specific contexts and the specific behaviors (academic, general ADHD behaviors,

reading tasks, use of cognitive self-regulation and focus) being studied. Examination of actual disruptive behavior may be of greatest importance to understand long-term outcome; this outcome is also the least well studied. Presently, very few studies have examined attributions made by children with ADHD in relation to common co-morbid problems, such as aggression. Given that attributions are likely to affect child personal and social interactions, these non-academic outcomes deserve attention.

An additional common weakness in the ADHD literature and in attribution studies is the exclusion of the study of girls. To date, very few studies have examined the attributions of girls with ADHD. When studies included girls, gender may not have been analyzed due to limited sample size (Carlson, Mann, & Alexander, 2000). When analyzes were conducted separately for boys and girls (in non-ADHD studies), sex differences were found (Dweck, Goetz, & Strauss, 1980).

In conclusion, perhaps the most striking weakness in the literature is that despite contradictory findings regarding internal /external locus, most studies failed to assess other attribution dimensions, such as controllability, globality, and stability. Yet these factors have been found to discriminate depressed and non-depressed individuals (Peterson, Maier, & Seligman, 1993). Another central short-coming of existing literature is the relative paucity of studies examining attributions in relation to non-academic tasks in children with ADHD. This is a relatively new yet important line of research that merits further exploration. Notably, child aggression is important to study and arguably may be tied to children's attributions about their own disruptive behaviors.

Medication Effects

Reports of “deleterious” effects of beliefs in children with ADHD began with case studies about their beliefs concerning medication (Rosen, O’Leary, & Conway, 1985; Whalen & Henker, 1976). Specifically, the children with ADHD reported believing that their pill helped them behave well and feared that they could not do well without their pill (Rosen, O’Leary, & Conway, 1985). In these case studies, researchers and clinicians noted that children “worried about what would happen if they could no longer take pills” (Whalen & Henker, 1991, p. 237) and in some cases asked for pills to help behave (Whalen & Henker, 1976). Before experimental studies were conducted, therefore theorists had posited as to ways in which attributions about medication and ADHD might affect children.

In an early paper discussing possible socio-ecological effects of psychostimulants for children, Whalen and Henker (1976) outlined some possible attributional messages of medication. As part of this discussion, it is important to acknowledge the effectiveness of psychostimulants in ameliorating behavioral problems. Psychostimulants are effective in improving child restlessness, on-task behavior, compliance, and current classroom performance (Barkley, 1998; DuPaul & Barkley, 1990). These positive effects of medication are large and well documented (Abikoff, 1991; Greenhill et al., 2001; Richters et al., 1995; Vitiello et al., 2001). Although these positive short-term behavioral effects are indisputable, understudied is the socio-ecological message implicit in such treatments that may affect children’s psychological development in the long-term. According to Whalen and Henker (1976, p.1122), “medication prescribed for the

regulation of behavior . . . communicates to the child and to those around the child that a definable problem exists, most likely a physiological one, and that it can be alleviated through chemical means.” Whalen and Henker therefore hypothesized that stimulant treatment facilitates external attributions about problem solutions, such that children are not responsible for their failures or their successes. Such attributions could have protective effects in terms of the child not blaming him/herself for failure, but could have deleterious effects if the children’s failure to engage in behavioral control strategies within their capability and beneficial to their development resulted in inappropriate abdication of responsibility.

Conclusions from Literatures: Attributions and ADHD

Overall, the literature on both parent and child attributions indicate that the attributions endorsed by mothers of children with ADHD (and by children with ADHD) may both differ significantly both in the attributions that are endorsed and in the function of those attributions. The literature suggests that unlike mothers of children without a disorder, mothers of children with ADHD attribute misbehaviors to more stable, global, and uncontrollable causes whereas parents of children without a behavioral disorder tend to attribute child behaviors to uncontrollable and transient factors. The locus (internal versus external) dimension was less clear; however, parents of children with ADHD appear to make more internal attributions. The relation between maternal attributions about child misbehaviors and maternal adjustment has not yet been explored in a sample of parents of ADHD children using the domains primary attribution domains outlined above. Notably, the pattern of attributions endorsed by mothers of children with ADHD

(Johnston & Freeman, 1997) differs from the pattern that has been associated with parental stress in other samples of parents (Dix & Grusec, 1985). Thus, for both parents and children with ADHD, the pattern of attributions “normally” (in non-disordered samples) associated with poorer adjustment may be associated with better adjustment in an ADHD sample. That is, the pattern of attributions associated with poor adjustment may differ when considering ADHD. The controllability domain appears particularly different from prior studies for both parents and children. Notably, absent from the few existing studies is any examination of effects by subtypes of ADHD, both in terms of patterns of attributions as well as in terms of the attribution-adjustment relation.

RATIONALE AND PLAN OF STUDY

As outlined in the review of the literature, attributions may be an important factor in terms of maternal adjustment to their children's ADHD. Notably, multiple domains of literature within psychology point to the significance of attributions in adjustment. Studies within social cognitive psychology have documented that attributions are linked to a person's evaluation of and responses to others (Weiner, 1980). Studies within the child development literature indicate that mothers' attributions about their children's behavior are related to their affective and behavioral responses to that behavior (Dix & Grusec, 1985). Given the documented high levels of stress experienced by mothers of children with ADHD (Johnston & Mash, 2001; Podolski & Nigg, 2001) and the potential implications for both mothers' and children's welfare, understanding factors which might ameliorate or moderate that stress and its consequential results is important for researchers and clinicians alike. In order to expand the existing literature and lend knowledge which might be used for designing interventions, the current study aimed to extend knowledge about maternal attributions in a sample of mothers whose children have ADHD but also to examine these attributions in relation to mothers' adjustment and to child ADHD subtypes.

The proposed study had three overarching objectives. The first objective was to extend our knowledge of maternal attributions about child disruptive behaviors (hyperactivity and aggression). Attributions made by mothers of children with ADHD were compared to attributions made by mothers of children without ADHD to see if group differences existed (corresponds to hypothesis 1). In replication of Johnston and Freeman (1997) it was expected that mothers of children with diagnostic levels of ADHD

would make more internal, stable and uncontrollable attributions about children's disruptive behaviors compared to attributions made by mothers of non-disordered children.

In a "logical next step," the second objective was to examine specific maternal attributions about their children's misbehaviors in relation to mothers' own role-specific adjustment (satisfaction and stress; corresponds to hypothesis 2). Two competing hypotheses were tested. Based on the literature, it was expected that the relation between maternal attributions and role stress would differ based on child diagnosis (moderation by child diagnosis). It was expected that mothers of children with ADHD would experience greater levels of stress than control parents and that the relation between attributions and adjustment would be different for mothers of children with versus without ADHD.

Based on the general literature, it was hypothesized that internal, stable, and controllable attributions would be related to greater role stress among control parents. Thus, with child behavior controlled, this attributional pattern was expected to relate to maternal role stress (in replication of Dix & Grusec's research with families whose child did not exhibit a behavioral disorder (1985)). Notably, a different pattern of results was expected in mothers of children with ADHD. Mothers of children with ADHD were expected to attribute misbehaviors to uncontrollable causes whereas parents of children without ADHD were expected to attribute misbehaviors to controllable causes. For mothers of children with ADHD, role stress was expected to correlate with attributions of uncontrollable behavior. Thus, the attribution pattern associated with role stress was expected to differ for parents based on child diagnosis. Alternatively was the possibility

that maternal attributions would be related to adjustment independent of child behavior.

Mediation by child behavior was also tested.

The third objective was exploratory. This was to examine child attributions about disruptive child behaviors, examining multiple dimensions of attributions about misbehaviors (rather than academic performance as in prior studies). Using a newly adapted measure of attributions that provides multiple dimensions, the aim was to provide a more differentiated description of attributions and to examine non-academic behaviors. Because the measure was newly adapted and a range of ages of children were sampled, the primary expected contribution was the creation and piloting of the new measure with the hopes of examining possible different attributions made by children with and without ADHD. It was hoped that analyses would provide direction to future studies aimed at clarifying contradictory findings of uni-dimensional studies and thus extend the literature by examining attributions by children to real world disruptive child behaviors.

CHAPTER 3 METHOD

Participants

Participants were: 126 children, 125 mothers, and 114 teachers. For diagnostic comparisons, there were 51 children with DSM-IV ADHD, and 41 control children, and 34 children with subthreshold ADHD symptomatology. One child with ADHD hyperactive subtype was excluded from diagnostic comparisons. The 51 children with ADHD included: 38 children with ADHD-Combined subtype (ADHD-C; 30% of total sample), 12 children with inattentive subtype (ADD; 9%). The study focused on mothers of children with ADHD. Data was collected from 51 fathers, thus there were more children in the study than mothers as participation from both parents was not required. Recruitment of teachers was successful (n=114); teacher data was used for diagnostic purposes. Families were recruited through local school district mailings and from radio and newspaper advertisements in the community. Of the families in the study, 70 families also participated in a larger study on neuropsychological and familial markers of child ADHD. Thus, 55 families were recruited separately for purposes of this study. Just over half of those 55 families (27/55) were screened by the smaller study and may or may not have gone on to participate in the larger study after participation in the smaller study. Recruitment sources were the same but the latter families completed a shorter battery of measures and tests, given that they did not participate in Dr. Nigg's larger study.

Table 1 Child sample characteristics by diagnostic group

	Total Sample	Control	ADHD-C	ADHD-inattentive	ADHD subthreshold	F-test or Chi-sq P value
Sample size	126	41	38	12	34	
Boys/girls	55% 70/58	54% 22/19	74% 28/10	42% 5/7	41% 14/20	n.s. (P=.05)
Age	9.6 (1.5)	9.8 (1.6)	9.58 (1.2)	9.3 (1.5)	9 (1.7)	n.s.
Oppositional Defiant Disorder (% positive) (ODD/no ODD)	35% 45/83	5% 2/39	66% 25/13	25% 3/9	39% 15/19	n.s.
Reading Disorder % positive (yes/no)	10% 13/128	10% 4/37	8% 3/35	17% 0/12	11% 6/28	n.s.

Notes: 126 is total sample; for primary analyses n=125, number of mother participants)
For sex: 1=male, 2=female

Procedure

Parents completed a battery of self-report and child-rating questionnaires. In 114 cases (89%), the child's teacher also completed ratings of child behavior. Verbal consent was obtained over the phone, and mothers completed a brief set of child ratings over the telephone to screen families in or out of potential participation. If the family was screened in, parents were mailed a copy of the full study consent form (later discussed in a face to face meeting) along with a packet of questionnaires. The mother and target child (child within the specified age range) came to campus. Maternal consent and child assent were then obtained during a face-to-face meeting. The battery of questionnaires and tests were then administered. The battery of questionnaires administered through the mail and campus visit provided measures of three categories of variables: child behavioral adjustment, parent attributions, and maternal role-specific adjustment. Child attributions were also obtained for secondary analyses.

Measures

Child Behavior

Inattention-hyperactivity.

The ADHD Rating Scale-IV (DuPaul, Power, Anastopoulous, & Reid, 1998) was designed to capture both Inattentive and Hyperactive symptoms of ADHD based on the DSM-IV criteria. Respondents rated child behaviors on a four point Likert scale (“never or rarely,” “sometimes,” “often,” or “very often”). Example items rated include: “fails to give close attention to details or makes careless mistakes in schoolwork” and “Is ‘on the go’ or acts as if ‘driven by a motor.’” Each of the two subscales consists of nine items and has satisfactory reliability and validity. Reported reliabilities are high (DuPaul, Power, Anastopoulous, & Reid, 1998). For the parent form, reliabilities were: Inattention $\alpha=.86$ and Hyperactivity-Impulsivity $\alpha=.86$. Reliabilities in the current study (mother data) were: Inattention $\alpha=.94$, and Hyperactivity-Impulsivity $\alpha=.93$, Total $\alpha=.96$. In the current study, reliabilities for the parent form (father data) were: Inattention $\alpha=.94$, Hyperactivity-Impulsivity $\alpha=.91$, and Total $\alpha=.95$. For the teacher form, reported alpha reliabilities are: Inattention $\alpha=.96$, Hyperactivity-Impulsivity $\alpha=.88$, and Total $\alpha=.94$. Teacher form in current study, reliabilities were: Inattention $\alpha=.95$, Hyperactivity-Impulsivity $\alpha=.95$, Total $\alpha=.96$.

Behavior Assessment System for Children

The Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 1992) Parent Rating Scales and Teacher Rating Scales contain Hyperactivity and Attention Problems subscales. Items are rated on a 4-point scale, 0=never through

3=always. On the parent rating form, the Hyperactivity subscale consists of 10 items such as “cannot wait to take turn,” and “leaves seat during meals.” On the parent rating form, the Attention Problems subscale consists of 8 items such as “forgets things” and “is easily distracted.” Reported reliabilities are high for both hyperactivity ($\alpha=.83$), and inattention ($\alpha=.77$) (Reynolds & Kamphaus, 1992). Reliabilities in the current study were adequate for mother data (hyperactivity $\alpha=.90$; inattention $\alpha=.88$) and father data (hyperactivity $\alpha=.90$; inattention $\alpha=.86$). On the teacher rating form, the Hyperactivity subscale consists of 13 items, such as “rushes through assigned work,” “taps foot or pencil,” and “acts without thinking.” On the teacher rating form, the Attention Problems subscale consists of 8 items, such as “has trouble concentrating” and “is easily distracted from class work.” Reported reliabilities are high for both hyperactivity ($\alpha=.92$), and inattention ($\alpha=.87$) (Reynolds & Kamphaus, 1992). Reliabilities for teacher form within current study were good ($\alpha=.93$ for hyperactivity and $.94$ for inattention).

Conners' Scales-Revised-Short Forms

The Conners is another measure of disruptive behavior problems. For the parent Conners, the manual test-retest reliability coefficients were $.85$ and $.72$, for the Hyperactive subscale and (Conners, 1997). Internal reliabilities from our study for the parent Conners' were good for mother report ($\alpha=.92$ for Hyperactivity subscale and $\alpha=.96$ for the ADHD Index) and father report ($\alpha=.92$ for Hyperactivity subscale and $\alpha=.93$ for ADHD Index). For Teacher ratings, manual test-retest reliability coefficients were $.84$ and $.72$, for these scales respectively (Conners, 1997). In the

current sample, internal reliabilities for the Teacher Conners hyperactivity and ADHD scales were $\alpha = .92$ and $.95$, respectively.

Child behavior: Oppositional/disobedient.

The Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 1992) parent teacher Aggression and Conduct Problem subscales were used to measure child disruptive behaviors. The BASC parent rating form Aggression ($\alpha=.89$), Conduct Problems ($\alpha=.82$) and the BASC teacher rating form Aggression ($\alpha=.94$) and Conduct Problems ($\alpha=.74$) have established reliability and validity. Reliabilities within the current study were satisfactory for mother ratings (Aggression $\alpha=.89$, Conduct Problems $\alpha=.84$), father (Aggression $\alpha=.91$, Conduct Problems $\alpha=.89$), and teacher ratings (Aggression $\alpha=.94$). The reliability of the Conduct Problem subscale for teacher ratings was inadequate ($\alpha=.59$) and it was not included in subsequent analyses.

The Conners Rating Scale-Revised (Conners, 1997) Oppositional Behavior Subscale behaviors subscale also provided a measure of child oppositional/disobedient behavior. Parents and teachers rated children on a four point scale, 0=not true at all to 3=very much true. Example items include: "Angry and resent" and "argues with adults." Manual reported reliability for both parent ($\alpha=.92$) and teacher forms ($\alpha=.88$) are satisfactory. Alphas were also high within current study (mother rating $\alpha=.92$, father rating $\alpha=.93$, and teacher rating $\alpha=.94$).

ADHD Diagnosis.

A multistage screening and diagnostic process was used in determining child diagnosis.

At stage 1, children were considered possible ADHD in two ways. (a) They exceeded screening cut-offs on at least one current parent and teacher rating scale: Behavior Assessment Scale for Children (BASC, Reynolds & Kamphaus, 1992) hyperactivity or inattention scale $T > 60$, Conners (1997) Rating Scale hyperactivity index $T > 60$, or at least 4 symptoms of inattention or hyperactivity endorsed [with a rating of “2” or “3”] on the DuPaul ADHD Rating Scale (DuPaul, Power, Anastopoulos, & Reid, 1998). (b) They were previously diagnosed as ADHD by a physician or psychologist, who included teacher and parent ratings to make the diagnosis. Children were considered possible Controls if below cut offs on all parent and teacher scales and never diagnosed with ADHD in the community.

ADHD diagnostic assignment and subtype was then confirmed using an “or” algorithm with the Diagnostic Interview Schedule for Child DSM-IV diagnosis (DISC-IV). The “or” algorithm uses the parent Diagnostic Interview Schedule for DSM-IV (DISC-IV, Shaffer, Fisher, & Lucas, 2000) for parent rating of symptoms supplemented by available teacher ratings as described above. The DISC-IV is a structured diagnostic interview developed by NIMH. It implements a stringent diagnostic algorithm requiring onset before age 7, persistence of symptoms greater than 6 months, and symptom-specific impairment in at least two settings. Prior versions of the DISC have exhibited acceptable reliability and validity (Shaffer et al., 1993). The computer-assisted interview was administered to the child’s primary caregiver by trained interviewers. A symptom was counted as “present” if endorsed by mother or teacher. Provided all other criteria were met and they had at least four symptoms on the DISC-IV, those symptoms were added up to determine ADHD status and subtype. Cases with five symptoms of inattention or

overactivity by this method were placed in the “subthreshold” group. According to field trial data, they might have ADHD-C or ADHD-I (Lahey et al., 1994).

Parent Attributions

Parental attributions about child behavior were assessed using two primary measures: the Written Analogue Questionnaire and the Recalled Incident Interview. For exploratory analyses, an additional measure was used, namely Hoza’s Interactions Questionnaire. All three measures were designed specifically for studies of attributions about disruptive child behaviors. The first two measures separate attributions about child Inattentive-Overactive behaviors from child Disobedient/Non-compliant behaviors, and for this reason were used as primary measures for the current study. [Again, it is noted that attributions were about child’s not mother’s behaviors].

Written Analogue Questionnaire.

The Written Analogue Questionnaire (WAQ; see Johnston & Freeman, 1997) is a self-report questionnaire where parents rate 12 standard, hypothetical but common behavioral scenarios (4 for each of three behavior types: 1) inattentive-overactive, 2) oppositional- defiant, and 3) prosocial-positive). Before completing the set of questions, parents were given an explanation the attribution dimensions. After reading each scenario, parents rated on 10-point scales the (1) causal locus, (2) controllability, (3) stability, and (4) globality; (5) parent responsibility for the behavior and (6) affective and (7) behavioral responses which the parent might engage in following such a behavior by their child. In support of reliability and validity, Johnston (Johnston & Freeman, 1997) estimated internal consistencies by correlating responses to two examples of each behavior type. Correlations ranged from .10 to .82, with median correlation of .49.

Within the current study, analyses focused on attribution ratings of locus, controllability, stability, and globality. There were four items for each of the above attribution rating and per behavioral type (inattentive-overactive, oppositional/disobedient, prosocial/positive). An example scenario follows: "Your child enters the kitchen as you have finished sweeping the floor and getting the dirt in a pile to pick up. He/she doesn't wait for you to finish and heads straight to the fridge. As he/she rushes through the kitchen, the pile of dirt scatters across the floor." In the current study, alpha reliability coefficients were obtained and were adequate (coefficients ranged from .70 - .87, except for measures of locus which were lower than .70).

Recalled Incident Interview

Johnston's (see Johnston & Freeman, 1997) semi-structured interview was used to obtain parent attributional ratings of parent reported, actual child behavioral incidents recalled by parents. For this measure, the parent respondent was asked to recall two recent specific instances of impulsive-overactive, oppositional, and prosocial behaviors. A senior research assistant interview administered the interview following a standardized protocol whereby causal attributions were explained and example behaviors were provided. The parent was redirected to the example behaviors if he/she provided a behavior which was not clearly either impulsive-overactive, oppositional, or prosocial. After describing each recalled behavior, the parent rated (1) the intensity of the behavior; (2) causal locus, (3) controllability, (4) stability, (5) globality/generalizability, (6) parent responsibility for the behavior, parental (7) affective and (8) behavioral responses. In support of reliability and validity, Johnston (Johnston & Freeman, 1997) estimated internal consistencies by correlating responses to two examples of each behavior type.

Correlations ranged from .03 to .58, with median correlation of .32. Within the current study, analyses focused on attribution ratings of locus, controllability, stability, and globality. Two recalled incidents were obtained for each of three behavior types: inattentive-overactive, oppositional/disobedient, and prosocial/positive. Reliability ranged from .33 - .70, notably variable.

The Interactions Questionnaire

The Interactions Questionnaire (Hoza & Pelham, 1995) was used for the testing of an exploratory hypothesis (exploratory hypothesis 2). The Interactions Questionnaire was developed by Hoza and Pelham in order to assess parents' attributions pertaining to their children's compliance and noncompliance. The measure consists of 6 brief hypothetical but common scenarios of child non-compliance or compliance each followed by ten questions parents rate on a 10-point scale (1=really true to 10=not true at all). Note that unlike the Written Analogue Questionnaire (WAQ) and Recalled Incident Interview (RII) which separate Inattentive-Overactive from Oppositional/Disobedient child behaviors, within the Hoza Interaction Questionnaire behaviors are either compliance or non-compliance. In the original Hoza Interactions measure, attribution dimensions were assessed and scored separately for compliance and non-compliance. Three compliance and three non-compliance scenarios were administered; however, due to time constraints in the current study, data were only collected for 6 attribution dimensions. That is, parents rated each of the 6 scenarios (3 per each behavior type) on the six most relevant attribution dimensions rather than on the 10 attribution dimensions assessed in the complete, original Hoza Interactions measure. Thus, in the current study, parents rated the extent to which child behavior was due to: (1) child mood, (2) child

effort to please parent, (3) child ability to control him/herself, (4) parent effort to control child's behavior, (5) parent general quality as parent ("good parent") and (6) parent ability to obtain child behavioral compliance. These subscales were selected due to their similarity to attribution dimensions reviewed and targeted for study. Hoza et al. (2000) reported coefficient alphas for the lack of effort ($\alpha=.87$) and child mood ($\alpha=.85$) subscales.

Although six attribution dimensions were included in the data collection effort, only three of the attribution subscales were proposed for use: (1) parent effort to control child's behavior, (2) parent general quality as parent ("good parent") and (3) parent ability to obtain child behavioral compliance. These subscales were used as attempt to test exploratory hypothesis 2. Reliabilities for the first two subscales were low ($\alpha=.60$ and $.58$), corresponding to the factor analytic results presented in the section on data reduction. These two subscales were not used for testing main hypotheses. The third subscale had adequate reliability ($\alpha=.90$).

Parent Role Adjustment

Satisfaction with Parenting Performance Scale

The Satisfaction with Parenting Performance subscale of the Parenting Satisfaction Scale (Guidubaldi & Cleminshaw, 1994) contains fifteen items, (rated on a 4-point scale, 1=Strongly Agree, 2=Agree, 3=Disagree, 4=Strongly Disagree). Items include: "I wish I did not become impatient so quickly with my child" and "I wish I were a better parent and could do a better job of parenting." (Note: these two items are reversed scored so that higher score equates more satisfaction). The internal consistency

reliability reported in the manual is satisfactory ($r=.82$). Within the current sample, reliability was also satisfactory ($\alpha=.85$ for maternal self-ratings, $\alpha=.86$ for paternal self-ratings).

The Parenting Stress Index- Short Form

The Parenting Stress Index – Short Form (PSI; Abidin, 1995) consists of 36 items, to be rated on a 5-point scale (strongly agree to strongly disagree). Example items include: "I often have the feeling that I cannot handle things well," "I find myself giving up more of my life to meet my children's needs than I ever expected."

The PSI Total Stress score was chosen for use in the current study. Reliabilities for the PSI Total Stress score within current sample were satisfactory ($\alpha=.93$ for mother self-rating, $\alpha=.90$ for father self-ratings). Additional information is included in section on data reduction.

Measure of Child Attributions

Written analogue questionnaire.

A child version of Johnston's Written Analogue Questionnaire was adapted by the author from the parent version described below. Adaptations were aimed at simplifying language and scaling complexity so that it could be understood by children as young as 7 years old. The format was broken into two parts where children first made a dichotomous decisions about each attribution (i.e., "something about you" or "something not about you") and then were asked to rate dimensionally (i.e., "A lot about you", "Mostly about you", "some about you"). A picture accompanied the scenarios that were read in an engaging way to the child. In order to keep the child engaged in the task, three

specific items were personalized by asking the child specific questions and inserting his or her response into the behavioral scenario. For example, for an item involving a child looking for his/her sports equipment, the child was first asked what if any sports, he/she played. That sport with appropriate equipment was then inserted into the scenario. Children were asked to imagine that they had engaged in the behavior and then rate the attribution dimensions. The written analogue questionnaire was administered following a standardized protocol. Because the current author created the child version as an adaptation of Johnston's adult measure, there is no prior reliability information on this measure. Notably, this is an exploratory, pilot sub-study.

Additional Child Variables

Reading Disability (RD).

The Wechsler Intelligence Scales for Children-III (WISC-III; Wechsler, 1991) short form and Wechsler Individual Achievement Test (WIAT; Wechsler, 1992) screener were administered. Two criteria were required for meeting criteria for a Reading Disorder: (1) standardized reading score on WIAT reading < 85 and (2) IQ (ability) - achievement discrepancy equal to or greater than one standard deviation (15 points).

ODD or CD Diagnoses.

Diagnosis of Oppositional Defiant Disorder and diagnosis of Conduct Disorder were calculated from the Diagnostic Interview Schedule for Children (DISC-IV). If children met criteria based on mothers' DISC interview, they were assigned a diagnosis of ODD or CD as appropriate. Note that the DISC interview has parents rate each of the

behaviors under ODD and CD per the DSM-IV as well as onset, severity, and impairment into functioning so that the interview provided the ability to make a diagnoses based on the DSM-IV criteria for ODD and CD.

Data Reduction

Multiple instruments were used to measure various constructs. In order to simplify data and most reliably measure the intended constructs, composite scores were created when justified. Factor analyses were conducted in order to confirm factor structures for measures that have been relatively newly developed (i.e., attribution measures). Inter-correlations were conducted when appropriate in order to further test whether composites were warranted/appropriate/justified.

Measures pertaining to ratings of child behavior are discussed first, followed by maternal attribution measures, maternal role adjustment measures, and child attribution measures. Because the study focus is on maternal attributions and adjustment, results for mothers are presented first (throughout remainder of document). Child attribution results are most exploratory and are presented last. Teacher data (n=114) was used for additional testing of results when appropriate.

Data Reduction of Adult Reported Ratings of Child Behavior

Within-reporter composites were created for the three core child behavior domains (inattention, hyperactivity, and disruptive behavior). Teacher and mother ratings were not combined for dimensional analyses. Maternal ratings of child behaviors may certainly be viewed as measure of maternal –perception or experience of severity of

child behavior problems. Interpretations are limited by this constraint as discussed later. When relevant, results were cross-checked with teacher ratings which may be viewed as a cross validation of results as well as a check on cross situation extent of observed association.

For mother, father, and teacher ratings of child behavior, confirmatory factor analyses were conducted separately for each rater in order to confirm a three-factor solution (inattention, hyperactivity, opposition/aggression) for each rating of child behaviors. The three-factor confirmatory analyses resulted in a factor for child (a) inattention, (b) hyperactivity and (c) other disruptive behaviors. The three-factor solutions were confirmed for each rater. As the measures have established, normed factors, principal components confirmation factor analyses was conducted with the established factors to validate the use of three child behavior factors. Unsurprisingly, the three components were confirmed across measure as expected (that is into the three components noted above) with eigenvalues all greater than 1.

For each rater, a composite score was then created for each component factor. The Inattention factor was created with the average ratings on ADHD Rating Scale inattention subscale and BASC Inattention scale. The hyperactivity factor was created by averaging the scores on the ADHD Rating Scale Hyperactivity subscale, Conners' Hyperactivity scale, and BASC Hyperactivity Scale. The disruptive Disobedient/ Oppositional behaviors factor consisted of the average of the rater's ratings on the Conners' Oppositional subscale, BASC Conduct Problems subscale, and BASC Aggression subscale. Each of the composite scores were created for each rater (mother, father, teacher) and yielded adequate reliabilities.

Composites for Maternal Ratings of Child Behaviors.

Composites of mother ratings across measures yielded composites with good internal reliabilities (inattention $\alpha=.91$, hyperactive $\alpha=.95$, and oppositional $\alpha=.90$). As expected from the literature, oppositional defiant/aggressive behavior and hyperactivity were highly correlated in the sample ($r=.83$, $p<.001$; see also Table 2).

Table 2: Correlations between three-factor solution for mother ratings, (reliabilities on diagonal)

	Inattention	Hyperactivity	ODD
Inattention	.91		
Hyperactivity	.69***	.95	
ODD	.57***	.83***	.90

*** $p<.001$

The second step in data reduction was to look at inter-correlations among measures again to confirm that composites were justified. Within rater, inter-correlations supported the creation of composites by behavior type. For each behavior type (inattention, hyperactivity, and oppositional/defiance) correlations were greater than .80 (all $p<.001$; see Table 3). Notably, cross construct correlations were also high (ranging from .49-.69) but somewhat less than .80. Thus, the different behavior domains are arguably partially separate although highly correlated. These correlations along with the principal components confirmatory factor analyses supported the retention of the three behavioral factors, albeit with a caution as to their overlap.

Table 3: Inter-Correlations among child behavior measure subscales – mother ratings

	ARS Inattentio n	ARS Hyperacti vity	BASC Inattentio n	BASC Hyperacti vity	BASC Aggressio n	BASC Conduct Problems	Conners Oppositio nal	Conners Hyperacti ve	Conners ADHD Index
ARS Inattentio n	1.0								
ARS Hyperacti vity	.73***	1.0							
BASC Inattentio n	.88***	.61***	1.0						
BASC Hyperacti vity	.63***	.88***	.59***	1.0					
BASC Aggressio n	.55***	.74***	.51***	.81***	1.0				
BASC Conduct	.49***	.66***	.48***	.71***	.78***	1.0			
Conners Oppositio nal	.65***	.78***	.60***	.80***	.82***	.75***	1.0		
Conners Hyperacti ve	.69***	.91***	.62***	.88***	.75***	.67***	.83***	1.0	
Conners ADHD Index	.92***	.76***	.88***	.70***	.61***	.55***	.69***	.77***	1.0

ARS=ADHD rating scale

BASC=Behavioral Rating Scale for Children

***p<.001, **p<.01, *p<.05, +p<.1

Teachers' Ratings of Child Behaviors.

Confirmatory factor analysis was used to confirm a three-factor solution for teacher data. As with mother and father data, factor composites were created for Hyperactivity, Inattention, and Disruptive behaviors. Reliabilities were satisfactory for all three composites (See Table 4). The reliabilities for teacher ratings of child Oppositional/Disobedient (alpha=.91) and hyperactivity (alpha=.93) were high and reliability for composite teacher rating of child inattention (alpha=.88) was satisfactory.

Table 4 Correlations for teacher behavior rating composites, 3-factor solution (reliabilities on diagonal)

	Inattention	Hyperactivity	ODD
Inattention	.88		
Hyperactivity	.79***	.93	
ODD	.77***	.86***	.91

***p<.001

Correlations Between Maternal and Teacher Data.

The correlations between mother and teacher composite ratings of child behavior are shown here (Table 5). Mother and teacher ratings were highly correlated.

Table 5 Correlations between mom and teacher ratings for three-factor solution

	Mom rated Inattn	Mom rated Hyp	Mom rated ODD	Teacher rated Inattn	Teacher Rated Hyp	Teacher Rated ODD
Mom rated Inattn	1.0					
Mom rated Hyp	.69***	1.0				
Mom rated ODD	.57***	.83***	1.0			
Teacher rated Inattn	.70***	.48***	.38***	1.0		
Teacher Rated Hyp	.52***	.62***	.54***	.65***	1.0	
Teacher Rated ODD	.38***	.58***	.61***	.45***	.73***	1.0

***p<.001

Data Reduction of Maternal Attribution Data

For each of Johnston's measures (Written Analogue Questionnaire, WAQ, and the Recalled Incident Interview, RII), preliminary analyses were conducted to determine factor structure. The steps were identical for each measure; however, for clarity, each measure is discussed separately. For each measure, data reduction was conducted first for mother data and then father data. Because these attribution measures are not yet well established or validated, exploratory factor analyses used run to guide the creation of subscales.

Written Analogue Questionnaire (WAQ)

Factor analyses were conducted in order to determine the factor structure within current dataset. Within the WAQ, three behavior types were rated (Inattentive-Overactive, Disobedient/Oppositional, and Prosocial/Positive). Four scenarios of each behavior type were administered. Finally, four primary attribution domains were included: locus, controllability, stability and globality. Thus, for each behavior type (3), there were four scenarios (4) and four attribution ratings (4), resulting in 16 items per behavior type (48 items total)³. Oblimin rotation with Kaiser Normalization was used.

The literature suggests that attributions differ for different types of behaviors, such as positive versus negative. Thus, factor analyses were conducted separately by behavior type.

The factor solutions by behavior type are shown in Tables 6, 7, and 8. As shown in Table 6, a four-factor solution emerged for attributions about Inattentive-Overactive behaviors. Items with cross-loadings greater than .25 were deleted in order to obtain a clean factor solution⁴. (Dropped items are not shown).

³ Note: a few additional items were asked about each behavior type and scenario; however, those results are presented after considering the reduction of the four attribution domains of primary interest in the current study.

⁴ Defined as factor solution with minimal cross-loadings greater than .25.

Table 6 Factor loadings of Maternal Attributions for Inattentive /Overactive behaviors via WAQ Questionnaire Scenarios

Factors	Individual Variable Labels	Factor 1	Factor 2	Factor 3	Factor 4
Globality (Eigenvalue=3.23)					
	Scenario a globality	.80	-.10	.19	
	Scenario d globality	.77			
	Scenario c globality	.71		-.14	
	Scenario b globality	.67	.13		
Locus (Eigenvalue=2.6)					
	Scenario a locus	-.11	.89	-.20	
	Scenario d locus		.71	.22	
	Scenario b locus	.20	.62	.16	
Controllability (Eigenvalue=1.2)					
	Scenario c controllability	-.11		.90	
	Scenario d controllability		.13	.80	-.14
Stability (Eigenvalue=1.2)					
	Scenario c stability				.84
	Scenario a stability	.12			.79
	Scenario d stability	-.15			.70

For Oppositional/Disobedient behaviors, no clean factor solution⁵ emerged until the globality factor was dropped. After dropping items with multiple cross-loadings, stability and globality loaded as one factor (see Table 7).

⁵ Defined as factor solution with minimal cross-loadings greater than .25.

Table 7 Factor Solution of Maternal Attributions for Oppositional / Disobedient behaviors via WAQ Questionnaire Scenarios

Factors	Individual Variable Labels	Factor 1	Factor 2	Factor 3
Stability/Globality (Eigenvalue=3.3)				
	Scenario h stability	.75	-.32	
	Scenario f stability	.73		
	Scenario g globality	.69		
	Scenario h globality	.67		
	Scenario e stability	.66		-.30
	Scenario f globality	.63	.26	
Locus (Eigenvalue=2.6)				
	Scenario e locus		.83	
	Scenario f locus		.72	
	Scenario g locus		.65	
Controllability (Eigenvalue=1.2)				
	Scenario e controllability			.85
	Scenario h controllability			.79
	Scenario f controllability			.76

Notably, globality and stability have been viewed as one factor in prior studies with other measures of attributions (Bunce & Peterson, 1997; Peterson, Seligman, Yurko, Martin, & Friedman, 1998) as well as by Geller and Johnston (1995) on the WAQ and RII. However, because globality and stability emerged as distinct factors for the Inattentive-Overactive and Prosocial/Positive behavior types, the decision was made to drop globality for Oppositional/Disobedient behavior type rather than combining it with stability. Thus, rather than combining globality and stability for the WAQ OPP/D (Oppositional/Disobedient) attributions, globality was dropped. The final factor solution with remaining cross-loadings is shown in Table 8.

Table 8 Final Factor Solution of Maternal Attributions for Oppositional / Disobedient behaviors via WAQ Questionnaire Scenarios (globality items dropped)

Factors	Individual Variable Labels	Factor 1	Factor 2	Factor 3
Controllability				
	Scenario f controllability	.81		
	Scenario e controllability	.81		
	Scenario h controllability	.75		
	Scenario g controllability	.69	.12	
Stability				
	Scenario f stability		.85	
	Scenario h stability		.81	.21
	Scenario e stability		.80	
	Scenario g stability	-.11	.77	
Locus				
	Scenario e locus			-.80
	Scenario g locus		.11	-.68
	Scenario f locus	.20		-.67
	Scenario h locus		-.15	-.60

For mother attributions about Positive behaviors, a clean four-factor solution emerged as shown in Table 8; only one item was dropped due to cross-loadings greater than .25.

Table 9 Factor loadings of Mom Attributions for Positive/Prosocial Behaviors via WAQ Questionnaire Scenarios

Factors	Individual Variable labels	Factor 1	Factor 2	Factor 3	Factor 4
Stability					
	Scenario j	.86			
	Scenario k	.85			
	Scenario l	.83			
	Scenario i	.64	.17	-.15	
Controllability					
	Scenario l		.87	.15	
	Scenario j		.84	.16	
	Scenario i	-.15	.81	-.18	
	Scenario k		.79		
Locus					
	Scenario k	.11		.77	
	Scenario j	.13		.71	
	Scenario i	-.15		.70	
Globality					
	Scenario k			.15	-.86
	Scenario j				-.83
	Scenario l			.17	-.80
	Scenario i	.13	.25	-.14	-.67

Creation of Subscales and Reliabilities.

Subscales were created by averaging each rating of attribution domain across scenarios. Subscales were created for Inattentive-Overactive locus, control, stability, and globality; Oppositional/Disobedient locus, control, and stability, and Positive behavior locus, control, stability, and globality.

As shown in Table 10, the WAQ attribution subscales generally had satisfactory reliabilities. Locus had a lower than preferred reliability across behavior domains (alpha=.66 for IO and Oppositional behavior type, alpha=.65 for positive behavior type). All other reliabilities were greater than .70, which are still lower than desired but more adequate.

Table 10 Intercorrelations among Mother rated WAQ factors and data reliabilities (on diagonal) of composites

	IO Locus	IO control	IO stability	IO globality	OPP/D locus	OPP/D control	OPP/D stability	PRO /Positive locus	Positive control	Positive stability	Positive globality
IO Locus	.66										
IO control	.24**	.75									
IO stability	.00	-.28**	.70								
IO globality	.24**	-.13	.42***	.75							
OPP/D locus	.47***	.31***	-.08	.12	.66						
OPP/D control	.19*	.69***	-.29***	-.05	.42***	.77					
OPP/D stability	-.10	-.27**	.68***	.34***	-.09	-.28**	.83				
Positive locus	.17	.06	-.11	-.02	.30***	.11	-.10	.65			
Positive Control	.05	.47***	-.20*	-.03	.25**	.55***	-.21*	.28**	.87		
Positive Stability	.01	.23*	-.34***	-.29***	.09	.21**	-.45***	.27**	.35***	.84	
Positive Globality	.08	.25**	-.43***	-.23*	.17+	.30***	-.56***	.39***	.35***	.55***	.86

***p<.001, **p<.01, *p<.05, +p<0.1

Inter-correlations revealed that type of attribution dimensions (i.e., locus, control, stability, globality) was significantly related for Inattentive/Overactive and Oppositional/Disobedient behaviors and that these correlations were medium to large in magnitude. This supported the validity of the scales.

In summary, the resulting factors for mother WAQ attributional domains for testing of hypotheses are noted herein. For Inattentive-Overactive (IO) and Positive/Prosocial (PRO), the result was a four-factor solution: (1) locus, (2) controllability, (3) stability, and (4) globality. For Oppositional/Disobedient behavior type, globality dropped and a three-factor solution: (1) locus, (2) controllability, and (3) stability were used. Reliabilities were adequate ($\alpha > .70$) for most subscales (except for locus, $\alpha < .70$). Reliabilities for Oppositional/Disobedient stability rating and Prosocial/Positive globality, stability, and controllability were within desirable range ($\alpha > .80$).

Recalled Incident Interview (RII) Data Reduction.

As with the WAQ, an initial factor analyses with all items included did not reveal usable factors. The factor structure was not clean, with multiple overlapping items correlating greater than .25 (as well as no clear break in the scree plot; KMO Measure of Sampling Adequacy=.66). Therefore, as was done with the WAQ, factor analyses were conducted by behavior domain.

For the recalled incident interview, only two recalled incidents were recalled per behavior type (in contrast to four scenarios per behavior type in the WAQ). Thus, for each behavior type (3), there were two recalled incidents (2) and the four attribution domains (4) under consideration, resulting in 8 items per behavior type (total of 24 items).

For Inattentive-Overactive behavior type, a clean factor solution emerged during the first run (see Table 11).

Table 11 Factor Solution of Maternal Attributions for Inattentive/Overactive behaviors via RII Questionnaire Scenarios

Factors	Individual Variable Labels	Factor 1	Factor 2	Factor 3	Factor 4
Stability (Eigenvalue=2.2)					
	Recalled Behavior 1 stability	.90			
	Behavior 2 stability	.84			-.10
Locus (Eigenvalue=1.5)					
	Recalled Behavior 2 globality		.88		
	Behavior 1 globality	.12	.78	.20	
Controllability (Eigenvalue=1.2)					
	Recalled Behavior 1 controllability			.88	
	Behavior 2 controllability			.87	
Globality (Eigenvalue=1.0)					
	Recalled Behavior 2 locus		-.18		-.90
	Behavior 1 locus		.41		-.57

For Oppositional/Disobedient behavior type, the initial factor analyses resulted in a 3-factor solution with globality items splitting and collapsing with stability and controllability (See Table 12).

Table 12 Factor Solution of Maternal Attributions for Oppositional/Disobedient behaviors via RII Questionnaire Scenarios

Factors	Individual Variable Labels	Factor 1	Factor 2	Factor 3
Stability/Globality (eigenvalue=2.3)				
Recalled Behavior 2 stability		.84		.11
Behavior 1 stability		.77	-.22	
Behavior 2 globality		.56	.45	-.22
Locus (eigenvalue=1.5)				
Recalled Behavior 2 locus		-.23	.71	-.12
Behavior 1 locus		-.23	.66	.30
Controllability (eigenvalue=1.1)				
Recalled Behavior 1 controllability		.11		.88
Behavior 1 globality		.21	.43	-.55
Behavior 2 controllability		.30	.32	.45

For consistency with other literature and behavior types, globality items were dropped, resulting in a 3-factor solution with subscales in acceptable factor structure and ties to literature. Notably, when globality items were dropped (as was done with the WAQ), a clean 3-factor solution remained (see Table 13).

Table 13 Factor Solution of Maternal Attributions for Oppositional/Disobedient behaviors via RII Questionnaire Scenarios (globality items dropped)

Factors	Individual Variable Labels	Factor 1	Factor 2	Factor 3
Stability (eigenvalue=1.8)				
Recalled Behavior 2 stability		-.85	.20	
Behavior 1 stability		-.81	-.19	
Locus (eigenvalue=1.3)				
Recalled Behavior 2 locus		.16	.84	-.17
Behavior 1 locus		-.22	.73	.20
Controllability (eigenvalue=1.1)				
Recalled Behavior 1 controllability				.89
Behavior 2 controllability		.24		.68

For positive/prosocial behaviors, initial analysis resulted in a three-factor solution; however, rather than attribution dimensions emerging as factors, three of the attribution domains (locus, stability, and globality) clustered by behavioral example (recalled behavior 1 and recalled behavior 2) rather than by attribution (see Table 14). That is,

those three attribution domains did not separate but rather clustered together for each recalled behavioral incident. Only for the attribution domain of controllability did controllability items cluster together. Therefore, only the controllability attribution domain was used for analyses when concerning Recalled Incident Interview Prosocial Behaviors. Factor analytic results for Recalled Incident Prosocial Behaviors are shown in Table 14.

Table 14 Factor Solution of Maternal Attributions for Positive/Prosocial behaviors via RII Questionnaire Scenarios

Factors	Individual Variable Labels	Factor 1	Factor 2	Factor 3
Factor 1 (eigenvalue=2.4)				
Recalled Behavior number 2 stability		.85		-.10
Behavior 2 locus		.72		
Behavior 2 globality		.70		.13
Factor 2 (eigenvalue=1.5)				
Recalled Behavior number 1 globality			.78	
Behavior 1 stability			.75	
Behavior 1 locus			.69	
Factor 3 (eigenvalue=1.0)				
Controllability				
Scenario 1 controllability		-.14	.11	.90
Scenario 2 controllability		.24	-.14	.65

For completeness, inter-correlations among the attribution subscales are presented in Table 15 along with reliabilities. The subscales for the RII generally had poor reliabilities ($\alpha < .70$). As with the WAQ, attributions about locus generally had lowest reliabilities ($\alpha = .33$ for IO locus, $\alpha = .42$ for OPP locus). IO stability had marginally adequate reliability ($\alpha = .70$).

Table 15 Reliabilities of (on diagonal) and intercorrelations among mother rated RII factor composites

	IO locus	IO control	IO stability	IO globality	OPP/Dis locus	OPP/D control	OPP/D stability	POS/Pro control
IO locus	.33							
IO control	-.09	.68						
IO stability	.13	-.18*	.70					
IO globality	.32***	-.02	.12	.65				
OPP/D locus	.28**	.09	.06	.29***	.42			
OPP/D control	-.07	.49***	-.18*	-.17+	.03	.51		
OPP/D stability	-.04	-.04	.49***	.17	-.07	-.28**	.64	
POS/Pro control	-.09	.24**	-.04	.00	.08	.42***	.04	.45

***p<.001, **p<.01, *p<.05, +p<0.1

Surprisingly, IO Stability and Globality were not highly related, nor were controllability and locus (for IO or OPP behaviors).

Attribution ratings which were highly correlated included: IO control and OPP control ($r=.49$, $p<.001$) and IO stability and OPP stability ($r=.49$, $p<.001$) suggesting that control and stability attributions are similar for IO and OPP ratings but that the 3 or 4 factor solution better fit the current data compared to the 2 factor solution used in some of Johnston's prior work (Geller & Johnston, 1995).

In summary, the Recalled Incident Interview factors were less clean compared to factors resulting from the Written Analogue Questionnaire. For Inattentive-Overactive behavior type, a clean four-factor solution emerged, allowing creation of scores for each type of attribution (locus, controllability, stability, and globality). For Oppositional/Disobedient behavior type, globality did not emerge as a useable factor so factors are available only for locus, controllability, and stability. For the Positive/Prosocial behavior type, the factors were grouped largely by the recalled

behavioral incident given by mothers; the only factor that emerged for attribution domain was controllability.

The reliabilities of the RII subscales were much lower when compared to the reliabilities obtained with the WAQ. The RII reliabilities were likely reduced by the fewer number of items (two opposed to four used in WAQ) as well as by the greater variability per scenario. Recall that in the RII, parents were asked to give an example behavior in which the child had actually engaged. The severity of the behaviors varied considerably as some of the children exhibited symptoms of IO significant enough for a diagnosis of ADHD whereas others likely exhibited these behaviors within average or “non-disordered” level of severity, typical of most children during this stage of development. Thus, the lower reliability may be accounted for by the structure of the measure.

Table 16 Correlations between WAQ and RII subscales

	WAQ IO locus	WAQ IO control	WAQ IO stability	WAQ IO globality	WAQ OPP/D locus	WAQ OPP/D control	WAQ OPP/D stability	WAQ Pro locus	WAQ Pro control	WAQ Pro stability	WAQ Pro globality
RII IO locus	.21*	-.01	.01	.16+	.04	-.06	-.07	.04	-.06	-.07	-.09
RII IO control	.07	.56***	-.15	-.06	.18*	.48***	-.10	.18*	.48***	-.10	.02
RII IO stability	-.12	0.10	.50***	.21*	.004	-.14	.49***	.004	-.14	.49***	.21*
RII IO globality	.08	-.06	.26**	.43***	.02	-.02	.33***	.02	-.01	.33***	.41***
RII OPP/D locus	.25**	.05	.11	.11	.09	.03	.06	.09	.03	.06	.06
RII OPP/D control	.12	.51***	-.23**	-.01	.25**	.52***	-.12	.25**	.52***	-.12	-.05
RII OPP/D stability	-.11	-.01	.46***	.25**	-.06	-.14	.47***	-.06	-.14	.47***	.34***
RII Pro control	.002	.32***	-.03	-.03	.19*	.29**	-.03	.20*	.29**	-.03	.05

***p<.001, **p<.01, *p<.05, +p<.1

Data Reduction for Measures of Maternal Role Adjustment

Parent Satisfaction Survey and Parenting Stress Index Scales.

The Parenting Satisfaction Survey Satisfaction with Parenting Performance was considered as an outcome variable as was the PSI Parent Distress Subscale. Because normative data is available for the PSI-SF Total score, it was considered as a possible outcome in place of the PSI Parent Distress subscale.

As shown in Table 17, reliabilities within current study for parent role adjustment (used as outcome measure) were satisfactory. The reliability for the PSI-SF Total Stress score (alpha-.93) was expectedly (due to larger number of items used in total score) higher than the reliability for the PSI Parent Distress form (alpha=.85).

Table 17 Reliabilities and inter-scale correlation matrix for maternal role adjustment

	PSS Satisfaction with parenting performance	PSI Parent Distress	PSI-SF Total Stress
PSS Satisfaction with parenting performance	.85		
PSI Parent Distress	-.48***	.85	
PSI-SF Total Stress	-.50***	.79***	.93

***p<.001

Both the PSI-SF Total Stress Score and PSI Parent Distress score were similarly related to PSS Satisfaction with Parenting Performance ($r = -.48$ and $r = -.50$, respectively), they were considered comparable usefulness in current study. Due to its usefulness for comparison with the literature, the PSI-SF Total Stress score was used instead of the PSI Parent Distress score.

Thus, the *PSI-SF Total Stress Score and PSS Satisfaction with parenting performance* were retained for analysis.

Additional Attribution Measures

Attribution Items Pertaining to Parent Responsibility and Control

Additional Attribution Items of Interest (needed for Exploratory Analysis ⁶). In prior studies, attributions about child controllability have been found as key to parental adjustment (Dix & Grusec, 1985), the extent to which parents feel responsible for their child's behavior and the extent to which they feel both responsible and able (or unable) to control their child's behavior might be important in their adjustment. An additional exploratory analysis is that parental experience of responsibility might interact with perceived ability to control child's behavior might predict parental role adjustment.

Two items were added to the WAQ in order to assess the extent to which parents reported feeling responsible and able or unable to control their child's behavior. Factor analysis of these two items (asked four times per each of the three behavior types, except Prosocial for which only parental responsibility was asked) revealed that they form as two separate items. The factor analytic results are shown in Tables 18 and 19. Again, the bend in the scree plot and eigenvalues greater than 1 along with correspondence to literature were used to guide final factor solution selection.

⁶ Note: parent exploratory analyses conducted for mother data only

Table 18 Maternal WAQ Attributions about parent role in child behavior factors for Inattentive-Overactive Behaviors

Factors	Individual Variable Labels	Factor 1	Factor 2
Parental ability to control child behavior (eigenvalue=2.9)			
	Scenario a controllability	.87	
	Scenario b controllability	.86	
	Scenario c controllability	.83	
	Scenario d controllability	.82	
Parent responsibility (eigenvalue=2.5)			
	Scenario b responsibility		.86
	Scenario c responsibility		.84
	Scenario e responsibility		.78
	Scenario a responsibility		.70

Table 19 Mother WAQ Attributions about parent role in child behavior factors for Oppositional/Defiant child behaviors

Factors	Individual Variable Labels	Factor 1	Factor 2
Parental ability to control child behavior (Eigenvalue=2.7)			
	Scenario a controllability	.87	
	Scenario b controllability	.86	-.15
	Scenario c controllability	.83	
	Scenario d controllability	.82	
Parent responsibility (Eigenvalue=2.1)			
	Scenario b responsibility		.86
	Scenario c responsibility	.25	.84
	Scenario e responsibility	-.20	.78
	Scenario a responsibility		.70

Reliabilities were good for all mothers' attributions pertaining to her own role in child's behavior, except for attribution about control of child Oppositional/Disobedient behavior ($\alpha=.67$; see Table 20 for all alpha coefficients).

Table 20 Reliabilities for mothers' WAQ attributions pertaining to her role in child's behavior, by behavior type.

Child behavior type	Maternal responsibility	Maternal control
Inattentive-Overactive	.80	.87
Oppositional/Disobedient	.83	.67
Prosocial/ Positive	.93	NA

Thus, these five additional variables were deemed adequate for exploratory analyses, except for attribution about control of child Oppositional/Disobedient behavior ($\alpha=.67$).

RII Attribution Items Pertaining to Parent Responsibility and Control

The parent responsibility and control items were also added to the Recalled Incident Interview.

Table 21 Maternal RII Attributions about parent role in child behavior factors for Inattentive-Overactive Behaviors

Factors	Individual Variable Labels	Factor 1	Factor 2
Parental ability to control child behavior (eigenvalue=1.6)			
	Behavior 1 controllability	.90	
	Behavior 2 controllability	.87	
Parent responsibility (eigenvalue=1.4)			
	Behavior 2 responsibility		.96
	Behavior 1 responsibility		.76

Table 22 Maternal RII Attributions about parent role in child behavior factors for Oppositional/Defiant child behaviors

Factors	Individual Variable Labels	Factor 1	Factor 2
Parental ability to control child behavior (eigenvalue=1.9)			
	Behavior 2 controllability	.88	
	Behavior 1 controllability	.88	
Parent responsibility (eigenvalue=1.7)			
	Behavior 2 responsibility		.86
	Behavior 1 responsibility		.85

For maternal attributions about control and responsibility for child positive/prosocial behaviors, only one factor was found.

Reliability of the RII measures of maternal control and responsibility were quite low (α 's ranging from .48 to .72; See Table 23). Due to the unsatisfactory reliabilities obtained on measures of maternal control and responsibility factors using the RII, this measure was not used to test exploratory analysis 2.

Table 23 Reliabilities for mothers' RII attributions pertaining to her role in child's behavior, by behavior type.

Child behavior type	Maternal responsibility	Maternal control
Inattentive-Overactive	.48	.72
Oppositional/Disobedient	.63	.72
Prosocial/ Positive	.65	.64

Hoza Interactions Questionnaire

Three subscales were used for Exploratory Analysis 2: (1) **parent effort** to control child's behavior, (2) parent general **quality as parent** ("good parent") and (3) parent **ability to obtain child behavioral compliance**. A score was obtained for each of these subscales for child compliance and for child non-compliance. The Hoza consisted of six scenarios (3 compliance and 3 non-compliance); thus, each subscale would be a composite of 3 items.

An initial factor analysis was conducted with all three potential subscale items per each of the behavioral scenarios (6 total, 3 of each type); thus, the initial factor analysis consisted of 18 items. This initial factor analysis resulted in a four-factor structure, separated by compliance and non-compliance for the first factor, which was a non-compliance factor composed of "good general parenting" and "parent ability to control child's behavior." The second factor was composed of "parent ability to control child's behavior" for compliance items only. The third factor combined items from compliance and non-compliance scenarios but all items were related to "parent making special effort to control child's behavior." The last factor combined compliance and non-compliance items related to "general good parenting." The factor structure is shown in Table 24.

[Footnote: for most measures, initial factor analysis did not yield a useable factor solution. Factor analyses were then conducted separately by behavior type. The initial

factor analysis of the Hoza interaction questionnaire yielded clear and useable results. Therefore, those factors were retained rather than factors separated by behavior type. Notably, for comparison to Hoza articles it may be useful to separate by behavior type; however, the analyses of interest differ from Hoza's studies and direct comparison would not be possible anyway].

Table 24 Factor structure for Hoza maternal attributions about own parenting and effort

Factors	Variable Labels	Factor 1	Factor 2	Factor 3	Factor 4
Non-compliance good parenting and ability to control child behavior (eigenvalue=6.0)					
	Scn 4 non-comp good	.89			
	Scn 4 non-comp good	.86			
	Scn 4 non-comp ability	.85			
	Scn 5 non-comp ability	.84			
	Scn 2 non-comp good	.72			
Compliance parent ability to control child Behavior (eigenvalue=3.0)					
	Scenario 3 comp good parenting		.89		
	Scenario 1 comp good parenting		.80		
	Scenario 6 compliance good parenting		.80		
Special effort to control child's behavior Non-compliance and compliance (eigenvalue=1.7)					
	Scenario 6 compliance special effort			.78	
	Scenario 5 non-compliance special effort			.73	
	Scenario 3 compliance special effort			.72	
	Scenario 1 compliance special effort			.64	
	Scenario 2 non-compliance special effort	.61		.38	
	Scenario 2 non-compliance special effort	-.33		.55	
Good general parenting (eigenvalue= 1.2)					
	Scenario 3 compliance good parenting			.32	-.73
	Scenario 6 compliance good parenting				-.72
	Scenario 2 non-compliance good parenting				-.71
	Scenario 1 compliance good parenting			.41	-.48

Reliabilities of Hoza subscales were satisfactory (see Table 25). The reliability of the first two subscales: non-compliance good parenting and compliance ability to control child had good reliabilities ($\alpha=.89$ and $.82$, respectively).

Table 25 Hoza four factor subscale reliabilities and inter-correlations.

	Non compliance good parenting	Compliance ability to control child	Compliance and non Special effort	General good parenting (comp and non)
Non compliance good parenting	.89			
Compliance ability to control child	-.01	.82		
Compliance and non Special effort	.27**	.21	.73	
General good parenting (comp and non)	.13	.53***	.28**	.78

Child Attribution Measures.

Child attributions were measured by an adapted version of Johnston's Written Analogue Questionnaire and an adapted version of Hoza's Interactions Questionnaire. During initial testing with these measures, it became evident that children under the age of 10 were having difficulty with the Written Analogue Questionnaire. Although the measure had been adapted, children appeared to have difficulty. Testers noted that children did not appear to understand some of the questions and did not appear to be engaged. It was uncertain whether their lack of understanding was due to lack of engagement or vice versa.

With three children (ages 7, 9, and 10), the researcher and an assistant worked on simplifying the structure of the measure, using a forced-choice followed by multiple choice format. Prior adaptation had been to ask the child to imagine him/herself as the child in the story and inserting the use of first person rather than third person (you versus he/she). An additional adaptation was to occasionally ask the child details about the story which might pertain personally to him or her. For example, for an item that the child was looking for a piece of lost sporting equipment. Our participants were first asked what

sports if any they played and that sport with that piece of equipment was inserted into the item. These changes appeared to increase the child's engagement in the task. A final change was to have pictures drawn by an artist to correspond with each item (only two items did not have corresponding pictures drawn due to an oversight of the author in communication with the artist). While we were able to collect the child measure from most children, due to time constraints not all measures were obtained from every child. Despite this, the sample size was quite good for the child attribution measures. One hundred and twenty children completed the Written Analogue Questionnaire (WAQ) and 108 children completed the child Hoza. Although the Hoza is a secondary measure (not primary for hypotheses), it is used as a way to provide some construct validity for the child WAQ that was created from the adult WAQ for this study and has not been used in prior studies.

Child Written Analogue Questionnaire

As explained earlier, the child analogue questionnaire was adapted from the adult measure and then adapted into a format which could be better used by younger (ages 6-9) as well as the older (ages 10-14) in the current study. The data thus yield continuous ratings from the children with the ability to use dichotomous ratings if the continuous data did not form useable scales. Analyses revealed a usable continuous variable similar to the adult version of the WAQ.

As with the adult attribution measures, when all items were included in a factor analysis, no useable factors emerged. Following procedures with parent measures, factor analyses were conducted by behavior type. Within the child WAQ, the first four

scenarios (A, B, C, D) were clearly about Inattentive-Overactive behaviors. Although intended as an Oppositional/Disobedient scenario, scenario E (not ending video game and coming to dinner when told) potentially confounded inattentive/distractible behaviors with oppositional. Scenario E was run in factor analysis with IO scenarios (A-D) and the Oppositional scenario; it did not change results for IO factors and clustered meaningfully with other OPP items so was kept with OPP ratings. Children rated behaviors on the four attribution domains. The internal/external domain was worded as “about you” or “not about you/about the situation.” The controllability domain used the wording “you could have stopped/done differently” versus “you could not have stopped/done differently.” The stability domain was worded: you “would do every time” (stable) versus you “would do differently all the time” (unstable). The globality domain was worded: “only at home” versus “home and everywhere.”

Child Ratings of Inattentive-Overactive Scenarios

Factor analysis yielded a six-factor solution with three usable factors.

Table 26 Factor analysis of child WAQ attribution ratings pertaining to Inattentive Overactive child behaviors

Factors	Labels	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Globality (eigenvalue=2.8)							
	Scenario D globality	.80	-.14	-.14	-.15		.11
	Scenario B globality	.78					
	Scenario C globality	.77	.20				
	Scenario A globality	.66	-.17	.10		.17	
Controllability (eigenvalue=2.3)							
	Scenario D control		-.81				-.14
	Scenario A control	-.14	-.79		-.15		.26
	Scenario B control		-.68			.11	
	Scenario C control	.21	-.57			-.19	-.15
Locus 1 (eigenvalue=1.7)							
	Scenario D locus			.87	.13	-.27	
	Scenario A locus	-.14		.60	-.15	.30	.21
	Scenario C locus			.43	-.35	.29	-.36
Locus 2 (eigenvalue=1.3)							
	Scenario B locus	.12			-.83		
	Scenario C stability	.13		.20	.65	.37	.25
Stability (eigenvalue=1.1)							
	Scenario D stability	.14			.18	.79	-.18
	Scenario B stability		.12	-.14		.73	.14
	Scenario A stability	.12					.91

The first two factors were not heavily cross-loaded with other items (only one item cross-loading onto the first two factors at greater than .25). Although the third factor was cross-loaded with other items, it was still retained. Unsurprisingly, in the final factor analysis, the first two factors held whereas the third factor was less clean (as shown in Table 26). It loaded onto a fourth factor until two of the cross-loading items were deleted.

Thus, a three-factor solution was retained, providing child ratings of globality, controllability and locus pertaining to Inattentive-Overactive behaviors. The three-factor solution retained is shown in Table 27.

Table 27 Factor analysis of child WAQ attribution ratings pertaining to Inattentive Overactive child behaviors

Factors	Individual Variable Labels	Factor 1	Factor 2	Factor 3
Globality (eigenvalue=2.4)				
	Scenario D globality	.79		
	Scenario B globality	.77	-.21	
	Scenario C globality	.76	.13	-.13
	Scenario A globality	.71	.12	.20
Controllability (eigenvalue=1.8)				
	Scenario D controllability		.84	
	Scenario A controllability	-.15	.75	.15
	Scenario C controllability	.17	.65	-.17
	Scenario B controllability	.11	.64	
Locus (eigenvalue=1.2)				
	Scenario A locus		-.10	.83
	Scenario D locus			.72

For child attributional ratings of Inattentive-Overactive behaviors, only globality and controllability had adequate reliabilities ($\alpha=.77$ and $.69$, respectively). The reliability of the locus ratings was unsatisfactory ($\alpha=.39$ for locus).

Child Ratings of Oppositional/Disobedient Scenarios

Only two scenarios pertained to Oppositional/Disobedient behaviors. An initial factor analysis yielded a four factor solution (see Table 28) with stability items cross loading with locus and controllability (greater than $.31$). The stability items were deleted and a usable three-factor solution emerged (see Table 29).

Table 28 Factor analysis of child WAQ attribution ratings pertaining to Oppositional/Disobedient child behaviors

Factors	Individual Variable Labels	Factor 1	Factor 2	Factor 3	Factor 4
Locus (eigenvalue=2.0)					
	Scenario F locus	.77			.14
	Scenario E stability	.65		-.31	.10
	Scenario E locus	.55	-.14	.13	
Globality (eigenvalue=1.2)					
	Scenario E globality		-.88	.14	
	Scenario F globality	.17	-.81		-.14
Controllability (eigenvalue=1.1)					
	Scenario E controllability		-.12	.85	.20
	Scenario F controllability	.42	.19	.57	-.35
Stability (eigenvalue=1.1)					
	Scenario F stability	.17		.12	.92

Table29 Factor analysis of child WAQ attribution ratings pertaining to Oppositional/Disobedient child behaviors

Factors	Individual Variable Labels	Factor 1	Factor 2	Factor 3
Locus (eigenvalue=1.9)				
	Scenario F locus	.83		
	Scenario E locus	.70	-.13	
Globality (eigenvalue=1.2)				
	Scenario E globality		-.88	
	Scenario F globality	.15	-.79	
Controllability (eigenvalue=1.0)				
	Scenario E controllability	-.19	-.17	.89
	Scenario F controllability	.38	.19	.62

Reliabilities were poor for locus and controllability (alphas=.49 and .36 respectively) and borderline for globality (alpha=.64). Only the globality factor reliability was adequate for retention as a factor.

Child Ratings of Positive/Prosocial Scenarios

The factor analysis of child attributional ratings of positive/prosocial behaviors yield three-factors. Globality and stability factors emerged as one factor with stability items cross loading (.41 with the locus factor). The stability items were deleted and a

clean three-factor solution (with no cross-loadings greater than .25) emerged (see Table 30).

Table 30 Factor analysis of child WAQ attribution ratings pertaining to Positive/Prosocial child behaviors

Factors	Individual Variable Labels	Factor 1	Factor 2	Factor 3
Globality (eigenvalue=2.6)				
	Scenario H globality	-.85	-.19	
	Scenario G globality	-.81	.19	-.13
Controllability (eigenvalue=1.6)				
	Scenario H controllability		.88	
	Scenario G controllability		.87	
Locus (eigenvalue=1.0)				
	Scenario G locus			.83
	Scenario H locus			.80

Reliability for controllability was adequate ($\alpha=.71$) but borderline for globality and locus ($\alpha=.56$ and $.52$, respectively).

As shown in Table 31, child attributional ratings of globality for Inattentive and Disobedient behaviors are significantly related. Controllability ratings are highly correlated across all three behavioral types. Globality was correlated for rating pertaining to IO and Opp behaviors.

Table 31 Inter-correlations among child WAQ attribution ratings, data reliabilities on the diagonal

	IO globality	IO locus	IO control	OPP/D globality	OPP/D locus	OPP/D control	POS/Pro globality	POS/Pro locus	POS/Pro control
IO globality	.77								
IO locus	.07	.39							
IO control	-.21*	.06	.69						
OPP/D globality	.69***	.01	-.26**	.64					
OPP/D locus	-.23*	-.16+	.19*	-.23*	.49				
OPP/D control	-.10	-.02	.40***	-.13	.22*	.36			
POS/Pro globality	.09	-.18+	-.24*	.16	.13	.23*	.56		
POS/Pro locus	-.30**	-.06	.06	-.18+	.23*	.21*	.27**	.52	
POS/Pro control	-.20*	-.06	.30**	-.18*	.11	.40***	.08	.20*	.71

***p<.001, **p<.01, *p<.05, +p<.1

Child HOZA

The Hoza measure contains six scenarios, three pertaining to compliant behaviors and three pertaining to non-compliant behaviors. Children were asked to rate five possible reasons why they might do the behavior described in each scenario. Ratings were made on a five-point scale (1=very true to 5=not true at all). The five “reasons” included: a) child mood, b) child effort or lack of effort, c) child ability or lack of ability to control self, d) maternal effort or lack of effort, and e) maternal ability or lack of ability to “get you (child) to obey her.”

A factor analysis with all 30 items did not converge into a usable pattern matrix. Following procedures throughout data reduction, factor analyses were conducted by behavior type (in this case, compliance versus non-compliance).

Behavioral Compliance

For compliant behavioral scenario, a five factor solution emerged but with heavy cross-loadings (see Table 32). Maternal effort and control cross-loaded as did child effort and control.

Table 32 Factor analysis of child Hoza attribution ratings pertaining to Compliant behaviors

Factors	Labels	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Child mood and effort (eigenvalue=4.6)						
	Scenario 6 child effort	.86				
	Scenario 6 child mood	.65	.13			-.30
	Scenario 3 child effort	.54		-.22	.13	-.21
Mother effort (eigenvalue=1.6)						
	Scenario 1 mom effort		.87	.10		
	Scenario 3 mom effort		.68	-.10		-.19
	Scenario 6 mom effort	.33	.47	-.41		
Mother control (eigenvalue=1.5)						
	Scenario 6 mom control		-.27	-.82		
	Scenario 3 mom control			-.81		
	Scenario 1 mom control	-.17	.21	-.64		
Child control (eigenvalue=1.2)						
	Scenario 3 child control				.88	
	Scenario 1 child control	-.11			.81	
	Scenario 6 child control	.51			.60	.25
Child mood and effort (eigenvalue=1.0)						
	Scenario 1 child mood	-.12				-.76
	Scenario 3 child mood	.14	.16			-.72
	Scenario 1 child effort	.29	-.13	-.13	.13	-.58

*cross loadings greater than .25 suppressed

When items which cross-loaded at greater than .25 were deleted, a three factor solution emerged but again items were heavily cross-loaded with only 3 items not cross-loaded greater than .25 (see Table 33).

Table 33 Three-factor solution of child Hoza attribution ratings pertaining to Compliant behaviors

Factors	Individual Variable Labels	Factor 1	Factor 2	Factor 3
Child control (eigenvalue=3.1)				
	Scenario 1 child control	.79		
	Scenario 3 child control	.79		-.16
	Scenario 1 mom effort	-.29	.80	
Unnamed (eigenvalue=1.4)				
	Scenario 3 mom effort		.68	-.23
	Scenario 3 child mood	.47	.56	
	Scenario 1 child mood	.33	.55	
Mother control and child effort (eigenvalue=1.2)				
	Scenario 3 mom control			-.80
	Scenario 1 mom control	-.16		-.71
	Scenario 3 child effort	.28	.10	-.65
	Scenario 6 child effort	.24		-.51

***cross loadings greater than .25 suppressed**

When additional cross-loaded items were deleted, a final solution (shown here in Table 34), consisting of maternal control and child control, emerged.

Table 34 Two-factor solution for child Hoza compliance items

Factors	Individual Variable Labels	Factor 1	Factor 2
Mother control (eigenvalue=2.1)			
	Scenario 1 mother control	.81	
	Scenario 3 mother control	.81	
	Scenario 3 mom effort	.56	
Child control (eigenvalue=1.2)			
	Scenario 1 child control		-.92
	Scenario 3 child control		-.87

***note: no items cross-loaded at greater than .25.**

Reliability was inadequate for child's attributions about maternal control (alpha=.55) but adequate for rating of own control (alpha for child control=.75). If the factor maternal control was created without the maternal effort item included, reliability increased significantly (alpha for mother control composed of two control items=.61). Child rating of self-control and child rating of maternal control of child's compliance

behavior were significantly correlated although the size of the correlation was relatively small ($r=.22$, $p<.05$).

Behavioral Non-Compliance

When analyzing items pertaining to child non-compliance, no factor solution emerged in less than 25 rotations. Four factors had eigenvalues greater than 1 but no pattern matrix emerged even when tried to force 4 factor solution. Thus, no factors were created for the child Hoza non-compliance items.

Summary Regarding Child Attribution Measures

The child WAQ factor analysis yielded usable factors with satisfactory reliabilities. Factors retained for analysis were: globality and controllability ratings for Inattentive-Overactive behaviors; globality rating for Disobedient behaviors, and controllability for Positive behaviors. The child Hoza measure only yielded one factor with satisfactory reliability: child rating of own ability to control behavior in relation to scenarios about behavioral compliance. Child's rating of mothers ability to control child's compliance had borderline but still usable reliability ($\alpha=.61$). It was not possible to obtain a factor structure for child ratings of non-compliance behaviors on the Hoza measure.

The child WAQ subscales are compared to the child Hoza through an examination of correlations (see Table 35). The two measures were not highly related; however, only a few subscales were found reliable. Even those subscales with acceptable reliability were not significantly related to child ratings of self-control. Despite the lack of relation

between the Hoza and WAQ scales, the intercorrelations of items within scales suggest consistency within measure. However, lack of consistency across the measures suggests the need for additional psychometric and validity tests for both measures. Unexpectedly, child rating of self-control on Hoza compliance scenario was negatively related to child rating of internal locus on WAQ positive behavior scenario.

Table 35 Correlations between child WAQ and Hoza ratings

WAQ subscales	Hoza child ratings of Child self-control of compliance behaviors	Hoza child ratings of Mother control of compliance behaviors
IO globality	.17+	-.13
IO locus	.01	.06
IO control	.01	-.13
OPP/D globality	.12	-.11
OPP/D locus	-.14	.15
OPP/D control	-.11	.05
POS/Pro globality	-.11	-.14
POS/Pro locus	-.22*	-.11
POS/Pro control	-.16	-.04

***p<.001, **p<.01, *p<.05, +p<0.1

Child WAQ controllability rating of IO behavior and child Hoza rating of controllability were deemed the two most reliable and useful factors for test of hypotheses. Child WAQ ratings of IO globality, OPP/Disobedient globality and control, and POS control subscales were retained as well due to their satisfactory reliabilities and/or use for comparison to Hoza measures. Despite the lack of correlations between the two measures, correlations were good within each attribution measure.

Note regarding the Creation of Covariate Variables

No data reduction was conducted for creation of the co-variable variables. As noted in method section, reading disability was created through comparison of WISC and WIAT scores. Diagnosis of Oppositional Defiant Disorder was based on the DISC interview.

Primary Hypotheses

Hypothesis 1: Maternal attributions and child ADHD

Hypothesis 1a. Maternal attributions about child behavior will differ based on actual child diagnosis (child diagnostic group). Because a diagnosis of ADHD given to a child was theorized to affect parental attitudes about one's child's behavior, mothers' attributions about child behaviors were examined in terms of group comparisons.

Prediction 1a. ADHD diagnosis assigned to child was expected to be associated with parent stable, global, uncontrollable, and internal attributions. That is, parents of children with ADHD were expected to endorse more stable-global, uncontrollable, and external attributions compared to attributions made by parents of children without disorders. A difference was expected on all four dimensions.

Hypothesis 1b. Maternal attributions about child behavior will differ based on mothers' beliefs as to whether or not her child has ADHD.

Prediction 1b. Parents' belief that the child's behavior warranted an ADHD diagnosis or that the child has undiagnosed ADHD was also expected to be associated with parent stable, global, uncontrollable, and external attributions about child disruptive behaviors. That is, parents who believed that their child has a diagnosis of ADHD or believed that their child had undiagnosed ADHD (whether or not our through our testing we discovered the child met criteria) were expected to endorse more stable, global, uncontrollable, and external attributions about their children's misbehaviors compared to attributions made by parents who believed that their children did not have ADHD (whether or not that turned out to be true). Because there may or may not be

isomorphism of parental belief about child diagnosis and actual diagnosis, this was tested as a separate analysis.

Hypothesis 2: Maternal attributions and role adjustment

Hypothesis 2. Maternal attributions were expected to be related to maternal role-adjustment.

Maternal cognitions and beliefs about family problems have been related to maternal adjustment to those problems and to maternal role-specific adjustment. It was expected that this relation would depend upon child diagnosis. However, two competing hypotheses were tested for thoroughness. That is, it was hypothesized that in dimensional analyses, maternal attributions about their child's behavior would be related to their own role-specific adjustment, with stable, global, controllable, and internal attributions being related to greater role stress. This prediction that attributions would be related to controllable attributions was based on general literature (Dix & Grusec, 1985) with parents of non-disordered children. Such a finding would indicate that regardless of child diagnosis, controllable attributions for misbehaviors lend toward parental stress. The current author expected that the dimensional relation between attributions and adjustment would be mediated by child symptoms and moderated by child diagnosis; thus, in addition to testing for the simple correlation, this hypothesis was explored controlling for controlling for child behaviors and then child diagnosis. If the relation between maternal attributions and adjustment were mediated by child behaviors, the importance of diagnosis would indirectly be supported. If maternal attributions were found to be independently related to role stress (with child behaviors controlled), then the

attributional profile would appear to not depend upon diagnosis. Notably, the moderation hypothesis would best test the role of diagnosis in the relation between maternal attributions and adjustment.

Prediction 2a. Attributions of internality, stability, globality, and controllability about child misbehavior were expected to relate to high levels of parental stress, when all subjects were included in dimensional analyses. 2b) This relation was expected to be mediated by child behavioral severity. 2c) Alternatively, this relation could have been independent of child behavior, which would support an independent relation between maternal attributions about child behavior and maternal stress.

Note re: analyses: For hypothesis 2b, parent perception of child severity was proposed for this analysis. There are multiple considerations that led to this decision. 1) Parents may be stressed by the fact that they think their child behaves badly or because they think the behavior has a particular cause. Whether parents' attributions determine stress could thus be checked by covarying parent perception of the child behavior. 2) To test whether parent stress was due to actual child behavior or because of their attributions would ideally be tested with observational data that was beyond the scope of the proposed study.

Hypothesis 3: Moderation by child diagnosis

Hypothesis 3) In further understanding the relation between maternal attributions and role adjustment, this relation was expected to depend upon (be moderated by) child diagnosis. [The interaction between parent attributions and child diagnosis was expected to be significant in predicting parental adjustment].

Exploratory Analyses.

Exploratory Analysis 1: Maternal Attributions and child dimensional behaviors

Exploratory Analysis 1. It was proposed to examine maternal attributions in relation to severity of child behavior (collapsed across diagnostic groups); however, this analysis was part of the analyses covered in Hypothesis 2b.

Because no known current studies have examined parent attributions about child misbehaviors from a dimensional perspective and parent attributions may vary not just by child diagnosis (the primary question of interest in the proposed study) but also by severity of child behaviors, it is reasonable to test this.

Prediction Exp Analysis 1. In order to understand how mother's beliefs relate to child disruptive behaviors (inattention, hyperactivity, and aggression), examination of significant relations between maternal attributions and dimensional ratings of child behaviors were conducted. To compare mother versus teacher ratings (and versus other parent ratings of child behavior) would allow a possible separation of mother's perception of child behavior and actual child behavior. It should be noted, however, that the literature shows that differences do exist across raters when examining child ADHD behavior. No conclusions could be drawn from these analyses. Maternal attributional ratings of internality, stability, globality, and uncontrollability would be expected to be related to greater severity of child hyperactivity, inattention, and aggression. No predictions were made about ratings by mother versus teachers (or versus fathers).

Exploratory Analysis 2: Maternal responsibility and control

In prior studies, attributions about child controllability have been found as key to parental adjustment (Dix & Grusec, 1985), the extent to which parents feel responsible for their child's behavior and the extent to which they feel both responsible and able (or unable) to control their child's behavior might be important in their adjustment. An additional exploratory analysis was that mothers' experience of responsibility would interact with her perceived ability to control her child's behavior, and that this interaction would predict parental role adjustment.

Exploratory Analysis 3: Child attributions

Child attributions about their own disruptive behaviors were expected to differ by diagnostic status and be correlated with severity of own behaviors. The bulk of the attribution and ADHD has examined attribution in relation to social or academic task outcomes, few studies (none known) have examined children's attributions in relation to their disruptive behaviors. There is a large body of literature on attributions and aggression, mostly social attributions (that is, attributions about others rather than about one's own behavior). To date, it is unclear whether children with ADHD tend to make more internal attributions (Carlson, Mann, & Alexander, 2000; studied effects of reward and response cost in relation to attributions and performance) or external attributions for negative events (Milich, 1994; studied attributions pertaining to failure on academic tasks). Very little if anything is known about such attributions made by children with ADHD in relation to disruptive behaviors and specifically to behaviors which they (versus another actor) might engage in. In order to shed light on the types of attributions

made by children about disruptive behaviors, the current study attempted to measure multiple attributional ratings about Inattentive-Overactive, Disobedient/non-compliant, and Positive/prosocial behaviors.

Exploratory Prediction 3a. Child attributions would differ based on diagnostic grouping. Specifically, children with ADHD were expected to ascribe disruptive behavior to more external, stable, global, and uncontrollable causes compared to the attributions made by non-disordered peers. The primary analyses were between ADHD and non-disordered children. Follow-up analyses examined possible differences between children with ADHD-inattentive type (ADD), ADHD-combined type (ADHD-C) and children with subthreshold problems.

Exploratory Prediction 3b. Child attributions would be related to their adult-rated behaviors. Child attributional ratings of externality, stability, globality, and uncontrollability were expected to correlate with greater severity of adult-rated child hyperactivity, inattention, and aggression (collapsed across child diagnostic groups).

CHAPTER 4 RESULTS FOR STUDY 1

Maternal Attributions

Hypothesis 1: Maternal attributions and child disruptive behaviors

Hypothesis 1a: Maternal Attributions and actual child diagnosis

For between group comparisons, child diagnostic group served as the independent variable with each attribution domain serving as dependent variables. One-way analysis of variance was computed with the independent variables having two levels (ADHD and controls). The ADHD group was composed of the ADHD-Combined and ADHD-Inattentive cases.

As shown in Table 36, mothers of children with ADHD made attributions that were more stable, global, and uncontrollable compared to mothers of children without a diagnosis of ADHD. For example, for the Inattentive-Overactive type of behavior, mothers of children with ADHD made attributions which were significantly more stable ($F[1, 81]=12.6, p<.001$), global ($F[1.81]=18.1, p<.001$), and uncontrollable ($F[1,81]=6.1, p<.05$)⁷.

This finding was true for each of the three behavioral types examined in the Written Analogue Questionnaire; that is, for Inattentive-Overactive, Disobedient/Oppositional, and Positive/Prosocial behavior types, mothers of children who had diagnosable ADHD made more stable, global, and uncontrollable attributions compared to mothers of children without such a diagnosis (see Table 36). No significant difference was found on the attribution domain of locus (internal versus external).

⁷ Note: Out of the possible $n=91$ (50 for ADHD groups combined and 41 for control group), only 81 mothers completed the WAQ dropping the sample size to 81 for these analyzes).

Table 36 Test of differences in attributions made by mothers of children with ADHD diagnosis versus mothers of children without a behavioral disorder, using the WAQ measure that describes child behavior problems.

	Control Mean (sd)	ADHD any type Mean (sd)	F statistic (df)	P value	Value on attrib measure	Attributions about ADHD group in comparison to control
WAQ IO stability	3.0 (1.6)	4.3 (1.6)	F(1,81)=12.6	P<.001	1=unstable 10=stable	ADHD more stable
WAQ IO globality	4.0 (1.9)	5.8 (1.9)	F(1,81)=18.1	P<.001	1=specific 10=global	ADHD more global
WAQ IO locus	5.8 (2.3)	6.2 (1.9)	F(1,81)=.55	Ns	1=external 10=internal	No sig difference
WAQ IO control	8.1 (1.8)	6.9 (2.4)	F(1,81)=6.1	P<.01	1=uncontrollable 10=controllable	ADHD less controllable
WAQ OPP stability	2.7 (1.6)	4.2 (2.1)	F(1,81)=13.2	P<.001	1=unstable 10=stable	ADHD more stable
WAQ OPP globality	Not available	Not available			1=specific 10=global	Not able to test
WAQ OPP locus	6.8 (2.0)	6.9 (2.0)	F(1,81)=.05	Ns	1=external 10=internal	No sig difference
WAQ OPP control	8.6 (1.6)	7.6 (2.0)	F(1,81)=6.5	P<.01	1=uncontrollable 10=controllable	ADHD less controllable
WAQ Positive stability	2.7 (1.6)	4.2 (2.1)	F(1,81)=13.2	P<.001	1=unstable 10=stable	ADHD more stable
WAQ Positive globality	3.5 (1.9)	5.5 (2.1)	F(1,81)=18.9	P<.001	1=specific 10=global	ADHD more global
WAQ Positive locus	6.8 (2.0)	6.9 (2.0)	F(1,81)=.05	Ns	1=external 10=internal	No sig difference
WAQ Positive control	8.6 (1.6)	7.6 (2.0)	F(1,81)=6.5	P<.01	1=uncontrollable 10=controllable	ADHD less controllable/ More uncontrollable

*IO=Inattentive-Overactive type of behavior

*OPP=oppositional/disobedient type of behavior

Controlling for child aggressive behavior

When controlling for child aggressive behavior, the only group differences for maternal attributions about children's ADHD behaviors was on the attribution of locus. When examining child prosocial behaviors, a group difference was found pertaining to maternal attributions of control (again even with child aggressive behaviors controlled).

Controlling for medication status on subset of sample

Although not originally proposed, for the limited number of subjects for whom medication status was available ($n=64$), group differences on maternal attributions were analyzed controlling for medication status (child regularly taking medications for ADHD or not). Using, ANCOVA analyses, no significant affects were found when controlling for medication status.

Subtype Analyses

A unique contribution of the current study was to examined findings by subtype of ADHD. Thus, after the initial analyses, a one-way analysis of variance was computed comparing with the independent variable having four levels (ADHD-C, ADD, subthreshold, and controls). As shown in Table 37, most often differences were between the ADHD-C and control group; however, group differences were found between each type of "disordered" group (ADHD-C, ADD, subthreshold) and the control group for maternal attributions about IO behavioral globality. Also, maternal attributions differed by type of ADHD diagnosis (ADHD-C vs. ADD) for WAQ stability of Oppositional behavior, WAQ stability and globality of positive behavior. Maternal attributions differed between mothers of children with ADD versus mothers of children with

subthreshold ADHD (either type) symptomatology for WAQ attributions related to locus of positive behavior and locus of Oppositional behavior.

These analyses revealed that group differences were frequently but not exclusively driven by differences between ADHD-Combined subtype and controls. A notable finding was that in the four-group comparison, differences were found for mothers' attribution of locus pertaining to Oppositional and Positive behaviors (but not pertaining to Inattentive-Overactive behaviors). For this group, children with ADD-inattentive type differed from children with subthreshold ADHD symptomatology. Mothers' ratings of the behavior of their children with ADD-inattentive were more internal compared to the ratings made by mothers of children with subthreshold symptoms.

When controlling for child aggression, only maternal globality attributions about child prosocial behaviors remained significantly different across subtypes.

Table 37 Results of maternal attributions about child behavior, testing for group differences when comparing the independent variable of child diagnosis with four levels (ADHD-C, ADD, subthreshold, and controls), dependent variable=attribution domain by behavior type

	Control	a ADHD- Combined	b ADD - Inattentive	c Sub- threshold ADHD	F stat (df)	p-value	Value on attrib measure	Conclusions
WAQ IO stability	3.0 ^a (1.6)	4.6 (1.7)	3.5 (1.1)	3.8 (1.6)	5.5 (3,115)	P<.001	1=unstable 10=stable	Only control and ADHD-C differ
WAQ IO globality	4.0 ^{abc} (1.9)	5.9 ^a (2.0)	5.6 ^b (1.8)	5.3 ^c (1.9)	6.4 (3,114)	P<.001	1=specific 10=global	Each “disordered” group, including sub-threshold differ from control”
WAQ IO locus	5.8 (2.3)	6.1 (1.9)	6.3 (1.9)	5.7 (2.1)	0.3 (3,115)	n.s.	1=external 10=internal	No group differences were found
WAQ IO control	8.1 ^a (1.8)	6.6 ^a (2.4)	8.0 (2.5)	7.1 (2.2)	3.6 (3,114)	P<.01	1=uncontro llable 10=controll able	Only control and ADHD-C differ
WAQ OPP stability	2.7 ^a (1.6)	4.7 ^{ab} (2.1)	2.0 ^b (1.4)	3.8 (1.5)	8.5 (3,114)	P<.001	1=unstable 10=stable	ADHD-C and control differ ADHD-C and ADD differ
WAQ OPP locus	6.8 (2.0)	6.5 (1.9)	8.2 ^e (2.1)	6.2 ^e (2.1)	3.0 (3,114)	P<.05	1=external 10=internal	ADD and subthreshold differ
WAQ OPP control	8.6 ^a (1.6)	7.3 ^a (1.9)	8.4 (2.3)	7.7 (1.7)	3.8 (3,114)	P<.01	1=uncontro llable 10=controll able	ADHD-C and control differ
WAQ Positive stability	2.7 ^a (1.6)	4.7 ^{ab} (2.1)	2.9 ^b (1.4)	3.8 (1.5)	3.0 (3,114)	P<.05	1=unstable 10=stable	ADHD-C and control differ ADHD-C and ADD differ
WAQ Positive globality	3.5 ^a (1.9)	5.6 ^{ab} (2.0)	5.3 ^b (2.6)	4.5 (1.8)	3.8 (3,114)	P<.01	1=specific 10=global	ADHD-C and control differ ADHD-C and ADD differ
WAQ Positive locus	6.8 (2.0)	6.5 (1.9)	8.1 ^e (2.1)	6.2 ^e (2.1)	8.7 (3,114)	P<.001	1=external 10=internal	ADD and subthreshold differ
WAQ Positive control	8.6 ^a (1.6)	7.3 ^a (1.9)	8.4 (2.3)	7.7 (1.7)	6.8 (3,114)	P<.001	1=uncontro llable 10=controll able	ADHD-C and control differ

*IO=Inattentive-Overactive type of behavior

*OPP=oppositional/disobedient type of behavior

a indicates significant difference between control and adhd combined groups

b indicates significant difference between control and add inattentive groups

c indicates significant difference between control and “subthreshold” groups

d indicates significant difference between adhd and add group

e indicates significant differences between add and subthreshold groups

f indicate significant difference between adhd and “subthreshold” groups

In summary, mothers of children with ADHD viewed their children's behavior as more stable, global, and uncontrollable than did mothers of children without a diagnosis of ADHD. These results were largely due to attributions by mothers of children with ADHD-Combined type. Results did not remain significant when controlling for child aggression.

Results were largely similar when using the Recalled Incident Interview (see Appendix C), although sub-group differences (see Appendix D) were not as consistent.

Hypothesis 1b: Maternal Attributions and beliefs about diagnosis

Maternal attributions were examined in relation to beliefs about a possible ADHD diagnosis. Out of 126 subjects, 109 mothers answered a question as to belief about child's ADHD diagnosis. Each mother was asked: "do you believe that your child has ADHD, whether or not you have been told he or she has ADHD?" Forty-seven mothers answered, "yes", they believed their child to have ADHD (whether or not he/she had been diagnosed). Sixty-two mothers answered that no, they did not believe their child to have ADHD (whether or not he/she had been diagnosed). Only one mother indicated that her child had been diagnosed with ADHD but that she did not agree with the diagnosis. When looking at diagnostic classification, only 75 (of those 109) children were classified as ADHD or normal control by our study procedure. (The others were subthreshold). Of those 75 mothers (whose child was classified as ADHD or non-ADHD) and who answered the item regarding her belief about her child's diagnostic status, 43 had children whom we classified as meeting criteria for ADHD and 32 had children whom we

classified as non-ADHD subjects. Twenty-nine had children with subthreshold ADHD symptoms.

Table 38 Cross-tabulation of child diagnosis with mothers' belief about diagnosis

Actual child diagnosis based on study testing	Believe child has ADHD	Believe child has ADHD and child has prior ADHD dx	Believe child does not have ADHD and no ADHD dx in past	Believe child does not have ADHD although was given that dx	Totals	
Control	1	0	33	0	32	32
ADHD-C	7	18	9	0	32	43
ADD-inattn	3	2	5	0	10	
ADHD-hyp	0	1	0	0	1	
Subthreshold	8	7	14	1	29	29
Totals	19	28	61	1	109	
	47		62			109

When using this “belief about ADHD” variable to separate mothers into two groups (believe child has ADHD vs. believe child does not have ADHD) results were qualitatively similar to those when using actual child diagnosis (see Tables 36 and 37). That is, using the “belief” item, the pattern of results pertaining to maternal attributions when looking at differences based on belief about ADHD diagnosis (believe ADHD vs. believe no ADHD) (see Table 39) were similar to the pattern of results when examining group differences based on actual diagnosis (Table 36). For example, mothers who believed their child had ADHD answered qualitatively similarly on attributions related to Inattentive-Overactive behaviors and Disobedient behaviors when compared to mothers of children who actually had ADHD. Their attributions were more global, stable, and uncontrollable than mothers who did not believe their child had ADHD.

Qualitatively, two findings were different from results found when using actual child diagnosis. Mothers who believed their child to have ADHD ascribed positive behaviors as (a) more under the child’s control (more controllable) and (b) more specific

to a particular situation, than mothers who believed their child to be free of ADHD.

Recall that for actual diagnosis, mothers of children with ADHD ascribed positive behaviors as (a) less under the child's control and (b) less specific (more global) to a particular situation.

Table 39 Test of differences in attributions made by mothers of children who indicated that they “believe their child has ADHD” (whether or not our testing confirmed or disconfirmed this) versus mothers who believe their child “does not have ADHD); attributions as measured by the WAQ standardized scenarios in which to imagine own child engaging.

	Mother answered that she believe child has ADHD Mean (sd)	Mother answered that she believe Child does not have ADHD Mean (sd)	F statistic (df=1, 105)	P value	Value on attrib measure	Attributions when believe child has ADHD compared to belief child does not
WAQ IO stability	4.3 (1.7)	3.3 (1.7)	7.8	P<.01	1=unstable 10=stable	More stable
WAQ IO globality	5.9 (2.1)	4.6 (1.9)	11.5	P<.001	1=specific 10=global	More global
WAQ IO locus	5.8 (1.9)	6.0 (2.2)	.09	n.s.	1=external 10=internal	No sig difference
WAQ IO control	6.7 (2.4)	7.8 (2.0)	7.0	P<.01	1=uncontrollable 10=controllable	More uncontrollable
WAQ ODD stability	4.4 (1.8)	3.1 (1.8)	12.5	P<.001	1=unstable 10=stable	More stable
WAQ ODD globality	Not available	Not available	Not available	Not available	1=specific 10=global	NA
WAQ ODD locus	6.4 (2.0)	6.7 (2.2)	0.4	n.s.	1=external 10=internal	No sig diff
WAQ ODD control	7.3 (2.0)	8.4 (2.7)	9.7	P<.01	1=uncontrollable 10=controllable	More uncontrollable
More WAQ Positive stability	4.4 (1.8)	3.1 (1.8)	12.5	P<.001	1=unstable 10=stable	More stable
WAQ Positive globality	5.3 (2.0)	4.2 (2.1)	8.0	P<.01	1=specific 10=global	More specific/Less global
WAQ Positive locus	6.4 (2.0)	6.7 (2.2)	0.42	n.s.	1=external 10=internal	No sig diff
WAQ Positive control	7.3 (2.0)	8.4 (1.7)	9.7	P<.01	1=uncontrollable 10=controllable	More controllable

Overall, hypothesis 1 was supported.

Additional analysis: maternal attributions and dimensional child behaviors

As shown in Table 40, maternal attributions were related to child behaviors such that greater endorsement of stability and globality attributions was related to higher levels of child disruptive behaviors as rated by both mothers and teachers. Maternal attributions of control were negatively correlated with child disruptive behaviors, again using both mother and teacher ratings of child behaviors.

Table 40: Correlations between maternal attributions and child behaviors

	Mom rating of child Inattn	Mom rating of child Hyp	Mom rating of child ODD	Teacher rating of child Inattn	Teacher rating of child Hyp	Teacher rating of child ODD
WAQ IO stability	.41***	.34***	.35***	.27**	.28**	.17+
WAQ IO globality	.47***	.43***	.44***	.34***	.25*	.23+
.WAQ IO locus	.08	.08	.15+	.09	.09	-.01
WAQ IO control	-.29**	-.20*	-.10	-.20*	-.23*	.01
WAQ ODD stability	.43***	.44***	.46***	.25*	.32**	.30**
.WAQ ODD globality	Not available	Not available	Not available	Not available	Not available	Not available
WAQ ODD locus	-.04	.01	.05	.07	.07	.03
WAQ ODD control	-.31***	-.15	.00	-.20*	-.18+	-.07
More WAQ Positive stability	.43***	.44***	.46***	.25*	.32**	.30**
WAQ Positive globality	.27***	.49***	.51***	.32**	.34***	.34**
WAQ Positive locus	-.04	.01	.05	.07	.07	.03
WAQ Positive control	-.31***	-.15	.01	-.20+	-.18+	-.07

Hypotheses 2 and 3. Maternal Attributions and Role Adjustment

Hypothesis 2a was that attributions of internality, stability, globality, and controllability about child misbehavior would correlate with maternal stress (or low levels of satisfaction) when all subjects were included. In essence, this hypothesis aimed to replicate early findings in parents of non-disordered children (Grusec & Dix, 1985). Hypothesis 2b was that this relation would be independent from child behavior problems. Hypothesis 2c was that this relation would be mediated by child behavior. Hypothesis 3 was that the relation between parent attributions and role adjustment would be moderated by child behavior problems or diagnosis. Notably, Hypothesis 2b and 2c are alternative hypotheses to be explored for each of the disruptive behavior types (inattentive/overactive and oppositional/disobedient). It was uncertain what findings would reveal regarding these contrasting hypotheses and for each behavior type. Based on the literature, Hypothesis 3 was expected to be the clearest result. Thus, the expectation was that the relation would be moderated by child diagnosis but as results are exploratory all analyses are included.

Hypothesis 2a: Dimensional relation between attributions and stress.

As hypothesized, greater stability and globality were associated with lower levels of role satisfaction and higher levels of role stress (see Table 41).

Table 41 Correlations between maternal attributions (using scenario measure, WAQ) and parent role stress and satisfaction (2-tailed)

	Mothers Perception of Parenting Performance	Mothers PSI Total Stress
WAQ IO stability	-.23*	.34***
WAQ IO globality	-.22*	.43***
WAQ IO locus	-.09	.15
WAQ IO control	.03	-.15
WAQ ODD stability	-.34***	.45***
WAQ ODD globality	NA	NA
WAQ ODD locus	-.12	.01
WAQ ODD control	.09	.09
WAQ Positive stability	-.34***	.45***
WAQ Positive globality	-.31***	.47***
WAQ Positive locus	-.12	.01
WAQ Positive control	.09	.16

***p<.001, **p<.01, *p<.05, +p<.1

Table 42 Correlations between maternal attributions (using scenario measure, WAQ) and parent role stress and satisfaction (1-tailed)

	Mothers Perception of Parenting Performance	Mothers PSI Total Stress
WAQ IO stability	-.23**	.34***
WAQ IO globality	-.22**	.43***
WAQ IO locus	-.09	.15+
WAQ IO control	.03	-.15+
WAQ ODD stability	-.34***	.45***
WAQ ODD globality	NA	NA
WAQ ODD locus	-.12	.01
WAQ ODD control	.09	-.16*
WAQ Positive stability	-.34***	.45***
WAQ Positive globality	-.31***	.47***
WAQ Positive locus	-.12	.01
WAQ Positive control	.09	-.16*

***p<.001, **p<.01, *p<.05, +p<.1

This finding was consistent across behavior types; that is, stability and globality ratings were related to less optimal parent adjustment (high stress, low satisfaction) for

Inattentive-Overactive, Oppositional/Disobedient, and Positive/Prosocial scenario behavior types. This finding was found consistently with the Written Analogue Questionnaire, a measure where parents to read a standard scenario and answer as if their child engaged in the behavior described. Results replicated in part with Recalled Incident Interview but only when using the (PSI) Total Stress measure as an outcome indicator (See Appendix E).

In summary, maternal attributions were related to role adjustment. Qualitatively larger relations were found between attributions and role adjustment when using the PSI-SF Total Stress as the outcome indicator. In summary, when examining the relation between attributions and adjustment regardless of child behavior or diagnostic group, stability and globality were related to maternal adjustment; whereas, locus and control were not. Thus, Hypothesis 2a was supported.

Examination By Subtype

Subtype analyses revealed that attributions of locus about Oppositional/disobedient and positive/prosocial behaviors were most consistently related to maternal adjustment for mothers of children with ADHD-Combined type even if not for mothers of other children. Notably, magnitude of relations between attributions and satisfaction were comparable across subtypes; the lack of findings pertaining to ADD-Inattentive type may be due to low sample size.

Table 43 Correlations between maternal attributions (using scenario measure, WAQ) and parent role stress and satisfaction (2-tailed)

	Controls	Controls	ADHD-C	ADHD-C	ADD-Inattentive	ADD-Inattentive
	Mothers Perception of Parenting Performance	Mothers PSI Total Stress	Mothers Perception of Parenting Performance	Mothers PSI Total Stress	Mothers Perception of Parenting Perform	Mothers PSI Total Stress
WAQ IO stability	-.48**	.20	-.17	.39*	-.29	-.05
WAQ IO globality	-.53**	.41*	-.28	.35+	-.16	.33
WAQ IO locus	-.15	.19	-.10	.26	-.17	.09
WAQ IO control	.20	-.16	.01	-.04	.30	.11
WAQ ODD stability	-.47**	.20	-.25	.50**	-.39	.28
WAQ ODD locus	-.14	.00	-.40*	.30+	.51	-.15
WAQ ODD control	.23	-.19	-.06	.10	.41	.02
WAQ Positive stability	-.47**	.20	-.25	.50**	-.39	.28
WAQ Positive globality	-.50**	.46**	-.38*	.74***	-.42	.19
WAQ Positive locus	-.14	.00	.40*	.30+	.51	-.15
WAQ Positive control	.23	-.19	-.06	.10	.41	.02

***p<.001, **p<.01, *p<.05, +p<.1

Table 44 Correlations between maternal attributions (using scenario measure, WAQ) and parent role stress and satisfaction (1-tailed)

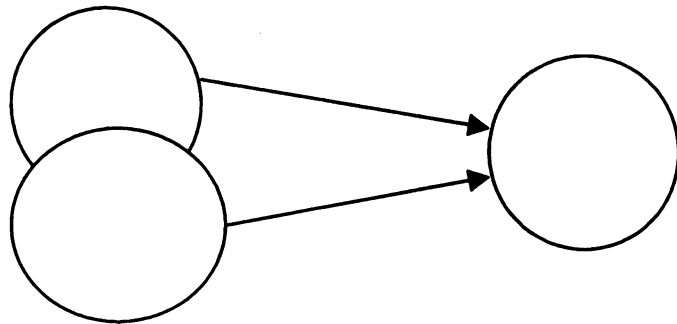
	Controls	Controls	ADHD-C	ADHD-C	ADD-Inattentive	ADD-Inattentive
	Mothers Perception of Parenting Performance	Mothers PSI Total Stress	Mothers Perception of Parenting Performance	Mothers PSI Total Stress	Mothers Perception of Parenting Perform	Mothers PSI Total Stress
WAQ IO stability	-.48**	.20	-.17	.39*	-.29	-.05
WAQ IO globality	-.53**	.41**	-.28+	.35*	-.16	.33
WAQ IO locus	-.15	.19	-.10	.26+	-.17	.09
WAQ IO control	.20	-.16	.01	-.04	.30	.11
WAQ ODD stability	-.47**	.20	-.25+	.50**	-.39	.28
WAQ ODD locus	-.14	.00	-.40*	.30*	.51*	-.15
WAQ ODD control	.23+	-.19	-.06	.10	.41+	.02
WAQ Positive stability	-.47**	.20	-.25+	.50**	-.39	.28
WAQ Positive globality	-.50**	.46**	-.38*	.74***	-.42+	.19
WAQ Positive locus	-.12	.00	-.40*	.30*	.51*	-.15
WAQ Positive control	.23+	-.19	-.06	.10	.41+	.02

***p<.001, **p<.01, *p<.05, +p<.1

Hypothesis 2b. Independence of maternal attributions.

This hypothesis aimed to address whether maternal attributions uniquely predicted maternal role adjustment (over and above what child behaviors contributed). As found in 2a, when child behaviors were not considered, mothers' attributions of stability and globality correlated with maternal role adjustment whereas locus and control did not. The next step in testing for unique prediction is to correlate (or regress) maternal attributions with maternal adjustment, controlling for child behaviors. Thus, to test whether attributions uniquely predicted role adjustment, independent of child behaviors, attributions and child behaviors were entered into a regression equation together. Type III Sum of Squares was used to examine the effect of one variable controlling for all others entered into the equation.

Unique prediction (non shared variance)



As shown in Tables 45 and 46, maternal attributions about Inattentive/Overactive behaviors were not related to maternal role adjustment when child behavior was also in the model. That is, maternal attributions about child inattentive/overactive behavior did not uniquely predict maternal role adjustment. In contrast, attributions about the stability

of Oppositional/Disobedient behaviors were uniquely related to maternal adjustment,
even when child behaviors were controlled.

Table 45 Regression to test relation between maternal attributions and maternal role adjustment independent of child behaviors (step 3) and test of moderation (step 4); with dependent variable=PSS Satisfaction with Parenting for all models

	Predictor variable	Beta step 1	Beta step 2	Beta step 3	Beta step 4	R ² Change Step 1	R ² Change Step 2	R ² Change Step 3	R ² Change Step 4
Model 1	Child Inattn	-.12	-.12	-.09	-.09	.10**			
	Child Hyp	-.23	-.07	-.08	-.16				
	Child Disobedient/ Oppositional		-.18	-.16	-.27		.01		
	Globality about IO behavior			-.08	-.13			.01	
	Interaction term Inat*hyp*odd*attrib				.24				.02
Model 2	Child Inattn	-.11	-.11	-.07	-.08	.10**			
	Child Hyp	-.23+	-.08	-.09	-.16				
	Child Disobedient/ Oppositional		-.18	-.16	-.27		.01		
	Stability about IO behavior			-.13	-.19+			.01	
	Interaction ter Inat*hyp* attrib				.25				.02
Model 3	Child Inattn	-.12	-.12	-.07	-.06	.10**			
	Child Hyp	-.23+	-.07	-.06	-.12				
	Child Disobedient/ Oppositional		-.18	-.12	-.22		.01		
	Stability about ODD behavior			-.24*	-.34**			.05*	
	Interaction term ODD*attrib				.25+				.02+

***p<.001, **p<.01, *p<.05, +p<.1

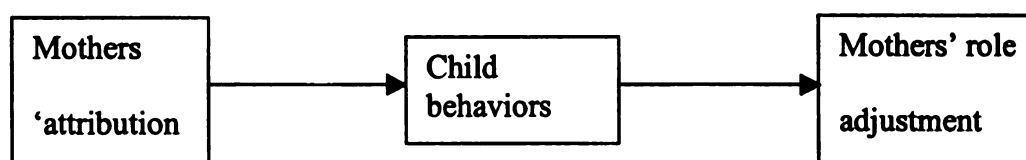
Table 46 Regression to test relation between maternal attributions and maternal role adjustment independent of child behaviors (step 3) and test of moderation (step 4); with dependent variable=PSI SF Total Stress for all models

	Predictor variable	Beta step 1	Beta step 2	Beta step 3	Beta step 4	R ² Change Step 1	R ² Change Step 2	R ² Change Step 3	R ² Change Step 4
Model 1	Child Inattn	.18+	.20+	.15	.15	.43***			
	Child Hyp	.52***	.18	.19	.21				
	Child Disobedient/ Oppositional		.40**	.36**	.39**		.05**		
	Globality about IO behavior			.13	.14			.01	
	Interaction term				-.06				.00
Model 2	Child Inattn	.18+	.19+	.16+	.16+	.43***			
	Child Hyp	.52***	.19	.19	.19				
	Child Disobedient/ Oppositional		.39**	.38**	.37**		.05**		
	Stability about IO behavior			.10	.10			.17	
	Interaction term				-.01				.00
Model 3	Child Inattn	.18+	.20+	.16+	.16+	.43***			
	Child Hyp	.52***	.18	.18	.18				
	Child Disobedient/ Oppositional		.40**	.35**	.36**		.05**		
	Stability about ODD behavior			.16*	.18+			.02*	
	Interaction term				-.03				.00

***p<.001, **p<.01, *p<.05, +p<.1

An alternative to maternal attributions uniquely predicting maternal role adjustment was the possibility that child behaviors mediated the relation between maternal attributions and role adjustment.

Mediation Model



The results shown in Tables 45 and 46 suggest that child behaviors mediated the relations between maternal attributions about child inattentive/overactive behaviors and maternal role adjustment. That is, the significant relations found between attributions

about IO behaviors and maternal role adjustment (in 2a) became non-significant when child behaviors were included in the model. Child behaviors also partially mediated relation between attributions about ODD behaviors and maternal adjustment (i.e., relation of attribution and adjustment decreased from -.34 to -.24 using PSS and from -.45 to .16 using PSI).

To test the full mediation model, two additional tests were required. Specifically, for the mediation model to be supported, not only must the prior significant relations (between attributions and role stress) become non-significant but child behaviors must also be significantly related to maternal attributions. Step 1 in Tables 43 and 44 displayed the significant relations between child behaviors and maternal adjustment; significant relations were found between attributions and adjustment only when using the PSI Total Stress score (not when examining the parenting satisfaction score). Additionally, as shown in Table 47, child behaviors were significantly related to maternal attributions.

Table 47 Correlations between maternal attributions about child behavior in relation to mother and teacher ratings of child behaviors (2-tailed)

	Mom rating of child Inattention	Mom rating of child hyperactivity	Mom rating of child OPP/disobedient Behavior
WAQ IO globality	.47***	.43***	.44***
WAQ IO stability	.41***	.34***	.35***
WAQ ODD stability	.43***	.44***	.46***

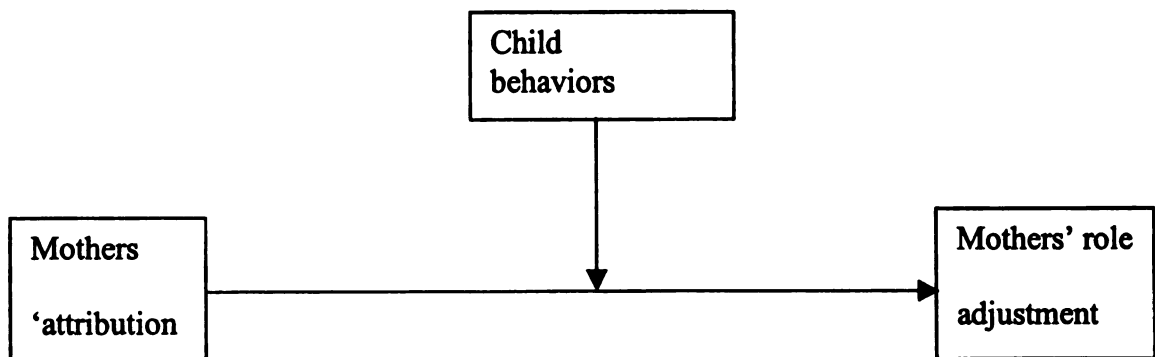
***p<.001, **p<.01, *p<.05, +p<.1

Thus, child behaviors appeared to mediate the relation between maternal attributions about IO behaviors and maternal stress (when using PSI as outcome); that is, when child behaviors were in the model, the relation between maternal attributions and maternal stress was no longer significant. Child behavioral severity, thus, explained the relation between maternal attributions and maternal stress (using PSI measure but not with PSS measure).

Additional analysis: Moderation by severity of child behavior

A third possibility was that dimensional severity of child behavior moderated the relation between maternal attributions and role adjustment.

Moderation By Severity of Child Behaviors



For moderation to be supported, the interaction term (child behaviors*attribution) should be significant after controlling for the variance due to main effects. The test for moderation by severity of child behaviors was also shown in Tables 45 and 46. The interaction term was not significant. That is, the moderation effect was not found when examining the interaction between attributions and child behavioral severity.

In summary, attributions about Oppositional/Disobedient behavior appear to function somewhat differently than attributions Inattentive/Overactive behaviors. Stability attributions about oppositional/disobedient behaviors predicted role adjustment above and beyond that accounted for by child behaviors to a small but significant degree. Child behaviors partially mediated this relation. In contrast, attributions about child inattentive/overactive behaviors appeared to be entirely mediated by severity of child behaviors; that is, child behaviors explained the relation between attributions about IO behaviors and parent role adjustment.

The significant amount of shared variance among child behavior variables (see methods section) presents some interesting challenges to the analyses and understanding of the results (a complication to studying ADHD). In order to provide comprehensive data so that the subtleness of the effects of such shared variance may be discussed, Tables 48 and 39 are included here, showing the test for uniqueness of attribution and test for moderation when controlling only for the behavior related to the attribution of interest. When controlling for only the behavior related to the specific attribution, the moderation effect was significant for attributions of stability about IO behaviors and severity of child IO behaviors but only in relation to PSS.

Table 48 Regression to test relation between maternal attributions and maternal role adjustment independent of child behaviors (step 2) and test of moderation (step 3); with dependent variable=PSS Satisfaction with parenting performance (controlling only for behavior related to the attribution of interest)

		Beta step 1	Beta step 2	Beta step 3	R ² Change Step 1	R ² Change Step 2	R ² Change Step 3
Model 1	Child Inattn	-.12	-.08	-.15	.10**		
	Child Hyp	-.23+	-.21+	-.49*			
	Globality about IO behavior		-.10	-.23+		.01	
	Interaction term			.00+			.03+
Model 2	Child Inattn	-.11	-.07	-.15	.10**		
	Child Hyp	-.13+	-.22+	-.52**			
	Stability about IO behavior		-.14	-.32**		.02	
	Interaction term			.51**			.05**
Model 3	Child Disobedient/ Oppositional	-.31**	-.20*	-.42*	.10**		
	Stability about ODD behavior		-.26**	-.45**		.06**	
	Interaction term			.36			.02

***p<.001, **p<.01, *p<.05, +p<.1

Table 49 Regression to test relation between maternal attributions and maternal role adjustment independent of child behaviors (step 2) and test of moderation (step 3); with dependent variable=PSI-SF Total Stress (controlling only for behavior related to the attribution of interest)

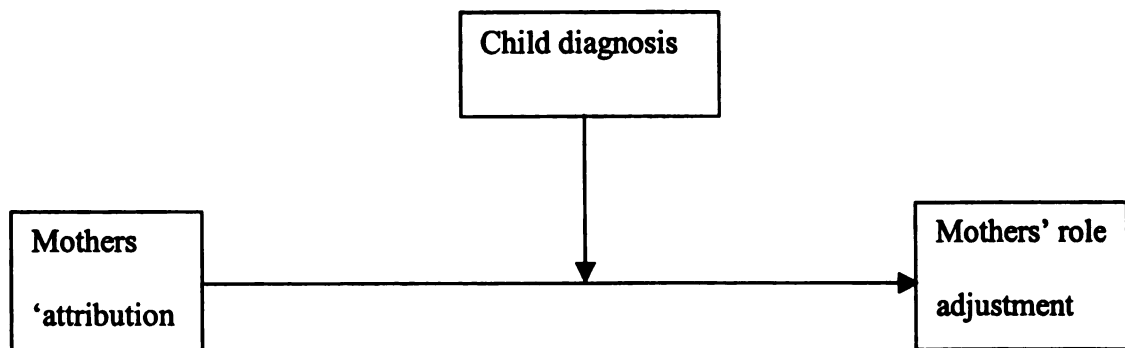
	Predictor variable	Beta step 1	Beta step 2	Beta step 3	R ² Change Step 1	R ² Change Step 2	R ² Change Step 3
Model 1	Child Inattn	.18+	.12	.13	.43***		
	Child Hyp	.52***	.49***	.54***			
	Globality about IO behavior		.16+	.19+		.02+	
	Interaction term			-.08			.00
Model 2	Child Inattn	.18+	.14	.14	.43***		
	Child Hyp	.52***	.51***	.52***			
	Stability about IO behavior		.12	.13		.01	
	Interaction term			-.02			.00
Model 3	Child Disobedient/ Oppositional	.66***	.57***	.55***	.43***		
	Stability about ODD behavior		.21**	.20		.04**	
	Interaction term			.02			.00

***p<.001, **p<.01, *p<.05, +p<.1

Hypothesis 3 – Moderation by Child Diagnosis

This hypothesis aimed to address whether the relation between parent attribution and parental role adjustment moderated by child diagnosis.

Diagnosis as Moderator



ADHD diagnosis predicted parental adjustment ($r=.36$, $p=.002$; see also Tables 50 and 51 beta step 2) and attributions marginally predicted parental adjustment (r ranges from $-.22$ to $-.34$, $p<.01$ to $p<.01$, refer back to Table 41).

As shown in Table 51, ADHD diagnosis partially moderated the relation between maternal attributions and adjustment when using PSI Total Stress as an outcome variable (but not when using PSS Satisfaction with Parenting Performance as outcome). Although not hypothesized, Tables 50 and 51 show that diagnosis partially mediated (to a small extent) the relation between maternal attributions and adjustment; that is, the magnitude of the relation decreased when diagnosis was included in the model. Partial mediation was found when using the PSS Satisfaction with Parenting as well as when using the PSI Total Stress as outcome variable.

Table 50 Regression to test moderation of diagnostic variable (control vs. any type of ADHD) in the relation of maternal attributions and role adjustment, dependent variable=PSS satisfaction with parenting performance

	Predictor variable	Beta step 1	Beta step 2	Beta step 3	R ² Change Step 1	R ² Change Step 2	R ² Change Step 3
Model 1	Globality about IO behavior	-.51***	-.44***	-.46**	.27***		
	ADHD diagnosis		-.18	-.19		.03	
	Interaction term			.05			.00
Model 2	Stability about IO behavior	-.43***	-.38**	-.36**	.18***		
	ADHD diagnosis		-.16	-.15		.02	
	Interaction term			-.04			.00
Model 3	Stability about ODD behavior	-.47***	-.38**	-.61**	.22***		
	ADHD diagnosis		-.21+	-.59*		.03+	
	Interaction term			.55+			.03+

*** $p<.001$, ** $p<.01$, * $p<.05$, + $p<.1$

Table 51: Regression to test moderation of diagnostic variable (control vs. any type of ADHD) in the relation of maternal attributions and role adjustment, dependent variable=PSI Total Stress as outcome

	Predictor variable	Beta step 1	Beta step 2	Beta step 3	R ² Change Step 1	R ² Change Step 2	R ² Change Step 3
Model 1	Globality about IO behavior	.53***	.34**	.16	.28***		
	ADHD diagnosis		.44***	.31**		.16***	
	Interaction term			.40**			.09**
Model 2	Stability about IO behavior	.39***	.26*	.05	.15***		
	ADHD diagnosis		.43***	.28**		.17***	
	Interaction term			.51***			.17***
Model 3	Stability about ODD behavior	.53***	.33**	.16	.28***		
	ADHD diagnosis		.45***	.16		.16***	
	Interaction term			.42			.02

***p<.001, **p<.01, *p<.05, +p<.1

Additional Tests to Further Examine the Role of Locus and Controllability

To be certain that effects of controllability and locus were not masked by diagnostic or mediation effects, the moderation test was examined for controllability and locus. None of the interactions terms were significant, indicating that possible relations with adjustment and attributions of locus and controllability were not masked by ADHD vs. non ADHD diagnostic categorization nor by medication status. However, as discussed, subtype analyses reveal that attributions of locus about Oppositional/disobedient and positive/prosocial behaviors were related to maternal adjustment for mothers of children with ADHD-Combined type even if not for mothers of other children.

Summary of Maternal Attribution Findings

As predicted, mothers of children with ADHD attributed disruptive child behaviors to more stable, global, and uncontrollable child factors than parents of control children. No group differences were found pertaining to attributions of locus.

Second, as predicted, stability and globality attributions were related to higher levels of role stress and lower levels of role satisfaction. Contrary to expectations, attributions pertaining to locus and controllability were not significantly related to role adjustment.

Third, maternal attributions about child inattentive/overactive behavior did not uniquely predict maternal role adjustment. In contrast, attributions about the stability of Oppositional/Disobedient behaviors were uniquely related to maternal adjustment, even when child behaviors were controlled. Fourth, dimensional severity of child behaviors mediated (but did not moderate) the relation between maternal attributions and stress. Notably, child diagnosis partially moderated the relation between maternal attributions and adjustment.

In summary, the relation between maternal attributions and adjustment does appear to depend upon child behaviors. Indeed, a compelling finding was the moderation finding; specifically, child diagnosis served as a moderator for attributions about IO behaviors in relation to maternal role adjustment.

In order to facilitate understanding and discussion of the findings, a brief summary of key findings is provided in Table 52.

Table 52 Summary of primary findings

Primary Question	Finding	Implications/relation to literature/further questions
Attributions by group	Attributions differed by diagnosis in direction expected, except attributions about positive behaviors not in direction expected Subtype analyses revealed that group differences were frequently but not exclusively driven by differences between ADHD-Combined subtype and controls.	Partial replication of Johnston, except in regard to positive beliefs by diagnosis Group differences in attributions of locus did appear to be masked by medication status.
Attributions by belief about diagnosis	Attributions also differed by belief about diagnosis, including positive behaviors in direction expected	
Dimensional relation between attributions and adjustment	Attributions were related to adjustment in direction expected, except that globality and stability of Positive as well as problem behaviors were related to stress Controllability attributions were not related to adjustment when groups combined	This analysis did not look at attributions and adjustment by group. Controllability attributions were not related to adjustment. Subtype analyses reveal that attributions of locus about Oppositional/disobedient and positive/prosocial behaviors were related to maternal adjustment for mothers of children with ADD-Combined type even if not for mothers of other children. Attributions about controllability did not appear to be obscured by combining the two groups; that is, no sig. Effects were found btwn controllability and adjustment even when examined separated by subtype.
Pathways for understanding relation between attributions and adjustment	Only attributions about ODD/disobedient behaviors were uniquely related to mothers' adjustment Child behavior mediated relation btwn mom attrib and adjustment for attrib about IO behaviors Child behavior partially mediated rel btwn mom attrib and adjustment for attrib about OPP behaviors No moderation by severity of child behaviors and attributions (one finding supported moderation but with attrib about IO stability using PSS controlling only for IO beh).	Attributions about ODD behavior appear to have more powerful impact on maternal adjustment than do attributions about IO behavior. Child behavior notably mediates relation between attributions and adjustment.
Attributions and Adjustment – group effects?	Diagnosis moderated relation between mothers' attribution and adjustment but only for IO behaviors using PSI Diagnosis partially mediated relation between mom attrib and adjustment	

Covariates

No group differences were found on any covariates (See Table 1). Thus, analyses were not conducted controlling for covariates at this point in time except for the examination of relation between maternal attributions and maternal adjustment with aggression controlled.

Table 53 Correlations between maternal attributions (using scenario measure, WAQ) and parent role stress and satisfaction, with child aggression/oppositional behaviors controlled (2-tailed)

	Controls	Controls	ADHD-C	ADHD-C	ADD-Inattentive	ADD-Inattentive
	Mothers Perception of Parenting Performance	Mothers PSI Total Stress	Mothers Perception of Parenting Performance	Mothers PSI Total Stress	Mothers Perception of Parenting Performance	Mothers PSI Total Stress
WAQ IO stability	-.49**	.20	-.09	.16	-.29	-.12
WAQ IO globality	-.50**	.35*	-.22	.08	-.04	.08
WAQ IO locus	-.09	.12	-.04	.09	-.19	.15
WAQ IO control	.14	-.07	.01	-.07	.44	-.14
WAQ ODD stability	-.48**	.19	-.20	.34+	-.26	-.25
WAQ ODD locus	-.09	-.08	-.36+ (p=.05)	.13	.56+	-.24
WAQ ODD control	.21	-.16	.01	-.17	.51	-.15
WAQ Positive stability	-.48**	.19	-.20	.34+	-.26	-.25
WAQ Positive globality	-.44**	.38*	-.35+	.55**	-.30	-.37
WAQ Positive locus	-.09	-.09	-.36+ (p=.05)	.13	.56+	-.24
WAQ Positive control	.21	-.16	.01	-.17	.51	-.15

***p<.001, **p<.01, *p<.05, +p<.1

Table 54 Correlations between maternal attributions (using scenario measure, WAQ) and parent role stress and satisfaction, with child aggression/oppositional behaviors controlled (1-tailed)

	Controls	Controls	ADHD-C	ADHD-C	ADD-Inattentive	ADD-Inattentive
	Mothers Perception of Parenting Performance	Mothers PSI Total Stress	Mothers Perception of Parenting Performance	Mothers PSI Total Stress	Mothers Perception of Parenting Performance	Mothers PSI Total Stress
WAQ IO stability	-.49**	.20**	-.09	.16	-.29	-.12
WAQ IO globality	-.49**	.35*	-.22	.08	-.04	.08
WAQ IO locus	-.09	.12	-.04	.09	-.19	.15
WAQ IO control	.14	-.07	.02	-.07	.44	-.14
WAQ ODD stability	-.48**	.19	-.20	.34*	-.26	-.25
WAQ ODD locus	-.09	-.08	-.36*	.13	.56*	-.24
WAQ ODD control	.21	-.16	.01	-.17	.51+	-.15
WAQ Positive stability	-.28	.19	-.20	.34*	-.26	-.25
WAQ Positive globality	-.44**	.26*	-.35*	.55**	-.30	-.38
WAQ Positive locus	-.09	-.08	-.36*	.13	.56*	-.24
WAQ Positive control	.21	-.16	.01	-.17	.51+	-.15

***p<.001, **p<.01, *p<.05, +p<.1

Exploratory Analyses 1: Maternal Attributions and child behaviors

This analysis tested the relation between maternal attributions in relation to severity of child behavior (collapsed across diagnostic groups). The predication was that maternal attributions that disruptive child behaviors are internal, uncontrollable, stable, and global would correlate with greater severity of dimensional child disruptive behaviors (inattention, hyperactivity, and aggression), whether using teacher or parent ratings of child behaviors.

This exploratory analysis was conducted even though the author had anticipated (and found) that attributions would differ by group. Thus, if attributions differed by group, dimensional relations would expected be obscured on those domains for which

differences were anticipated. Notably, in testing the possibility that child behaviors might mediate relation between parent attributions and adjustment, the relations between mothers' attributions and child behaviors was tested (Table 55), this was only for particular attributions. .

In order to examine dimensional relations between maternal attributions and severity of child behavior, correlations were conducted (see Table 55). As shown in Table 55 maternal attributions about stability and globality were consistently positively correlated with severity of child behavior problems, across types of behaviors. Also, corresponding with predictions, maternal attributions of control were negatively correlated with child behavior problem severity. This result was found with child ADHD behaviors (both Inattention [IO control and inattention, $r=-.29$, $p<.001$) and Hyperactivity (IO control and hyperactivity, $r=-.20$, $p<.05$]; see Table 55 but with not child Oppositional/Disobedient behaviors (OPP control and OPP behaviors, $r=.01$, n.s.). Also, as shown in Table 55 these results were found when using both mother and teacher ratings of child behaviors. As shown in Appendix F, results were similar although less strong (i.e., correlations were smaller in magnitude and with lower p values) when using the Recalled Incident Interview measure.

Table 55 Correlations between maternal attributions about child behavior in relation to mother and teacher ratings of child behaviors (3-factor analysis) (2-tailed)

	Mom rating of child Inattention	Mom rating of child hyperactivity	Mom rating of child OPP/disobedient Behavior	Teacher rating of child Inattention	Teacher rating of child Hyperactivity	Teacher rating of child OPP/disobedient Behavior
WAQ IO stability	.41***	.34***	.35***	.27**	.28**	.17+
WAQ IO globality	.47***	.43***	.44***	.34***	.25**	.23*
WAQ IO locus	.08	.08	.15	.09	.09	-.01
WAQ IO control	-.29***	-.20*	-.10	-.20*	-.23*	.01
WAQ ODD stability	.43***	.44***	.46***	.25*	.32***	.30**
WAQ OPP locus	-.04	.01	.05	.07	.07	.03
WAQ OPP control	-.31***	-.15	.01	-.20*	-.18+	-.07
More WAQ Positive stability	.43***	.44***	.46***	.25*	.32***	.30**
WAQ Positive globality	.47***	.49***	.52***	.32**	.34***	.34***
WAQ Positive locus	-.04	.01	.05	.07	.07	.03
WAQ Positive control	-.32***	-.15	.01	-.20*	-.18	-.07

***p<.001, **p<.01, *p<.05, +p<.1

Exploratory Analysis 2: Maternal responsibility and control

In prior studies, attributions about child controllability have been found as key to parental adjustment (Dix & Grusec, 1985). The extent to which parents feel responsible for their child's behavior and the extent to which they feel both responsible and able (or unable) to control their child's behavior might also be important in their adjustment. An additional exploratory analysis was that parental experience of responsibility might interact with perceived ability to control child's behavior in predicting parental role adjustment. [As an exploratory analysis, attributions about prosocial behavior were included].

As shown in Table 56, maternal attributions about own responsibility and ability to control child's behavior were related to role adjustment when considering child Oppositional/Defiant but not Inattentive-Overactive behaviors. Correlations were more consistently found between maternal attributions about own role and Satisfaction with Parenting Performance than with PSI Total stress. The magnitude of significant correlations ranged from $-.19$ ($p < .05$) to $-.39$ ($p < .001$). Notably, the Hoza interaction measure that measured mothers' attributions about own role in relation to child compliance and non-compliance appeared to be a good measure for this analysis (See Table 56).

Table 56 Correlations between attributions about parent's own role in child behavior (attributions of responsibility and control) in relation to parents' role adjustment (PSS satisfaction and PSI Total Stress). (2-tailed)

	PSS Satisfaction with Parenting Performance	PSI Total Stress
WAQ Parent responsibility to control child behavior Inattentive-Overactive (IO) behavior	-.06	-.01
WAQ Parent ability to control child behavior IO behavior	.22	-.19
WAQ Parent responsibility to control child behavior Oppositional (OPP) behavior	-.19*	.07
WAQ Parent ability to control child behavior Oppositional (OPP) behavior	.15	-.19
WAQ Parent responsibility to control child behavior Positive (POS) behavior	.12	-.10
RII Parent responsibility to control child behavior Inattentive-Overactive (IO) behavior	-.09	-.03
RII Parent ability to control child behavior IO behavior	-.23	-.31*
RII Parent responsibility to control child behavior Oppositional (OPP) behavior	-.20*	-.12
RII Parent ability to control child behavior Oppositional (OPP) behavior	.39**	-.37**
RII Parent responsibility to control child behavior Positive (POS) behavior	.15	-.12
RII Parent ability to control child behavior Positive (POS) behavior	-.06	.11
Hoza good parenting and ability to control Child non-compliant	.16+	-.1-
Hoza ability to control child compliant behavior	-.36***	.19*
Hoza effort to control Child non-compliant and compliant behavior	.20*	-.11
General good parenting Child non-compliant and compliant behavior	-.19*	.06

***p<.001, **p<.01, *p<.05, +p<.1

For the moderation analyses, only the PSS Satisfaction with parenting performance measure was used. Both the WAQ and RII were used as attribution measures. The RII was included as it was more reliably related to role adjustment compared to the WAQ. The Hoza measure did not correspond to the exploratory hypotheses (whereas Johnston's WAQ and RII did).

The test for the interaction between maternal attributions of responsibility and ability to control child Oppositional/Disobedient behavior was not significant, indicating that these two attributions do not interact with each other to predict maternal role satisfaction. Notably, however, maternal attributions about ability to control child Oppositional/Disobedient behaviors uniquely predicted maternal role satisfaction above and beyond attributions of responsibility. Thus, mothers' attributions about ability were more related to role satisfaction than responsibility.

As shown in Table 57, maternal attributions about ability to control child oppositional/disobedient behaviors were predictive above and beyond that which was predicted by mothers' ratings of child oppositional/disobedient behavior.

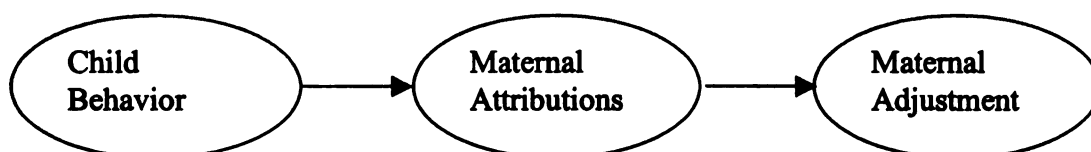
Table 57 Moderation test controlling for child behavior, using RII; PSS as outcome variable

Model 1	Predictor variable	Beta step 1	Beta step 2	Beta step 3	R ² Change Step 1	R ² Change Step 2	R ² Change Step 3
	RII Attribution of parental responsibility OPP behavior	-.19	-.20	.00	.19**		
	RII Attribution of parent ability to control of child OPP behavior	.38**	.33**	.44**			
	Mother rated Child Oppositional/Disobedient behavior		-.26*	-.03		.06*	
	Interaction term			-.32			.01

In summary, maternal attributions about own responsibility and ability to control child's behavior were related to role adjustment when considering child Oppositional/Defiant but not Inattentive-Overactive behaviors. Maternal attributions about ability to control child Oppositional/Disobedient behaviors uniquely predicted maternal role satisfaction above and beyond attributions of responsibility. Thus, mothers' attributions about ability were more related to role satisfaction than attributions about responsibility.

Exploratory Analysis 3: Mediation by maternal attributions

Child behaviors were examined as a mediator of the relation between child behavior and parental role adjustment.



There are four components to testing the mediation model. First, are child behaviors related to maternal adjustment (exploratory analysis 3a)? As shown in Table 58, severity of child behavior was significantly related to parent role stress.

Table 58 Correlations between child behaviors and maternal role adjustment (2-tailed)

	Satisfaction with parenting	Parent Stress Total
Mother rating of child inattention	-.27**	.55***
Mom rating of child Hyperactivity	-.31***	.65***
Mom rating of child Oppositional behavior	-.31***	.67***
Teacher rating of child inattention	-.15	.40***
Teacher rating of child Hyperactivity	-.34***	.51***
Teacher rating of child Oppositional behavior	-.31**	.49***

*** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .1$

The second step of testing the mediation model was to test whether child behavior is related to maternal attributions. As shown in exploratory analysis 1a, child behavior was significantly related to maternal adjustment (such that more severe behavior is correlated to poor role adjustment). Specifically, attributions of globality and stability and uncontrollability were positively related to poor role adjustment.

The third step was to examine whether maternal attributions are related to maternal adjustment (hypothesis 2). This was tested in hypothesis 2. The results were that greater stability and globality were found to be associated with greater maternal role stress and lower maternal role satisfaction (refer back to Table 41). The findings were strongest (size of correlation and p-value) when using the PSI Total Stress score as outcome measure. No significant relations were found between attributions of controllability and locus and role adjustment.

The final step (exploratory analysis 3b) in testing mediation was to examine whether the relation between child behavior and maternal adjustment became non-significant (full mediation) or became less significant with a decrease in the magnitude of the correlation (partial mediation). Because the findings in the first three steps were strongest when using the PSI as an outcome measure and the WAQ as attribution measure, the mediation model was tested using only the WAQ to measure globality and stability predicting role adjustment as measured by the PSI Total Stress score.

As shown in Table 59, attributions were not found to mediate the relation between child behavior and maternal role adjustment. Although the magnitude of the correlation between child behavior and role adjustment decreased slightly, the attribution itself was not significant at step two (see model 2).

Table 59 Regression to test mediation of child behavior and maternal role adjustment by maternal attributions with dependent variable=PSI-SF Total Stress

	Predictor variable	Beta step 1	Beta step 2	Beta step 3	R ² Change Step 1	R ² Change Step 2	R ² Change Step 3
Model 1	Child Inattn	.20*	.16+	.16	.50***		
	Child Hyp	.17	.17	.20			
	Child Disobedient/ Oppositional	.42***	.39**	.42**			
	Globality about IO behavior		.02	.13		.01	
	Interaction term			-.08			.00
Model 2	Child Inattn	.20*	.18+	.18+	.50***		
	Child Hyp	.17	.17	.17			
	Child Disobedient/ Oppositional	.42***	.40***	.40**			
	Stability about IO behavior		.07	.06		.00	
	Interaction term			.01			.00
Model 3	Child Inattn	.20*	.16+	.16+	.50***		
	Child Hyp	.17	.17	.18			
	Child Disobedient/ Oppositional	.42***	.37**	.39**			
	Stability about ODD behavior		.14+	.15+		.01	
	Interaction term			-.04			.00

***p<.001, **p<.01, *p<.05, +p<.1

Results controlling for only behavior corresponding to attribution are shown in Appendix G. When only controlling for child behavior corresponding to attribution of interest, there appears to be a slight mediation effect. However, as shown from results in Table 59, the variance under consideration is better explained by co-occurring child behaviors. [Note that as shown in Tables 50 and 51 even when reaching diagnostic levels, diagnosis did partially mediate the relation between maternal attributions and adjustment]

CHAPTER 5 RESULTS FOR STUDY 2

Child Results

Exploratory Analysis 4: Child attributions

Child attributions about their own disruptive behaviors were expected to differ by diagnostic status and be correlated with severity of own behaviors

Exploratory Analysis 4a: Differences by diagnostic group

Children with ADHD made attributions about Oppositional and Prosocial behaviors that were more controllable compared to children without ADHD. They also attributed Inattentive/Overactive behaviors to more internal causes.

Table 60 Test of differences in attributions made by children with ADHD diagnosis versus children without a behavioral disorder, using the WAQ and Hoza measures

	Control	ADHD any type	F statistic (df)	P value	Value on attrib measure	Attributions about ADHD group in comparison to control
WAQ IO globality	2.3 (.9)	3.4 (1.0)	F(1,78)=.30	n.s.	1=specific 5=global	
WAQ IO locus	2.7 (.8)	3.1 (.8)	F(1,78)=5.0	P<.05	1=external 5=internal	ADHD more internal
WAQ IO control	3.4 (.5)	3.3 (.6)	F(1,78)=1.5	n.s.	1=uncontrollable 5=controllable	
WAQ OPP globality	2.0 (1.0)	2.2 (1.2)	F(1,78)=.7	n.s.	1=specific 5=global	
WAQ OPP locus	3.4 (1.0)	3.2 (1.2)	F(1,78)=.3	n.s.	1=external 5=internal	
WAQ OPP control	4.2 (.7)	3.7 (1.1)	F(1,78)=5.3	P<.05	1=uncontrollable 5=controllable	ADHD less controllable
WAQ Positive globality	3.9 (1.1)	3.5 (1.1)	F(1,78)=2.8	P<.1.	1=specific 5=global	
WAQ Positive locus	3.8 (.9)	3.9 (.9)	F(1,78)=.37	n.s.	1=external 5=internal	
WAQ Positive control	4.4 (.9)	3.7 (1.1)	F(1,78)=9.0	P<.01	1=uncontrollable 5=controllable	ADHD less controllable

*IO=Inattentive-Overactive type of behavior

*OPP=oppositional/disobedient type of behavior

Exploratory Prediction 4b: Child attributions and adult ratings of behavior.

Child attribution ratings of externality, stability, globality, and uncontrollability were expected to be related with greater severity of adult-rated child hyperactivity, inattention, and aggression (collapsed across child diagnostic groups). As shown in Table 61, child attributions were significantly related to mother and teachers' dimensional ratings of severity of child disruptive behaviors.

Table 61 Correlations between child attributions about child behavior in relation to mother and teacher ratings of child behaviors (3-factor analysis) (2-tailed)

	Mom rating of child Inattention	Mom rating of child hyperactivity	Mom rating of child OPP/disobedient Behavior	Teacher rating of child Inattention	Teacher rating of child Hyperactivity	Teacher rating of child OPP/disobedient Behavior
WAQ IO globality	.18+	.03	.03	.10	.08	.11
WAQ IO locus	.22	.27**	.22*	.21*	.17	.11
WAQ IO control	-.28**	-.21*	-.16	-.20+	-.20*	-.18+
WAQ OPP globality	.26**	.18*	.16+	.03	.16	.09
WAQ OPP locus	-.13	-.05	.01	-.09	-.11	.02
WAQ OPP control	-.26**	-.20*	-.11	-.23*	-.26*	-.18+
WAQ Positive globality	.13	.01	.01	-.09	-.13	-.19
WAQ Positive locus	.01	.09	.02	-.05	.01	.01
WAQ Positive control	-.33***	-.08	.00	-.24*	-.07	.00

***p<.001, **p<.01, *p<.05, +p<.1

Table 62: Correlations between child attributions about child behavior in relation to mother and teacher ratings of child behaviors (3-factor analysis) (1-tailed)

	Mom rating of child Inattention	Mom rating of child hyperactivity	Mom rating of child OPP/disobedient Behavior	Teacher rating of child Inattention	Teacher rating of child Hyperactivity	Teacher rating of child OPP/disobedient Behavior
WAQ IO globality	.18*	.03	.03	.10	.08	.11
WAQ IO locus	.22**	.27**	.22**	.21*	.17*	.11
WAQ IO control	-.28**	-.21*	-.16*	-.20*	-.20*	-.18*
WAQ OPP globality	.26**	.18*	.16*	.03	.16+	.09
WAQ OPP locus	-.13+	-.05	.01	-.09	-.11	.02
WAQ OPP control	-.26**	-.20*	-.11	-.23*	-.26**	-.18*
WAQ Positive globality	.03	.01	.01	-.09	-.13	-.19*
WAQ Positive locus	.01	.09	.02	-.05	.01	.01
WAQ Positive control	-.33***	-.08	.00	-.24**	-.07	.00

***p<.001, **p<.01, *p<.05, +p<.1

Subtype Comparisons

When testing for group differences considering ADHD subtype, a significant result was found for child attributions of locus pertaining to oppositional/disobedient behaviors and for control pertaining to Oppositional behavior (see Table 63).

Specifically, children with ADHD-Combined type made attributions that Inattentive/Overactive behaviors were more internal compared to their peers without ADHD. Additionally, children with ADHD-Combined type attribute oppositional/disobedient behaviors to less controllable causes than children with ADD-Inattentive type or than children without ADHD.

Table 63 Results of child attributions, testing for group differences when comparing the independent variable of child diagnosis with four levels (ADHD-C, ADD, subthreshold, and controls), dependent variable=attribution domain by behavior type

	Control	a ADHD- Combined	b ADD - Inattentive	C Sub- threshold ADHD	F stat (df)	p- value	Value on attrib measure	Conclusions
WAQ IO globality	2.3 (.9)	2.4 (1.0)	2.3 (.9)	2.2 (.9)	F(3,109) =.20	n.s.	1=specific 5=global	
WAQ IO locus	2.7 ^a (.8)	3.3 ^a (.7)	2.7 (.8)	2.9 (.6)	F(3,109) =4.2	P<.01	1=external 5=internal	ADHD-C attribution behaviors to more internal factors Differ btwn ADHD-C and add was p=.055
WAQ IO control	3.4 (.5)	3.3 (.6)	3.3 (.5)	3.2 (.6)	F(3,109) =1.1	n.s.	1=uncontrolla ble 5=controllable	
WAQ OPP globality	2.0 (1.0)	2.3 (1.3)	2.0 (.9)	2.1 (1.1)	F(3,109) =.7	n.s.	1=specific 5=global	
WAQ OPP locus	3.4 (1.0)	3.1 (1.3)	3.5 (1.0)	3.5 (.8)	F(3,109) =.7	n.s.	1=external 5=internal	
WAQ OPP control	4.2 ^{ad} (.7)	3.5 ^a (1.1)	4.4 ^d (.7)	3.9 (.9)	F(3,109) =4.8	P<.01	1=uncontrolla ble 5=controllable	ADHD-C attributed behaviors to less controllable causes than controls or ADD children
WAQ Positive globality	3.9 (1.1)	3.5 (1.1)	3.7 (.9)	3.7 (1.3)	F(3,109) =.9	n.s.	1=specific 5=global	
WAQ Positive locus	3.8 (.9)	4.0 (.9)	3.9 (.9)	3.8 (.8)	F(3,109) =.2	n.s.	1=external 5=internal	
WAQ Positive control	4.4 (.9)	3.7 (1.0)	3.5 (1.5)	3.8 (1.2)	F(3,109) =3.1	P<.05 (p=.0 28)	1=uncontrolla ble 5=controllable	ADHD-C and controls p=.07 ADHD-C and ADD p=.099

*IO=Inattentive-Overactive type of behavior; *OPP=oppositional/disobedient type of behavior

a indicates significant difference between control and adhd combined groups

b indicates significant difference between control and add inattentive groups

c indicates significant difference between control and "subthreshold" groups

d indicates significant difference between adhd and add group

e indicates significant differences between add and subthreshold groups

f indicate significant difference between adhd and "subthreshold groups

Table 64 Correlations between mother and child attributions about child behaviors

	Child WAQ IO globality	Child WAQ IO locus	Child WAQ IO control	Child WAQ OPP globality	Child WAQ OPP locus	Child WAQ OPP control	Child WAQ Positive globality	Child WAQ Positive locus	Child WAQ Positive control
Maternal WAQ IO stability	.15	.18+	.02	.20*	-.04	-.11	.05	-.01	-.18
Maternal WAQ IO globality	.08	.16+	-.06	.19*	-.07	-.03	.06	.14	-.12
Maternal WAQ IO locus	-.05	.08	-.06	-.11	.05	.01	.06	.03	-.06
Maternal WAQ IO control	.00	.09	.03	-.12	.06	.15	-.03	.06	.12
Maternal WAQ OPP stability	.12	.19*	.01	.15	-.14	-.14	-.03	-.06	-.10
Maternal WAQ OPP locus	.05	.10	.05	-.07	.06	.16+	.21*	.01	.09
Maternal WAQ OPP control	.00	.11	.05	-.07	.06	.18+	.05	.03	.17
Maternal WAQ Positive stability	.12	.19*	.01	.14	-.14	-.14	-.03	-.06	-.10
Maternal WAQ Positive globality	.16+	.10	-.06	.22*	-.16	-.02	-.06	.10	-.15
Maternal WAQ Positive locus	.05	.10	.05	-.07	.06	.16+	.22*	.01	.10
Maternal WAQ Positive control	.00	.11	.03	-.09	.08	.18+	.05	.03	.17

CHAPTER 6 DISCUSSION

The current study had three over-arching objectives: (1) extend knowledge regarding maternal attributions about child disruptive behaviors in an ADHD population, (2) examine specific maternal attributions about children's disruptive behaviors in relation to maternal role adjustment, (including examining possible pathways of which attributions may play a role in maternal adjustment), and (3) explore child attributions about disruptive child behaviors. The child portion of the study was exploratory. In fact, one of the endeavors of assessing child attributions was to create a child version of Johnston's (Johnston et al., 2000; Johnston & Freeman, 1997) Written Analogue Questionnaire. Results pertaining to child attributions are discussed last.

Several points are worth noting about the findings reported here. First, a number of findings from the initial studies of attributions made by mothers of children with ADHD were replicated, suggesting the robustness of these effects, whereas other key past findings did not replicate. In particular, attributions of stability and globality consistently differed by diagnostic group, replicating prior study findings. Secondly, maternal attributions were related to maternal adjustment, with stability about disobedient behaviors emerging as an important factor even when child behaviors were controlled. Thirdly, the relation between maternal attributions and their adjustment was moderated at least partially by child diagnosis when considering attributions about child inattentive-overactive but not disobedient behaviors. These main findings will be discussed in turn, before considering the child findings and limitations of the study.

Understanding the differences in attributions made by mothers of children with ADHD versus mothers of children without ADHD lays the groundwork for examining

the different possible functions that maternal attributions about child behaviors serve in relation to maternal adjustment. If, as the current findings suggest, mothers of children with ADHD make attributions about their children's behaviors that differ from those of other parents, these attributions may have implications for maternal affective and behavioral responses to their children's behavior (Dix & Grusec, 1985; Weiner, 1980). The implications for the effects of maternal attributions on their adjustment are multifold. For example, mother's beliefs and attributions may affect the standards and challenges that they present to their children as well as their expectations and consequential support or encouragement to perform relevant behaviors. Learned helplessness is characterized both by attributions of stability, globality, internality, and uncontrollability and by depressed affect and relinquishment of purposely effective activity (Peterson, 1988). The pattern of attributions⁸ made by mothers of children with ADHD mirrors this depressive or "pessimistic attributional style."

A pessimistic attributional style contrasts with "positive reframing," a cognitive way of thinking about problems that is associated with positive adjustment to problems in individuals (Peterson, 1988) and in families (McCubbin & Patterson, 1983; Podolski & Nigg, 2001). Intriguingly, one researcher has found some evidence to indicate that the pattern of attributions normally associated with poor adjustment may be associated with better adjustment in children with ADHD (Milich & Okazaki, 1991). It is similarly

⁸ footnote: Literature pertaining to learned helplessness considered the individual's attributions of internality and controllability in reference to that individual. In the current study, attributions made by mothers pertained to whether or not the mother saw that child's behavior as internal to the child or within the child's control rather than within the mother's control.

possible that the pattern of attributions normally associated with poor adjustment may serve a different function in mothers of children with ADHD.

Notably, in initial studies the pattern of attributions made by mothers of children with ADHD differed from those attributions made by mothers of children without ADHD (Johnston & Freeman, 1997; Sobol, et al., 1989). Interestingly, this pattern differed from that which has been related to poor parental adjustment. This posed a curious conundrum for researchers of parent attributions and adjustment because parents of children with ADHD consistently report higher levels of distress compared to their counterparts. Do attributions operate differently in parents who have a child with ADHD or were the initial findings pertaining to differences between mothers of children with and without ADHD unstable or unreliable findings? Replication of the group differences was thus clearly in order.

Replication of Group Effects

Maternal attributions have recently been suggested as an important process and family context variable in families where a child has ADHD (Johnston & Mash, 2001; Wright et al., 2000). Despite long-standing support for the importance of attributions in the general coping and social cognitive literatures, few studies have examined attributions in families where a member has ADHD. However, two laboratories: one in Canada (Johnston & Freeman, 1997; Johnston & Mash, 2001) and one in the U.S. (Hoza et al., 2000) have begun to explore maternal attributions in child ADHD. Johnston's work pointed to the importance of examining relations between maternal attributions and maternal adjustment in parents of children with ADHD. Hoza and colleagues (2000)

provided an initial look into testing that relation although it was not a focal point of her work.

Because maternal attributions about children's behaviors have only recently been studied in ADHD samples, the initial findings are at a stage where replication is crucial. Thus, the first analyses of the current study attempted to replicate those findings. Replicating Johnston's findings (Johnston & Freeman, 1997; Johnston, Reynolds, Freeman, & Geller, 1998), the current study found that mothers of children with ADHD (any subtype) made more stable, global, and uncontrollable attributions about child disruptive behaviors compared to mothers of children without ADHD. The replication of this finding is significant and meaningful.

Attributions that child disruptive behaviors are stable, global, and uncontrollable are consistent with the diagnosis of ADHD. This consistency with criteria for ADHD indicates a concordance between maternal attributions, diagnostic criteria, and child behavior. Diagnostic criteria for ADHD requires that the child's disruptive behavior be present for at least 6 months, a criterion consistent with the attribution of stability. To meet criteria for ADHD, a child's behavior must also occur across setting; a criterion consistent with attributions of globality. Also, the degree of behavior must be "maladaptive and inconsistent with developmental level," a factor which indicates that the child's behavior is beyond normal levels and uncontrollable by normal parenting behaviors. Thus, the pattern of attributions endorsed by mothers of children with ADHD is consistent with diagnostic criteria for ADHD. Further, the attributions are associated with increases in child disruptive behaviors as evidenced by correlations between

maternal attributions and both mother and teacher ratings of child behavior. Thus, mothers' attributions appear consistent with the realities of parenting a child with ADHD.

This consistency between attributions made by mothers of children with ADHD and the realities of the disorder might arguably be explained by the fact that mothers know their child's diagnosis. That is, while these attributions are consistent with a diagnosis of ADHD, one might wonder if the diagnosis itself causally determined maternal attributions. Certainly most children in the current study had a prior diagnosis. Knowledge about ADHD and ADHD diagnosis certainly would be expected to affect maternal attributions; however, the role of this in the current study was not directly assessed. Although this issue was not a direct target of the study, group differences in maternal beliefs about their child's ADHD diagnosis were examined. Twenty-nine mothers had a belief about their child's diagnosis that differed from the actual child diagnosis established by the assessment protocol in this study. Results differed only slightly when examining beliefs compared to results when grouping mothers based on "actual" child diagnosis established in the study. Thus, beliefs about diagnosis apparently played at most a small role in the effects noted here. Yet, clearly this issues warrants more extended follow up investigation.

Additionally, one might argue that child's actual behavior accounted fully for attribution results; however, the analyses that examined attributions in relation to maternal adjustment suggest that attributions play an important role in these families even when controlling for actual child behavior (here, as rated by mothers and by teachers). For example, mediation analyses revealed that maternal stability and globality attributions about oppositional behaviors were linked to maternal adjustment even when

controlling for child behavior. Additionally, moderation analyses revealed that for stability attributions about inattentive/overactive behaviors were differentially related to maternal adjustment for mothers of children with and without ADHD. Attributions of stability were related to maternal stress for mothers of children with ADHD but not for mothers of children without ADHD. These data suggest attributions play an important role in maternal adjustment.

Notably, the primary results in the current study pertaining to controllability were maternal attributions about whether or not the child could control his/her own behavior. Some additional exploratory analyses indicated that maternal attributions about her own responsibility and ability to control her child's behavior also differed by diagnostic group. The reliability of these findings warrants replication; effects in the current study were small. This was not a focus of the current study so no conclusions are drawn here other than to note that consideration of both child and parental control of the child's behavior is worth study. Attributions that the child's behavior is uncontrollable by child and by parent are consistent with the diagnosis of ADHD. Implications of such attributions are complicated as will be discussed further in section on implications of the findings.

One finding that was in contrast to Johnston's research (Johnston & Freeman, 1997) and to hypotheses was that no significant group differences were found on the domain of locus in the omnibus analyses for ADHD combined type. (Two significant differences were found on locus when analyses data by subtype but this was a difference between ADD-inattentive type and subthreshold groups, to be discussed later in section on subtype findings). Thus, the current study did not replicate Johnston's work that

mothers of children with ADHD differed in their locus attributions compared to mothers of non-disordered children⁹.

Although Johnston (Johnston & Freeman, 1997) found maternal attributions of locus differed by child diagnosis, even in her studies, the locus finding was not consistent across measures. Indeed, the locus dimension may be one of the more difficult attribution judgments for mothers to make. If mothers ascribe to a biogenetic view of ADHD, one would expect attributions of internal locus as Johnston has found. However, internal locus attributions in some ways might appear to “blame” the child. Given the uncontrollable nature of ADHD, the internal locus attribution may be challenging for some parents to make. One would expect that if mothers ascribe to a biogenetic view of ADHD that they would attribute the causes of their child’s Inattentive-Overactive behaviors as internal and as inconsistent with external locus or environmental explanations of the behavior. Two possibilities are that mothers are attempting to avoid blaming their child for this biogenetic disorder or that the parents are thinking about the inevitable variability across situations even while the child’s behavior is largely internally caused. That is, even children with ADHD show variability in their behavior across activities, suggesting some interaction with environment. These interpretations are purely speculative. The lack of the locus finding across measures is puzzling.

A possible explanation for the null finding was that medication status was masking an effect. Johnston and colleagues (2000) had found that maternal attributions for child behaviors when the child was medicated were opposite of those attributions made when the child was not medicated. Given that finding, a check on the current study

⁹ Johnston & Freeman (1997) found the locus effect using the RII but not with the WAQ. The locus effect was not significant in the current study with either the WAQ or RII.

findings was to control for medication (in case medication status had cancelled out an effect). However, even with medication status controlled, the current study did not find a difference in locus attributions made by mothers of children with and without ADHD. Although no effect was found when controlling for medication status, it is worth noting that when children take medication, medication serves as an external substance that controls the internal biological causal components of the child's ADHD. Thus, if parents consider such possible effects of medication, they might attribute remaining disruptive behaviors (not controlled by the medication) to external factors in the environment. Given the prevailing biogenetic view of ADHD and predominant treatment by medication, the complexity of these issues is important to note when considering attributions about ADHD. These issues may have contributed to the null locus findings in the current study. In the current study, a primary and likely explanation for the null finding is measurement error. Notably, the reliabilities of the locus measures in the current study were poor. Further examination of locus pertaining to child ADHD behaviors along with study on measurement of locus attributions is warranted before conclusions can be drawn.

Issues pertaining to child medication, beliefs about medication, and maternal attributions were not the focus of the current study but nonetheless warrant noting. Indeed, early studies pertaining to attributions in relation to ADHD revolved around beliefs about medication (see review by Henker & Whalen, 1991). In recent studies (Johnston, Fine, Weiss, Weiss, et al., 2000), maternal attributions about their child's disruptive behaviors indeed differed when mothers rated their child's behavior when the child was on versus off medication. When on medication, behaviors were rated as more

externally controlled, possibly due to the medication as an external factor but also that the medication may have controlled any internal factors, leaving external factors to contribute to any disruptive behavior while the child was on medication. Certainly, medication status contributes to maternal attributions. Even though no effect for medication status was found in the current sample, additional research in this area is warranted. Another consideration is whether maternal attributions affect maternal decisions regarding whether or not to use medication. Again, the current study did not address this but further studies might illuminate further the multiple relations between medication status, child behaviors, parent attributions, treatment decisions, and parents' affective and behavioral responses to a child's ADHD.

A finding which differed from what was expected but which provides some room for speculation is that when considering differences in attributions made by mothers of children with and without ADHD, the group differences were found in relation not only to children's ADHD behaviors but also in relation to children's Oppositional and Disobedient and Positive/Prosocial behaviors. The similarity in maternal ratings of children's Oppositional/Disobedient and ADHD behaviors could be important with implications for parent stress and adjustment. Children with ADHD often but not always exhibit co-morbid disruptive behaviors. While impulse control and sensation seeking (biogenetic and temperament factors) likely play an important role in this link (Waldman, Rhee, Levy, & Hay, 2001), maternal adjustment and parenting response also are likely important factors (as suggested by twin studies indicating that shared environment effects contribute to comorbid presentations (Rhee, Waldman, Hay, & Levy, 1999; Waldman, Rhee, Levy, & Hay, 2001)). As outlined in the literature review, maternal stress has been

causally linked to the development of aggression in children (related to child oppositional behaviors; Patterson, 1996) and has been linked to the exacerbation and maintenance of ADHD behaviors (Hinshaw, 1994). The similarity in rating of child oppositional/disobedient and ADHD behavior may be one important mechanism by which maternal stress occurs and co-morbid child aggression is promoted. Maternal ratings of child ADHD behaviors may be influenced by their ratings of aggressive behaviors (a negative halo effect) or ADHD behaviors may be construed as oppositional/disobedient – a set of behaviors usually associated with intentionality and control. Similarly, children with comorbid problems could be driving a more despairing pattern of attributions by which the attribution style is linked to poor adjustment in mothers.

In order to consider effects of aggressive behaviors, analyses were run controlling for aggressive behavior. When controlling for such comorbid child problems, only the controllability rating was different for mothers of children with and without ADHD. This suggests that the controllability of child behaviors is indeed seen differently by mothers of children with ADHD versus without ADHD and that this difference is not driven by comorbid child aggressive and oppositional behaviors or maternal ratings of such comorbid behavior. When controlling for child aggressive behaviors, group differences between maternal ratings of stability and globality of ADHD behaviors did not remain significant. Thus, maternal ratings of stability and globality of ADHD and noncompliant behaviors may be confounded with each other. Other research has indicated that parents and teachers often rate children at exhibiting hyperactive behaviors if they child exhibits aggressive behavior (Abikoff, Courtney, Pelham, & Koplewicz,

1993; Schachar, Sandberg, & Rutter, 1986). The current study results indicate that differences in maternal ratings of stability and globality are affected by co-occurring child aggressive behavior.

Attributions of stability and globality of ADHD behaviors are consistent with diagnostic criteria for ADHD. Their lack of independence when considering comorbid aggressive/oppositional behaviors indicates that understanding attributions about ADHD should not be examined without considering the effects of co-occurring aggression. Notably, childhood aggression is highly correlated with child ADHD and is associated with poor child outcome (Barkely, 1998) as well as with maternal stress (Podolski & Nigg, 2001). If ADHD behaviors are considered stable and global only when the child also experiences comorbid aggression, then it is the comorbid aggression that needs to be primary for intervention. However, delineating for parents the separate but co-occurring effects of child ADHD and child aggression may be important for helping parents better understand their children's ADHD behaviors. Further discussion of globality and stability findings are included in the section pertaining to maternal role adjustment.

Another similarity in ratings across behaviors was found. Like Johnston (Freeman, Johnston, & Barth, 1997; Johnston & Freeman, 1997), the current study found that attributions made by mothers of children with ADHD were largely similar across behavior type not only when examining different types of disruptive behaviors (ADHD and disobedience) but also when examining positive/prosocial behaviors. Both in the current study and in Johnston's study, the patterns of attributions were similar across all three behavior types¹⁰. Johnston specifically found that mothers of children with ADHD

¹⁰ The current study did examine whether the ratings across behavior type were statistically similar or different; however, the pattern of attributions was the same across behavior type.

did not differentiate among the behavior types when making attributions of locus and stability but did differentiate in terms of attributions of controllability. In contrast, parents of children without ADHD did distinguish on all behavioral dimensions (Johnston & Freeman, 1997) and exhibited a “child-serving bias” by rating positive behaviors as more stable and global and negative behaviors as less stable and global (Johnston & Freeman, 1997, p. 644). Thus, they concluded that parents of children with ADHD showed “less of a general child-serving bias” (Johnston & Freeman, 1997, p.644) by not differentiating across behavior types and giving children more credit for positive behaviors.

The current finding that mothers of children with ADHD attributed positive behaviors to stable factors contrasts in part with Johnston and Freeman’s (1997) conclusion that parents of children with ADHD attribute *positive* behaviors to *less* dispositional factors than their counterparts. Johnston’s finding is indeed consistent with parental negativity toward their children (in a sense giving children less “credit” for their positive behavior). The current findings that mothers of children with ADHD rated positive behaviors as more stable and global compared to ratings made by mothers of children without ADHD contrast with this conclusion. It is possible that in the current sample these ratings were either more adaptive for mothers (see discussion subsequently) or that ratings were influenced by a positive “halo effect” in which ratings of one behavior affected ratings of all other behaviors. To clarify, both the current study and Johnston’s found both groups of mothers rated children’s positive behaviors as more stable than unstable but which ratings were higher differed in the two studies. That is, in the current study the stability ratings of positive behaviors were significantly higher for

mothers of ADHD children whereas in Johnston's study the stability ratings were higher for mothers of children without ADHD.

The similarity in the pattern of attributions across behavior types is somewhat puzzling. There are several possibilities for explaining this effect. First, ratings of one behavior may have influenced ratings of others behaviors, producing a "halo effect." This effect could be a "child-serving bias" if positive as well as negative behaviors were seen as stable as found in the current study (although the similarity between ratings of ADHD and aggression complicates this interpretation). However, in contrast to current study findings, Johnston (Johnston & Freeman, 1997) found that parents of children without ADHD did distinguish their ratings by behavior type. Further, even though parents of children with ADHD rated positive behaviors as stable (in Johnston's as well as the current study), in Johnston's work, the magnitude of those stability ratings were greater for parents of children without ADHD. Certainly, a positive "child-serving" bias would be beneficial for parents of children with ADHD who are faced with daily stressors associated with their children's behavior. As will be discussed later, the hope in the current study was that the examination of attributions in relation to mother's adjustment might help elucidate the function of these different attributional patterns. However, before directly examining attributions in relation to adjustment, one additional concept was explored. Beliefs and expectancies are an important part of maternal attributions and the biases they may hold for or about their children; thus, beliefs about child diagnosis was examined in relation to attributions.

Maternal Attributions and Belief About Child's Diagnosis

Because attributions are a part of a belief system, analyses examined whether maternal attributions differed by maternal *belief* about child's ADHD diagnosis (rather than actual ADHD diagnostic status of the child). The results for beliefs about child diagnosis mostly corresponded with results for actual diagnosis. That is, mothers who believed their children to have ADHD (whether or not this was true) also attributed their children's disruptive behavior to more stable, global, and uncontrollable factors. However, an interesting new finding was that the pattern of results for attributions about positive/prosocial behaviors when using maternal beliefs about diagnosis replicated Johnston's group differences (in contrast to the "positive halo effect")

For the belief data, results for maternal ratings of positive behaviors differed when separating mothers by beliefs about diagnosis versus by actual child diagnosis. Mothers who believed their child to have ADHD were less likely to see their child's positive behavior as global, consistent with the "negative bias" suggested by Johnston's research. This finding is interesting and supports the argument that there is more of negative than positive halo effect in the attributions of mothers of children with ADHD. Further research is needed for clarification of these findings but notably, beliefs about ADHD diagnosis appeared to be important to consider.

ADHD DSM-IV Subtype Differences in Attributions

One way in which the current study began to expand our knowledge about ADHD was through the analyses of differences in maternal attributions about child misbehaviors based on DSM-IV ADHD subtype. Indeed, this was the first study to do so, in analyses

looking at ADHD-combined type, ADD-Inattentive type, as well as subthreshold ADHD symptomatology. As might be expected, group effects were frequently but not exclusively driven by differences between ADHD-Combined subtype and controls. Research consistently has indicated that this syndrome, which includes extensive hyperactive symptomatology is more noticeable and disruptive to parents and others in the child's life than simply inattentive behaviors (Barkley, 1998; Schachar, Sandberg, & Rutter, 1983). It is the child's disruptive behaviors that are most obvious and that frequently interfere with the plans that others in the child's life have. Interestingly, the role of inattentive behaviors is likely often overlooked or minimized by people in the child's life (Barkley, 1998). Similarly, hyperactive behaviors may be seen as more purposefully and may be more likely to be confused with oppositional/aggressive behaviors (Abikoff et al., 1993; Schachar, Sandberg, & Rutter, 1983).

Attributions made by mothers of children with ADD-Inattentive subtype did not differ from attributions made by mothers of children without ADHD but did differ from those made by mothers of children with ADHD-C. Thus, in general, mothers of children with ADD-Inattentive subtype did not endorse an abnormal or unique attributional style compared to mothers of control children. Thus, when a child has ADD-Inattentive subtype, mothers' attributions are very much like those attributions made when considering a non-disordered child. Again, this data suggests that the child more overtly disruptive behaviors (hyperactive and oppositional) may be more noticeable to mothers and thought about differently. Notably, analyses did not examine whether attributions differed between attributions about Inattentive versus attributions about Overactive behaviors; an area where future research might clarify further the role of attributions in

relation to the various behaviors associated with ADHD, most particularly distinguishing between inattentive and hyperactive symptomatology

Maternal Attributions and Role Adjustment

A major objective of the current study was to examine maternal attributions in relation to maternal adjustment. This is important with regard to models of family process in the maintenance of ADHD problems over time as well as to potential insights into interventions aimed at ameliorating parent stress. No prior known studies with mothers of children with ADHD focused directly on maternal attributions about disruptive behaviors in relation to maternal adjustment. One study examined attributions about ADHD behaviors and adjustment but was in a convenience sample through a mail survey (Geller & Johnston, 1995). Another study (Hoza et al., 2000) measured attributions and also adjustment factors but not as a primary focus of the study. Thus, this was one of the first major studies of maternal adjustment in relation to maternal attributions.

A large body of literature suggests that beliefs and attributions are related to adjustment (Lazarus & Folkman, 1984; Podolski & Nigg, 2001; Thompson, et al, 1992). Thus, it was not surprising to find that maternal attributions about children's behaviors were indeed related to mothers' role stress. Of more interest was the specific pattern of these attributions. Based on the general parent attribution literature (Dix & Grusec, 1985), it was hypothesized that maternal attributions of internality, stability, globality, and controllability about child disruptive behaviors would be related to high levels of maternal distress (and low levels of role satisfaction).

The first finding with regard to that pattern was that stability and globality were the most consistent predictors of adjustment (when using teacher as well as maternal ratings of child behaviors). This finding echoes the literature; that is, stability and globality factors are the most consistent factors to be related to adjustment both in the general literature (Bunce & Peterson, 1997) and in the parent attribution literature (Dix & Grusec, 1985; Johnston & Freeman, 1997). Within the learned helplessness literature, Peterson has recently argued for a two-dimensional model of “pessimistic” attributions with the global/stable factor accounting for the most variance in relation to well-being (Bunce & Peterson, 1997). Certainly, the stability and globality factors have been related to poor adjustment in studies with general population samples (Bunce & Peterson, 1997) and parents (Dix & Grusec, 1985).

The emergence of stability and globality as robust attributions related to maternal adjustment suggests that it is the perceived pervasiveness of child disruptive behaviors that wears on parents rather than the factors related to whether or not the child could change the behavior (locus and control). This finding makes sense within a longitudinal or family development framework. Studies of coping in parents have found that over time there is a build up of stressors such that parents need to adopt additional means of coping (McCubbin & Patterson, 1983; Thompson & Gustafson, 1996). Given the chronic nature of ADHD and that medication only has short-term benefits, understanding factors which may build up over time may prove essential to effective interventions for children and their parents. In addition to the stability of the child’s behavior, the globality or pervasiveness of that behavior means that parents do not receive reprieve from dealing with their children’s disruptive behaviors. It may be that

the use of medication may lessen maternal stress and thus have additional indirect consequences for child adjustment as well.

The relation between attributions of stability and adjustment was particularly robust for attributions pertaining to oppositional/disobedient behaviors. That is, maternal attributions about oppositional/disobedient behaviors were related to maternal adjustment even when controlling for child behaviors. The unique contribution of maternal attributions to maternal adjustment supports the importance of maternal attributions in understand adjustment to a child's ADHD. As outlined earlier, maternal stress plays a significant role in determining parenting behavior (Patterson, 1983). Mothers who experience higher levels of role specific or general stress are less likely to effectively monitor and discipline their children. Consequential poor and coercive parenting ensues leading to the development of aggressive behavior. Notably, in the current study, the independent relation to maternal adjustment occurred only when considering attributions about oppositional/disobedient behaviors not when considering attributions about inattentive/overactive behaviors. In contrast, the relation between attributions about inattentive/overactive behaviors and maternal *role specific stress* was fully mediated by child behaviors. This indicates that attributions pertaining to oppositional behaviors may be of utmost importance to target in interventions. Despite this pattern of results, further study of the role of attributions about inattentive/overactive behaviors is warranted, particularly, when considering the high correlation between attributions about inattentive/overactive and attributions about oppositional/disobedient behaviors.

In contrast to the general robustness of the stability finding, locus and controllability were not significantly related to maternal adjustment in the current study.

The roles of locus and controllability have been less clear across prior studies as well. Yet attributions of controllability were hypothesized to be one of the crucial differentiating factors, distinguishing attributions made by mothers of children with and without ADHD. Within the developmental literature on parent attributions, Dix and Grusec (1985) found that controllable and internal attributions of behaviors are related to greater stress; however, this differs from what has been found as the attributional pattern made by mothers of children with ADHD (Johnston & Freeman, 1997). Given that mothers of children with ADHD experience greater levels of distress (Johnston & Mash, 2001; Podolski & Nigg, 2001) compared to mothers of children without disorders, the attribution pattern was expected to be moderated by diagnosis. That is, the relation between attributions and distress was expected to be different for mothers of children with and without ADHD.

Moderation of Attribution-Adjustment Relation by Diagnosis

One of the primary questions in the current study was whether the relation between maternal attributions about child disruptive behaviors and maternal adjustment would differ based on child diagnosis, particularly for attributions about controllability and locus pertaining to child ADHD and oppositional behaviors. Notably, there was some support for moderation by diagnosis when examining attributions of *stability*. Attributions that IO behaviors were stable were associated with higher *role stress* for mothers of children with ADHD but not for mothers of children without ADHD. In contrast, *maternal role satisfaction* was related to attributions about child ADHD and aggression for mothers of children without ADHD but not for mothers of children with

ADHD. The stability of ADHD behaviors was thus associated with a higher level of increased stress for mothers of children with ADHD than for mothers of control children. Mothers of children with ADHD are faced continuously with their children's disruptive behaviors that prove stressful each day. Mothers of children who do not have ADHD do not experience the same intensity, severity, or stability of inattentive/overactive behaviors; by definition, their children exhibit those behaviors less often and to a less severe degree. Thus, the findings in the current study are consistent with the literature on ADHD. Interestingly, the relation between attributions and role satisfaction was clearer for mothers of children without ADHD. It may be that these mothers do not expect such behaviors from their children and thus their presence is more distressing as such behaviors are to be less expected or explicable.

Globality findings were also of interest. Globality attributions pertaining to IO behaviors were related to lower levels of satisfaction with parenting performance, indicating the pervasiveness of the child's behaviors is problematic for parents. This finding corresponds to prior research on parent stress and coping with their child's ADHD (Cunningham, Bemness, & Siegel, 1988; Podolski & Nigg, 2001). Studies on social support have found that social support was negatively associated with parent adjustment in parents of children with ADHD. Cunningham, Bemness, and Seigel (1988) explained this in terms of the added stress that support systems can add when they disapprove or judge a parent.

Findings pertaining to attributions of stability were more complicated; specifically, the relation between stability attributions and adjustment was dependent on child diagnosis, type of behavior, and type of maternal adjustment under consideration.

Notably, while both mothers of children with and without ADHD reported high levels of stress when attributing IO behaviors to stable causes, the magnitude of this relation was constant for mothers of children with ADHD but increased for mothers of children without ADHD the more they attributed behaviors to stable causes. Mothers of children with ADHD may be at high enough level of stress that a type of ceiling effect is experienced. Alternatively, the diagnostic label of ADHD and the attributions associated with such a diagnosis may at times serve a protective function in terms of high levels of stress further increasing. Mothers of children without ADHD may exhibit a greater increase in role stress the more stable they see their child's IO behaviors partly because they are not expecting their children to act in Impulsive/Overactive ways. When considering IO stability attributions and role satisfaction, the relation was greater (larger magnitude and more significant) for mothers of children without ADHD. ADHD diagnosis may serve a protective function against role specific satisfaction as mothers understand the cause of their child's ADHD behavior as less related to their own parenting efforts.

Results pertaining to attributions regarding the stability of children's Oppositional/Disobedient behaviors showed a similar pattern. Attributions of stability of Oppositional behaviors were related to dissatisfaction with parenting performance in mothers of children without a behavior disorder but related to role stress in mothers of children with a behavior disorder. Thus, although attributions of stability and globality about IO and OPP behaviors are related to maternal adjustment, whether they are related to role satisfaction or role stress appears driven by child diagnosis. When children are in the pathological range, these attributions may protect against role dissatisfaction to which

all parents are vulnerable; however, these attributions do not appear to protect against the role stress generally found to be higher for parents of children with disorders.

Although locus and control attributions were expected to be related to maternal adjustment, the current study did not find such relations. The lack of findings was not surprising given possible confounds with medication status and given measurement limitations. Measure limitations warrant additional investigation before conclusions are made.

Diagnostic versus dimensional considerations

Attention Deficit Hyperactivity Disorder is a diagnosis based on number of symptoms reaching a threshold of clinical severity. Notably, while some psychologists argue for a clearly defined syndrome based on clinical cutoffs (Searight, Nahlik, & Campbell, 1995), sophisticated studies indicate that whether or not ADHD is in fact a categorical rather than dimensional phenomenon remains unclear (see Nigg & Goldsmith, 1998), with some evidence suggesting it may represent an extreme on a continuum of normal behaviors. The current study supports the importance of considering both dimensional and categorical factors associated with ADHD and familial adjustment to child attention problems. Dimensional analyses revealed that subthreshold ADHD symptoms may prove stressful for mothers. Further, in examining the relation between attributions and adjustment, severity of child behaviors mediated the relation between maternal attributions about IO but not ODD behaviors. In this way, dimensional consideration of child ADHD behaviors is important for a complete understanding of contextual family factors. Diagnosis of ADHD was found to moderate the relation between attributions about ODD behaviors and maternal adjustment, thus indicating that

diagnostic considerations are also important to consider in terms of maternal adjustment as well. Thus, the current study results support the comprehensive approach of examining child problems from both continuous, dimensional as well as categorical, diagnostic perspectives (Jensen, Koretz, Locke, et al., 1993).

ADHD Subtype Differences in Attribution - Adjustment Relation

As with the attribution by group analyses, subtype analyses of the attribution-adjustment relation indicated that results were often driven by differences between mothers of children with ADHD-C and controls. Relations between attributions and adjustment were not significant for mothers of children with ADD-inattentive subtype. Interestingly, subtype analyses revealed that for mothers of children with ADHD-C subtype, attributions of high internal locus for positive traits was related to parent satisfaction and less stress; high internal locus for oppositional behaviors was related to parent dissatisfaction and greater stress. Thus, *attributions of locus* did appear related to adjustment but only for mothers of children with ADHD-Combined type and only when considering Oppositional/Disobedient or positive behaviors.

Summary of Maternal Attribution Findings

In summary, the current study replicated prior research that mothers of children with ADHD attribute their children's disruptive behaviors to more stable, more global, and less controllable causes. The study furthered the literature by examining subtype differences and finding that indeed subtypes of ADHD are important when understanding the role of attributions, especially in relation to maternal adjustment. Attributions of

stability and globality were consistently related to maternal adjustment whereas attributions pertaining to controllability and locus were not. Notably, the relation between maternal attributions and adjustment differed for diagnostic group. While attributions of stability and globality of behaviors were related to adjustment in both groups of mothers, these attributions were related to *less* role specific satisfaction in mothers of control children and with *greater* stress in mothers of children with ADHD. This suggests that stability and globality attributions about IO behaviors, attributions that are consistent with an ADHD diagnosis, may provide some relief to mothers of children with ADHD in terms of role specific stress and self-blame but that these attributions do not buffer mothers from the general stress caused by their child's ADHD behaviors.

Possible Implications Pertaining to Intervention Research

In addition to simply understanding the role of maternal attributions in relation to maternal role adjustment, one aim of the current research is to contribute to the effectiveness of interventions. Research has shown that how parents think about their children's behavior affects treatment decisions and adherence to treatments (Wright et al., 2000). Because few studies have examined parent attributions about ADHD, the current study findings were an initial foray into this arena. Similarly, few studies have examined parent attributions about ADHD in relation to treatment decisions; however, the initial studies that examine such notions suggest that parent attributions may play an important role in treatment decisions and adherence (Reimers et al., 1995). Reimers and colleagues (1995) examined attributions related to physical versus environmental causes of children's behavioral problems, finding that attributions to physical causes were

associated with a decrease in parental perception of acceptability of behavioral treatments. Reimer's study would suggest that attributions that correspond to a biogenetic model of ADHD would be associated with decreased parental interest in behavioral treatments. The current study cannot address the relation between parent attributions and treatment decisions; however, findings suggest that ADHD behaviors are viewed as stable and global and hence consistent with a biogenetic model of ADHD. The findings pertaining to locus and control are inconclusive thus further research studying these dimensions is warranted.

The primary implications of the current study are the findings pertaining to maternal attributions of stability and globality in relation to maternal role adjustment in mothers of children with ADHD. These two factors were the most consistent in distinguishing mothers of children with and without ADHD and in understanding role adjustment. These findings suggest that interventions that provide mothers with relief from dealing with the realities of their children's chronic and pervasive behavioral disorder is warranted. Additionally, interventions that help mothers identify and appreciate the breaks in their children's disruptive and negative behaviors may be essential with these parents. While the realities of the child's disruptive behaviors should not be ignored, it is likely that mothers cannot fully enjoy their child's positive behaviors in the midst of negative behaviors. Additionally, overactive or disruptive behaviors that normally are not distressing to parents may be distressing to parents of children with ADHD as their tolerance threshold for their child's behavior may be constantly taxed. Thus, interventions aimed at increasing positive interactions and at helping mothers identify and enjoy such positive interactions may be important aspects of interventions.

Notably, many behavioral treatments for ADHD already include interventions aimed at helping parents identify and reinforce children's positive behaviors (e.g., Barkley, 1998).

Child Attributions

Interesting, when examining child data, attributions about locus and controllability differed for children with and without ADHD whereas attributions about stability and globality did not. Consistent with their disorder and with the literature, children with ADHD rated their behaviors as more internal and less controllable compared to children with ADHD. The difference between the patterns of results found with mother versus child data suggests that children may focus on different aspects of their disorder compared to their mothers. Children may be more attuned to locus compared to their mothers. Certainly, research on internalizing disorders such as anxiety and depression has found that children are a better source for reporting internalizing symptoms compared to their parents (Bell-Dolan et al., 1990). Their attunement to the internal and uncontrollable aspects of their disorder suggests that children with ADHD think about their disorder in a way that is consistent with the diagnosis but also that is inconsistent with Milich's (1994) "self-protective" theory.

The result that children attributed IO behaviors to more internal causes differed from Milich's (1994) findings that children made more external attributions for "task failures." Of course, a primary purpose of the study (and different from Milich's work) was to examine children attributions about their disruptive behaviors (rather than about academic type performance). Although the current study did not test the "buffering" hypothesis, the pattern of attributions found in the current study was inconsistent with

Milich's finding that children with ADHD make external attributions for failures. In the current study, children perceived their disruptive behaviors as internally caused. Further research is needed in order to examine whether or not those accurate (i.e., consistent with current diagnostic understanding of ADHD) are related to poor adjustment (i.e., depression, anxiety, low self-evaluation/self-esteem).

An additional contribution of the current study was the adaptation of Johnston's Written Analog Questionnaire for use with children. The adaptation of this measure and examination of the pattern of attributions made by children about their own disruptive behaviors is an initial step into understanding cognitive factors that may be related to child adjustment. Notably, a next step for the research is to examine children's attributions about their own disruptive behaviors in relation to measures of adjustment such as co-morbid anxiety and depression and measures of self-esteem.

Future directions include examination of attributions in additional social contexts. Children with ADHD have difficulties in peer relationships (Barkley, 1998). The examination of attributions and the effects of these attributions within interpersonal contexts will be an important foray into understanding factors related to social adjustment. Further studies will further the measurement of children's attributions and build on current study findings.

Limitations of Current Studies and Cautions when Interpreting Findings

Although the study was able to provide some new information about the role of attributions in relation to child disruptive behaviors and maternal adjustment, findings should be interpreted with caution due to a number of limitations. The findings that

replicate prior research can be considered more robust. A limitation of the current study is a low sample size, particularly in relation to group comparisons and most particularly for the ADD-Inattentive subtype (where sample size = 12), so that null findings could represent type II errors.

A limitation of the current study is that mothers' ratings of child behaviors and mothers' own self-reported attributions and stress were used for analyses, creating a source-variance confound for those effects. Notably, this limitation is mitigated somewhat by the finding that maternal adjustment was related to teacher ratings of child behaviors as well as maternal ratings of child behaviors.

Third, findings, particularly null findings, must be interpreted with caution given the limited reliability of some attribution scales. Reliability was especially low for the measures of locus attributions perhaps leading to the null findings observed. The Written Analogue Questionnaire yielded a cleaner factor solution and had better reliability than the Recalled Incident Interview and thus was chosen as the primary measure in the study. Despite this, the reliabilities of the locus measures were still poor ($\alpha=.66$ for mother WAQ ratings of IO and Oppositional behaviors; $\alpha=.33$ and $.42$ for RII ratings of IO and Oppositional behaviors). Thus, the lack of findings in the current study for mother attributions of locus may be due at least in part to low reliability of the attribution in the current study. Further work on these measures is in order. Additionally, although controlling for medication status, the issues pertaining to attributions and ADHD as they may be affected by prior knowledge about ADHD, prior knowledge about child's ADHD status, and the effects of attributions about medication warrant further consideration in

order to understand how those factors might affect results, particularly those pertaining to locus but also in relation to other attribution domains.

Another possible measurement issue is that maternal attribution ratings of prosocial/positive behaviors were in the same direction as maternal ratings of child misbehaviors. This pattern of attributions was contrary to expectations. These findings are especially perplexing when considering relations to maternal adjustment. For example, maternal stability and globality attributions for child positive/prosocial behaviors were related to maternal dissatisfaction and stress. That the relations for attributions about positive behaviors were similar to those for misbehaviors suggests mothers may not have distinguished attributions by behavior type.

Conclusion

Despite these issues, the current study adds to the existing literature on attributions in a number of ways. First, the current study findings replicated results pertaining to the different pattern of attributions made by mothers of children with ADHD compared to attributions made by mothers of children without ADHD. Additionally, maternal attributions of stability and globality about child disruptive behaviors (both IO and OPP) were found to be related to maternal adjustment in the current study in directions predicted by both the attribution and ADHD literature and by the general child literature. Significant relations between attributions of locus and controllability were not replicated in the current study; although it is noted that the lack of findings in the current study may be due to measurement limitations.

An interesting additional finding was that child diagnosis appeared to moderate the relation between maternal attributions of stability and globality in relation to maternal adjustment. Adding to the potential significance of this finding is that the relations differed by child diagnostic group for the two adjustment outcome measures. Attributions of stability and globality were related to increased global stress but not role dissatisfaction in mothers of children with ADHD.

While these findings require replication, they suggest that attributions about child behaviors are related to maternal role adjustment and that the ways in which they are related differ in important ways for mothers of children with ADHD compared to mothers of children without ADHD. The results also suggest that maternal attributions about ADHD are commensurate with the realities of having a child with or without ADHD. Adjustment is related to attributions but moderated in part by child diagnosis. Notably, attributions of stability and globality proved most predictive of maternal adjustment. These findings echo the literature; commensurate with the realities of parenting a child with ADHD, respite and self-care for parents of children with ADHD may be an important factor to help parents cope with the challenges of parenting a child with ADHD.

Continued work in this area may be useful in devising interventions for parents. As mentioned above, respite and self-care activities for parents may be an important adjunct to current treatments for child disruptive behaviors. Also, when behavior programs are effective in reducing child disruptive behavior, helping mothers identify and focus on those reductions may be an important cognitive/attribution addition to primarily behavioral programs. In addition to facilitating interventions, the current study

elucidates further a possible mechanisms related to child outcome. An additional study will examine maternal attributions and stress in relation to mothers' parenting behaviors. Additionally, future studies could examine child, peer, and teacher attributions in terms of expectations of children, supports provided, and consequential adjustment.

Notably, while both children and mothers attributions differed by diagnostic grouping of child, the attribution domains that differed were not the same for mothers and children. Children rated their own IO behaviors as internal and uncontrollable. Additional tests for future studies would directly compare mother and child attributions to examine if attributions by behavior type were significantly different within parent-child dyad. This would allow us to understand how attributions may or may not be passed down from mother to child. However, the current study findings suggest that children and mother think about child behaviors in different ways (or at least that they focus on different aspects of the behaviors). No conclusions can be made about a possible "protective" or "deleterious" relation between children's attributions as child attributions were not tested in relation to adjustment. A future study will be to examine children's attributions about their disruptive behaviors in relation to co-morbid internalizing symptoms (i.e., anxiety and depression); that study will provide more data relevant to the implications of the different attributions made by children with and without ADHD.

APPENDICES

Appendix A

Table 65 Studies pertaining to attributions made by children

Study	Sample	Attributions for negative events	Found to be related to	Attributions for positive events	Found to be related to	Event studied
Peterson (Peterson et al., 1998)	Normal adults	Pessimistic explanatory style = stable, internal, global, uncontrollability attributions for negative events	Quitting behaviors Depression Poor physical health	Optimistic explanatory style = Stable, internal, specific attributions for positive events	Optimism Good physical health	Uncontrollable events; Measured attributions about positive and negative events separately
Peterson & Barrett (1987)	College students	Students who made external, unstable, and specific attributions for bad events received higher grades May be part of optimistic style				Attributions about bad/negative academic events
Sweeney, Anderson, & Bailey (1986)	Meta-analytic review, studies with normal adults	Attributions to internal, stable, and global were related to depression		Attributions to external, unstable, and specific for positive events were related to depression Ability and luck attributions for positive were related to depression		
Dweck (Dweck & Leggett, 1988)	Non-disordered children	Low internal responsibility; High external responsibility attributions for combined negative and positive events Termed "helpless"	Lack of effort; increased quitting	High internal responsibility & Low external responsibility for combined negative and positive events Termed "mastery-oriented"	More effort	Internal responsibility for academic success and failures combined Note: did not differentiate positive and negative events
Mischel, Zeiss, &		Internal expectancies	Ineffective activity			Academic type activities

Zeiss (1974)		for negative events				
Licht et al. (1985)	Children with learning disabilities	Attributions to insufficient ability (internal)	Poor performance on persistence reading task			Persistence on reading task
Carlson et al. (2000)	Children with and without ADHD	High internal attributions	Poor performance	"Negative" non-protective attributions were made by ADHD children for positive events as exhibited by low internal & high external attributions, and relation to poor performance		Academic task
Milich (Milich & Okazaki, 1991)	Boys with ADHD	External attributions for failure	Increased effort			Puzzle solving tasks
Hoza, Pelham, Waschbusch, Kipp, & Owens, (2001)	83 boys with ADHD 66 non-disordered boys	Boys with ADHD made less internal (more external) for failures		Boys with ADHD made more external attributions for successes		Puzzle solving task
Hoza, Pelham, Milich, Pillow, & McBride (1993)	27 boys with ADHD 25 non-disordered boys	Less likely to attribute negative social outcomes to internal factors		Boys with ADHD attributed positive social outcomes for internal		Study of self-perceptions and attributions in relation to social outcomes. Low sample size
Johnston & Leung (2001)	Non-disordered children viewing tape of ADHD behaviors	Noncompliance more intentional than ADHD behaviors		ADHD more controllable when behavioral & meds;		Attributions about compliance when treatment involved medication, medication and behavioral, no treatment
Johnston, Fine, Weiss, Weiss, Weiss, & Freeman (2000)	Children with ADHD			Compliance attributed to ability, effort, and task when off-medication;		Attributions about behavior when medicated and not medicated for ADHD

Appendix B

Table 66 Studies pertaining to attributions made by parents

Study	Sample	Attributional style related to negative events	Relation to emotional or behavioral response	Attributional style related to positive events	Relation to emotional or behavioral response	Attributions pertained to
Weiner (1980)	College students	Internal and controllable attributions	Low help-giving Attributions that need was external and uncontrollable were associated with positive emotional response			
Dagnan, Trower, & Smith (1998)	Care staff workers of severity disabled adults	When patient negative behaviors rated as controllable	Were associated with negative emotion and less willingness to help			Negative patient behaviors
Dix & Grusec (1985)	Parents of non-disordered children	Child misbehaviors rated as Internal, controllable, and stable	Such attributions for negative child behavior were rated as likely to be upsetting			Child misbehaviors
Geller & Johnston (1997)	Mothers of nonselected community children	Child noncompliance When rated as more internal and controllable were related to less investment in parenting	When child noncompliance was rated as more internal and controllable were related to less investment in parenting			Child noncompliance; In survey study, examined attributions in relation to self-reported expected emotional and behavioral response
Gretarsson & Gelfand (1988)	Mothers of non-disordered children	Child misbehaviors were rated as external, uncontrollable, and transient		Positive child behaviors were rated as internal, controllable, and stable		Child behaviors
Baden & Howe (1992)	Mothers of boys with conduct disorders	Misbehaviors seen as due to stable and global causes Rated as not controllable				Child misbehaviors

		by parent				
Johnston and Freeman (1997)	Parents of children with ADHD	Hyperactive and oppositional behaviors seen as less controllable and more stable				Child misbehaviors; ratings by parents of children with ADHD were compared to ratings by parents of controls
Johnston et al. (2000)	Mothers of children with ADHD	Negative behaviors were rated as more externally caused when child medicated				Compared ratings of mothers when child on and off medication
Hoza et al. (2000)	Parents of children with ADHD	Child misbehavior rated as due to low child effort	Were related to Low parenting efficacy and dysfunctional discipline			Child negative behaviors

Appendix C

Table 67 Test of differences in attributions made by mothers of children with ADHD diagnosis versus mothers of children without a behavioral disorder, using the RII measure that describes child behavior problems.

	Control	ADHD any type	F statistic (df)	P value	Value on attrib measure	Attributions about ADHD group in comparison to control
RII IO stability	4.7 (2.4)	6.0 (2.2)	4.9 (1,65)	P<.05	1=unstable 10=stable	ADHD more stable
RII IO globality	5.2 (2.5)	7.9 (2.0)	22.8 (1,65)	P<.001	1=specific 10=global	ADHD more global
RII IO locus	6.9 (2.8)	7.5 (2.4)	1.1 (1,65)	n.s.	1=external 10=internal	
RII IO control	7.9 (2.5)	6.0 (2.2)	10.8 (1,65)	P<.01	1=uncontrollable 10=controllable	ADHD less controllable
RII OPP stability	3.8 (2.6)	5.2 (2.2)	5.6 (1,76)	P<.05	1=unstable 10=stable	ADHD more stable
RII OPP locus	5.5 (2.8)	6.5 (2.5)	2.3 (1,67)	n.s.	1=external 10=internal	ADHD more internal
RII OPP control	8.9 (1.2)	7.5 (1.7)	15.2 (1,67)	P<.001	1=uncontrollable 10=controllable	ADHD less controllable
RII Positive control	9.7 (.75)	9.4 (.89)	2.3 (1,67)	n.s.	1=uncontrollable 10=controllable	

*IO=Inattentive-Overactive type of behavior

*OPP=oppositional/disobedient type of behavior

Appendix D

Table 68 Results of maternal attributions about child behavior, testing for group differences when comparing the independent variable of child diagnosis with four levels (ADHD-C, ADD, subthreshold, and controls), dependent variable=attribution domain by behavior type. Using Recalled Incident Interview to measure attributions

		a	b	C				
	Control	ADHD-Combine d	ADD - Inattentiv e	Sub- threshold ADHD	F stat (df)	p-value	Value on attrib measure	Conclu sions
RII IO Stability	4.7 (2.4)	6.0 (2.2)	5.0 (2.8)	5.4 (2.3)	1.7 (3,111)	n.s.	1=unstab le 10=stable	
RII IO globality	5.21 ^{ac} (2.5)	7.91 ^a (2.0)	7.1 (2.0)	7.6 ^c (1.6)	11.1 (3,111)	P<.001	1=specifi c 10=global	Control and ADHD differ Control and subthresh old differ
RII IO locus	6.9 (2.8)	7.5 (2.4)	7.9 (2.9)	7.5 (2.5)	.68 (3,110)	n.s.	1=externa l 10=intern al	
RII IO control	7.9 ^a (2.5)	6.0 ^a (2.2)	7.3 (2.7)	6.7 (2.7)	3.4 (3,111)	P<.05	1=uncontr ollable 10=contro llable	Control and ADHD-C
RII OPP stability	3.8 (2.6)	5.2 (2.2)	5.2 (2.9)	5.0 (2.2)	2.5 (3,113)	P<.1	1=unstab le 10=stable	
RII OPP locus	5.5 (2.8)	6.5 (2.7)	6.3 (2.9)	6.8 (2.5)	1.5 (3,113)	n.s.	1=externa l 10=intern al	
RII OPP control	8.9 ^a (1.2)	7.5 ^a (1.7)	8.8 (1.9)	8.6 (1.3)	5.7 (3,113)	P<.001	1=uncontr ollable 10=contro llable	Control and ADHD-C
RII Positive control	9.7 (.75)	9.4 (.79)	9.8 (.58)	9.6 (.84)	1.2 (3,113)	n.s.	1=uncontr ollable 10=contro llable	

*IO=Inattentive-Overactive type of behavior

*OPP=oppositional/disobedient type of behavior

a indicates significant difference between control and adhd combined groups

b indicates significant difference between control and add inattentive groups

c indicates significant difference between control and "subthreshold" groups

d indicates significant difference between adhd and add group

e indicates significant differences between add and subthreshold groups

f indicate significant difference between adhd and "subthreshold groups

Appendix E

Table 69 Correlations between maternal attributions (using scenario measure, RII) and parent role stress and satisfaction

	Mothers Perception of Parenting Performance	Mothers PSI Total Stress
RII IO stability	-.12	.21*
RII IO globality	-.19*	.37***
RII IO locus	.07	-.06
RII IO control	-.04	-.09
RII OPP stability	-.16+	.26**
RII OPP locus	-.17	.21*
RII OPP control	-.03	-.19*
RII Positive control	.04	-.10

***p<.001, **p<.01, *p<.05

Appendix F

Table 70 Results with RII. Correlations between maternal attributions about child behavior in relation to mother and teacher ratings of child behaviors (3-factor analysis)

	Mom rating of child Inattention	Mom rating of child hyperactivity	Mom rating of child OPP/disobedient Behavior	Teacher rating of child Inattention	Teacher rating of child Hyperactivity	Teacher rating of child OPP/disobedient Behavior
RII IO stability	.19*	.22*	.16+	-.00	.07	.03
RII IO globality	.47***	.42***	.46***	.23*	.25**	.18+
RII IO locus	.14	.03	-.00	0	-.09	-.17+
RII IO control	-.20*	-.14	.00	-.14	-.22*	-.04
RII ODD stability	.22*	.26**	.20*	.06	.12	.09
RII ODD locus	.26**	.17+	.20*	.16	.15	.12
RII ODD control	-.21*	-.22**	-.06	-.06	-.22*	-.02
RII Positive control	-.06	-.05	.01	-.14	-.17+	.01

***p<.001, **p<.01, *p<.05, +p<.1

Appendix G

Table 71 Regression to test mediation of child behavior and maternal role adjustment by maternal attributions with dependent variable=PSI-SF Total Stress, controlling only for child behavior corresponding to attribution)

	Predictor variable	Beta step 1	Beta step 2	Beta step 3	R ² Change Step 1	R ² Change Step 2	R ² Change Step 3
Model 1	Child Inattn	.19*	.14	.16	.44***		
	Child Hyp	.52***	.49***	.55***			
	Globality about IO behavior		.15+	.18+		.02+	
	Interaction term			-.10			.00
Model 2	Child Inattn	.19+	.16	.16	.44***		
	Child Hyp	.52***	.50***	.51***			
	Stability about IO behavior		.10	.10		.01	
	Interaction term			-.00			.00
	Child Disobedien t/ Opposition al	.67***	.58***	.57***	.45***		
	Stability about ODD behavior		.18*	.16		.03*	
	Interaction term			.00			.00

***p<.001, **p<.01, *p<.05, +p<.1

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