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THE ROLE OF MATERNAL ATTRIBUTIONS
IN TREATMENT OUTCOMES FOR CHILDREN WITH ADHD

by

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A Thesis submitted to the Faculty of the Graduate School,
Marquette University,
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the Degree of Master of Science

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ABSTRACT
THE ROLE OF MATERNAL ATTRIBUTIONS
IN TREATMENT OUTCOMES FOR CHILDREN WITH ADHD

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Marquette University, 2013

The goal of the present study was to examine the role that maternal attributions play in predicting treatment outcomes for families of children with ADHD. Specifically, we examined if maternal attributions at the beginning of a psychosocial intervention predicted successful completion of treatment, as well as statistically significant and reliable change in maternal functioning following treatment. Participants included 41 families seeking services for their child from a university-based ADHD clinic; 31 of whom completed treatment. A series of written vignettes were used to assess four domains of causal attributions (i.e., locus of control, global/stable, intentional, controllable). In general, analyses indicated that maternal attributions for negative child behaviors did not significantly predict treatment completion, nor did they predict statistically significant improvements in maternal functioning or reliable change in maternal parenting stress following treatment. There are several potential explanations for these null findings, including the type of cognitions examined, the lack of variability in maternal attributions, characteristics of the sample, and sample size. Although the current findings do not provide support for the influence of maternal attributions, future work with a larger sample would allow for the relation between attributions and treatment outcomes to be further assessed to determine if targeting parental cognitions in standard behavioral parent training is needed.

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The Role of Maternal Attributions in Treatment Outcomes for Children with ADHD

Attention-Deficit/Hyperactivity Disorder (ADHD) is a common behavioral disorder found in 3-5% of school-aged children that is characterized by symptoms of inattention (e.g., inability to stay focused, lack of concentration) and hyperactivity/impulsivity (e.g., inability to sit still, fidgeting), which are atypical in comparison to other children at the same stage of development (APA, 2000). ADHD is a chronic disorder impairing family, academic, and social functioning (Smith, Barkley, & Shapiro, 2006). ADHD has been shown to persist through adolescence and adulthood continuing to impair peer and social functioning and leading to serious and long-term consequences (Daly, Creed, Xanthopoulos, & Brown, 2007).

Due to the fact that ADHD is a pervasive and debilitating disorder, effective evidence-based psychosocial interventions have been established (Pelham, Wheeler, & Chronis, 1998; Pelham & Fabiano, 2008), such as behavioral parent training (BPT; Pelham & Fabiano, 2008; Mah & Johnston, 2008). Despite the empirical support for BPT in the treatment of ADHD, this treatment is not effective with all families (Chronis, Chacko, Fabiano, Wymbs & Pelham 2004; Pelham & Fabiano, 2008), and the intense nature of BPT leads to drop-out rates as high as 50% (Kazdin, 1996; Friars & Mellor, 2007; Johnson, Mellor, & Brann, 2008). Given the remarkable change found in functioning for many of the families that successfully complete treatment (e.g., increased sense of parental competency, decreased parental stress, and reductions in maternal depression; Anastopoulos, Shelton, DuPaul, & Guevremont, 1993; Chronis et al., 2004; Gerdes, Haack & Schneider, 2010), it is important to examine what factors lead families to drop-out of treatment and forego the benefits of BPT (Friars & Mellor, 2007).

One factor that has been examined in the success of psychosocial treatments is the role of parental cognitions (Johnston & Freeman, 1997), and in particular, the influence of parental attributions for child behavior (Hoza et al., 2000; Collett & Gimpel, 2004; Gerdes & Hoza, 2006). Research has shown that the attributions parents make for their child's behavior can influence the way parents behave toward their child and impact how they function as a parent (Miller, 1995; Hoza et al., 2000). Because parents are the implementers of psychosocial treatments it is important to examine the way parental thoughts and beliefs about their child's behavior may influence the success of these interventions. Thus, the purpose of the current study was to investigate the role of maternal attributions in treatment outcomes for children with ADHD. Specifically, we examined if maternal attributions at the start of treatment predicted treatment completion, as well as changes in maternal functioning (i.e., maternal parenting stress and maternal parental efficacy) following treatment.

Parental Cognitions

An important factor that has been suggested to influence the effectiveness of BPT is parental cognitions, which may include perceptions of one's ability to change child behavior, self-esteem, parental efficacy, and attributions for child behavior (Johnston, Mah, & Regambal, 2010). Recent work has shown that parental cognitions may influence initial parental engagement in BPT programs. For example, Johnston, Seipp, Hommersen, Hoza, and Fine (2005) found that parents who believe their child's behavior to be caused by internal, stable, global, and moderately controllable factors are more likely to engage in empirically-supported treatments (e.g., stimulant medication and psychosocial interventions). Similarly, Mah and Johnston's (2008) review suggests that

parental beliefs about one's ability to change child externalizing behaviors predicted perceived appropriateness and acceptability of treatment.

When examining parental attributions, recent work has shown that parents who perceive their child's disruptive behaviors (i.e., noncompliance and hyperactivity) as intentional report more parental stress, feelings of incompetence, and lack of motivation to engage in treatment (Morrissey-Kane & Prinz, 1999; Chronis et al., 2004). Finally, Hoza and colleagues (2000) investigated the impact of several parental cognitions on treatment outcomes of families of children with ADHD. Findings indicate that treatment outcomes were predicted by maternal self-esteem, as well as paternal attributions for negative behaviors and parental efficacy. Specifically, mothers with higher self-esteem, and fathers with higher parental efficacy who placed less responsibility on their child's insufficient effort and poor attitude for their noncompliant behavior were linked to better treatment outcomes.

Why Attributions Versus Other Cognitions

The current study further examined the role of maternal attributions in treatment outcomes for children with ADHD. The reason for this is theoretical research has shown that how parents think, evaluate, and explain their child's behavior influences the way parents respond to their child and, in-turn, influences future behaviors of the child (Bugenta & Johnston, 2000; Johnston & Ohan, 2005; Miller, 2005). For example, Dix and colleagues' (1986) model suggests that parents assess the intentionality of their child's behavior by first considering the motivation of the behavior (e.g., their child throws a rock through the living room window and the parent evaluates whether the rock was thrown to break the window or thrown without considering the consequences).

Parents then assess the controllability of their child's behavior by examining the knowledge the child has about the effects of the behavior (e.g., understands the rock will damage the window), the ability of the child to deliberately produce the effects of the behavior if desired (e.g., child has the ability to throw the rock hard enough to break the window), and lastly determine if the behavior was the result of internal factors (e.g., the child is impulsive) or external factors (e.g., something in their environment triggered the child to throw the rock). In theory, the causal attributions made are directly linked to parent behavioral responses and choice of parenting strategies. Dix and colleagues (1986) suggest that if parents believe that their child's behavior is intentional and internal, they will be angrier and will respond with more power assertive parenting strategies.

Empirical research supports Dix's (1986) theory. Slep and O'Leary (1998) found that mothers who attributed their child's negative behaviors to internal, controllable, and intentional factors were more likely to overreact to these behaviors and use harsher discipline than mothers with less blaming attributions. Others also have shown that parents of children with ADHD who perceive inattentive-impulsive behaviors as more stable, global, and internal to the child report more negative reactions and negative parenting behavior (Chen, Seipp, & Johnston, 2008; Johnston & Patenaude, 1994). Given the knowledge we have about parental attributions of parents of children with ADHD, it is important to better understand how these attributions impact the treatment of this disorder.

Parental Attributions of Children with ADHD

Attributions also were the focus of the current study because a wide body of literature has shown that parents of children with ADHD have different attribution

patterns than parents of control children and has demonstrated the role of parental attributions in pharmacological treatments for ADHD. For example, Johnston and Freeman (1997) found that parents of children with ADHD attribute their child's ADHD behaviors (e.g., inattentive-overactive) to internal and stable, yet uncontrollable factors, whereas comparison parents attribute inattention and over-activity in their child to external and unstable factors. Furthermore, research has found that mothers of children with disruptive disorders, such as ADHD and Oppositional Defiant Disorder (ODD), are more likely to attribute their child's problem behaviors to enduring and pervasive factors and make more negative attributions for their child's failures (e.g., internal and controllable factors), while offering less credit for positive behaviors in comparison to mothers of nonproblem children who attribute positive behaviors to dispositional factors (e.g., internal, controllable, stable; Johnston, Chen, & Ohan, 2006; Johnston & Ohan, 2005; Johnston, Reynolds, Freeman, & Geller, 1998).

Similarly, Collet and Gimpel (2004) found that mothers of children with ADHD attributed undesirable behaviors to more stable and global factors than did mothers of children without ADHD. Gerdes and Hoza (2006) also found a similar attribution pattern when examining parents of children with ADHD. Specifically, mothers of children with ADHD viewed inattentive-impulsive behavior as more internal, global/stable, but less controllable than mothers of comparison children. Noncompliance also was viewed as less controllable by mothers of children with ADHD than mothers of comparison children. On the other hand, mothers of children with ADHD perceived compliance and prosocial behavior as more stable and global, but less controllable and intentional than comparison mothers.

Role of Pharmacological Treatment on Parental Attributions

A small body of literature also has examined the role of pharmacological treatments in parental attributions of parents of children with ADHD. Research has found that parents of children with ADHD attribute greater control to their child's negative behaviors when their child is medicated rather than unmedicated (Ohan & Johnston, 1999; Johnston et. al., 2000). Similarly, Jenson and colleagues (1998) found that parents of children with ADHD attributed their child's negative behavior to lack of effort of the child or ineffective medication while attributing positive behaviors to parental effort and effective medication. In addition, research examining maternal attributions of children with ADHD receiving medication has shown that mothers attribute their child's negative behaviors (e.g., inattentive-impulsive behavior) to uncontrollable factors, which suggests that parents understand that undesired behaviors are out of the child's control and may change their behavioral expectations of the child when medicated (Collet & Gimpel, 2004). Finally, Johnston and colleagues (2000) found that mothers of children with ADHD on stimulant medication perceived negative child behaviors as less internal, stable, and global than positive behaviors, suggesting a more adaptive attribution pattern in mothers when their child is medicated. In addition, mothers attributed their child's positive behaviors (e.g., prosocial and compliance) to internal factors and saw these behaviors as more stable and global (Johnston et. al., 2000).

Several recent studies have examined parental attributions of families receiving both pharmacological and psychosocial treatments. For example, Johnston and Leung (2001) examined the effects of combined treatment (e.g., medication and behavioral), behavioral only, medication only, and no-treatment on parental attribution responses to

child behaviors. Parents of medicated children viewed negative child behaviors as less stable, but more intentional and internal than parents of children receiving behavioral treatment or no-treatment. Lastly, Coles, Pelham, and Gnagy (2010) demonstrated that parents of children with ADHD receiving either behavioral treatment, medication, or both were more likely to attribute their child's success to the efforts of the child and the use of dual treatments (e.g., medication and behavioral parenting strategies) rather than medication alone. Overall, findings examining the effects of pharmacological treatments on parental attributions indicate that, in general, parents make healthier attributions for their child's behaviors when the child is medicated. More work examining psychosocial interventions is needed to determine if a similar pattern emerges.

Why Parental Functioning Following Treatment versus Child Functioning

Although the focus of BPT is on improving child functioning, several studies have demonstrated improvements in parental functioning as well, which may be as important, if not more important, for the long-term success of treatment. Initial research examining changes in parental functioning following a BPT program found that parents reported decreased parenting stress and increased parental efficacy following treatment (Anastopoulos et. al., 1993). These results have since been replicated in more recent studies (Gerdes, Haack, & Schneider, 2012; Hinshaw et. al., 2000; Karpenko et. al., 2009). In addition, one recent study also has shown BPT to yield clinically meaningful changes in parental functioning following treatment (Gerdes et. al., 2012).

Summary

In summary, psychosocial interventions have been shown to be effective evidence-based treatments for many families of children with ADHD, and parental cognitions have been shown to influence the success of these treatments. Specifically, research examining the effect of parental cognitions on treatment outcomes suggests that parental beliefs about one's ability to change child externalizing behaviors, as well as parental attributions for child behaviors predict perceived appropriateness and acceptability of treatment, as well as treatment outcomes. Given that research has documented the importance of attributions in predicting parental affect and behavior, and that differences exist between parents of children with ADHD versus comparison parents with regards to attributions for child behaviors, this seems like an important area to further explore.

Thus, the goal of the current study was to examine the role that maternal attributions play in predicting treatment outcomes for families of children with ADHD. Specifically, we examined if maternal attributions at the beginning of a psychosocial intervention predicted successful completion of treatment, as well as statistically significant improvements and reliable change in maternal functioning following treatment. It was predicted that realistic, but non-blaming attributions (i.e., internal and global/stable but unintentional and uncontrollable attributions) for negative child behaviors (i.e., inattention-impulsivity and noncompliance) would be associated with successfully completing treatment. It also was predicted that this attribution pattern would be associated with greater improvements in maternal functioning (i.e., less maternal parenting stress and greater maternal parental efficacy for statistically

significant analyses) and (i.e., less maternal parenting stress for reliable change analyses) following treatment.

Method

Participants

Participants included 41 families seeking services for their child from a university-based ADHD clinic; 31 of whom completed treatment. Families of children between 5 and 12 years of age were given the opportunity to participate in the study if an ADHD diagnosis was given. As can be seen in Table 1, mothers were of diverse ethnic backgrounds, and the majority were married, had at least a college degree, and were middle class with regards to socioeconomic status (SES).

During the initial intake session, all families seen at the university-based ADHD clinic were asked to consent to their assessment and treatment data being used for research purposes. If functional problems were identified, parents were given the opportunity to participate in a behavioral parent training program. If an ADHD diagnosis was given, parents were invited to participate in the current study examining parental attributions, for which they received partial treatment reimbursement.

Procedure

Assessment and Diagnosis. Children received a comprehensive multimodal, multi-informant ADHD assessment. As part of the assessment, parents responded to an unstructured interview about the presenting problem, as well as social, developmental, medical, and family history. Parents also responded to the Parent Structured Interview for Disruptive Behavior Disorders (DBD; Pelham, Gnagy, Greenslade, & Milich, 1992), a

semi-structured interview focused on symptoms associated with ADHD, ODD, and Conduct Disorder (CD). The primary caregiver also completed measures about their child's behaviors, and both parents completed measures examining parental psychopathology and parental/family functioning. Teachers completed similar child behavior measures, as well as participated in a teacher interview; a classroom observation also was conducted. Finally, children responded to several self-report measures and an unstructured interview.

Diagnostic and subtype decisions were based on clinician judgments from the Parent Structured Interview for DBD (Pelham et al., 1992) and were made by clinical psychology graduate students and a faculty expert on childhood ADHD. The semi-structured interview consisted of 44 items designed to assess ADHD, ODD, and CD symptoms from the *Diagnostic and Statistical Manual of Mental Disorder* (4th ed., Text Revision; *DSM-IV-TR*). Parents rated their child's behavior on a scale of 0 (not a problem) to 3 (severe problem) with regard to specific DBD symptoms. Responses from the semi-structured interview were considered simultaneously with parent/teacher responses from other child behavioral measures (primarily the Parent/Teacher DBD Rating Scale; Pelham et al., 1992), information from the unstructured interview, and behavioral observations when making final diagnostic decisions. Final clinical decisions regarding diagnoses were made by a clinical psychology graduate student with the assistance of a faculty expert on childhood ADHD. Symptoms were considered endorsed when the clinician indicated a moderate or severe rating for a symptom. Endorsed symptoms were then tallied to determine whether diagnostic and subtype criteria were met.

Parental Attributions. In addition to using several measures collected as part of the comprehensive assessment, participating parents completed an additional measure assessing parental attributions for child behaviors. When parents arrived at the clinic for a regularly scheduled appointment, a trained clinical psychology graduate student provided them a brief overview of the study and measures, as well as consented them for the attribution study. Parents were then asked to read written scenarios and watch video clips of confederate children engaging in positive (e.g., prosocial, compliance) and negative (e.g., inattentive-impulsive, noncompliance) behaviors while envisioning their child was the child in each scenario or video clip. Following each written scenario and video clip, parents answered questions about their attributions, parental affect, and behavior. The current study only used the written scenario data and only examined negative behaviors. Parents who participated in the study were given a \$25 treatment fee voucher.

Treatment. The BPT program used in the current study is largely based on Barkley's parenting training modules (Barkley, 1997, 1998). In general, the program consists of 8 to 12, 50-minute sessions focusing on psychoeducation about ADHD and behavioral principles and the development of specialized parenting strategies and skills. Given that each child/family differs, treatment was modified for each family given the presenting problem, functional impairments, comorbidities, and other relevant factors. Sessions were designed to cover topics, such as consistently using time-out, developing a morning/bedtime routine, giving effective instructions, praising positive behavior, creating a token economy (systematic positive reinforcement of targeted behaviors), and establishing and maintaining a classroom intervention.

Measures

For the purposes of the current study, the Parenting Stress Inventory-Short Form (Abidin, 1995) and Parent Sense of Competence Scale (Johnston & Mash, 1989), which were completed as part of the comprehensive ADHD assessment, were used. In addition, the modified Written Vignette Questionnaire (Gerdes & Hoza, 2006; Johnston & Freeman, 1997) was completed by parents who consented to participation in the attribution study.

Parenting Stress Index-Short Form (PSI; Abidin, 1995). The PSI-SF is a parent-report measure, which assesses parenting stress. This measure consists of 36 items, which are divided into three subscales, including Parental Distress, Parent/Child Dysfunctional Interaction, and Difficult Child. In addition, the PSI-SF includes an overall measure of parenting stress. For the purpose of the current investigation, the overall parenting stress scale was used. The 36 items of the PSI-SF are rated on a 5-point Likert Scale ranging from “Strongly Agree” to “Strongly Disagree” (high scores represent greater parenting stress). The PSI-SF total score and subscale scores demonstrate good internal consistency .80-.91 (Abidin, 1995). The PSI-SF also exhibits good construct validity with correlations ranging from .48 to .56 with scales on the SCL-90-R (Haskett, Ahern, Ward, & Allaire, 2006). The measure displayed good reliability in the current study with Cronbach alphas ranging from .90 to .95 (treatment completers versus non-completers) for the overall measure, respectively.

Parenting Sense of Competence Scale (PSOC; Johnston & Mash, 1989). The Parental Efficacy subscale of the PSOC is a parent self-report measure assessing parental efficacy. There are 7 items on this subscale that are rated on 6-point scale Likert scale

ranging from “Strongly Agree” to “Strongly Disagree.” For example, a question on this measure asks, “I honestly believe I have all the skills necessary to be a good parent to my child.” The scores are compiled to produce an overall mean with high scores representing greater parental efficacy. Based on reports from Johnston and Mash (1986), the internal consistency of the parental efficacy subscale has been found to be .76; the PSOC also has been shown to have adequate validity (Ohan, Leung, Johnston, 2000). The measure displayed good reliability in the current study with Cronbach alphas ranging from .84 to .86 (treatment completers versus treatment non-completers).

Written Vignette Questionnaire. The written vignettes have been used in several previous studies examining parental attributions in parents of children with ADHD (Gerdes & Hoza, 2006; Johnston et al., 1997, Johnston et al., 2000; see Appendix A). There are a total of eight vignettes representing four types of behaviors (e.g., prosocial, compliance, inattentive-impulsive, noncompliance); only noncompliance and inattentive-impulsive behaviors were examined in the current study. Following each vignette, parents responded to questions along five dimensions of causal attributions (e.g., locus, stability, intentionality, globality, controllability,), as well parental affect and behavior. Adequate internal consistency has been found among the two vignettes for each behavior with a mean correlation of .54 (Johnston et al., 2000). It also has demonstrated acceptable validity with a mean correlation across all attribution items of .58, suggesting the dimensions to be relatively independent (Gerdes & Hoza, 2006). The measure demonstrated adequate reliability between the two vignettes for each behavior with mean Cronbach alphas of .51 (treatment completers) and .68 (treatment non-completers).

Results

Preliminary Analyses

Prior to testing our predictions, preliminary analyses were conducted. Descriptive statistics for treatment completers are presented in Table 2. Over the course of treatment, mothers reported significant improvements in maternal parenting stress (i.e., dysfunctional interaction, difficult child, and total stress) and parental efficacy. Post-treatment attribution measures were not completed; however, at the start of treatment, mothers tended to perceive their child's inattentive-impulsive behavior as global/stable and controllable, and their child's noncompliant behavior as global/stable, intentional, and controllable.

Correlation Analyses. Initial correlation analyses also were conducted to examine the relation between maternal attribution dimensions (i.e., locus of control, globality/stability, intentionality, controllability) for negative child behaviors (i.e., inattentive-impulsive, noncompliance) and treatment completion. As can be seen in Table 3, only one significant correlation emerged between locus of control for inattentive-impulsive behavior and treatment completion ($r = -.87, p < .05$). Mothers who attributed their child's inattentive-impulsive behavior to an internal locus of control were less likely to complete treatment. Similarly, initial correlation analyses were conducted to examine the relation between maternal attribution dimensions for negative child behaviors and pre-post change scores for maternal parenting stress and parental efficacy. Only one significant correlation emerged between global/stable attributions for inattentive-impulsive behavior and change in maternal parenting stress ($r = -.45, p < .05$). Mothers

who attributed their child's inattentive-impulsive behavior to less global and stable causes reported greater improvement in maternal parenting stress following treatment.

Prior to conducting the last set of correlation analyses, mothers first had to be placed in reliable change categories. In order to examine reliable change in maternal parenting stress, Jacobson and Truax's (1991) method of computing reliable change was employed. As can be seen in Table 5, individual pre-post change scores were compared to RC indices to determine reliable change. An individual pre-post change score greater than 1.65 (1-tailed) was considered reliably changed. This threshold was chosen given the expected direction of maternal parenting stress following treatment. Once individual change scores were compared to RC indices, each mother was placed into one of two groups, which signified whether they made reliable change or did not, which can be seen in Table 6. Mothers classified as reliably improved were of interest and were coded as a 1 to indicate reliable change, and mothers in the remaining group (i.e., no reliable change) were coded as a 0.

Initial correlation analyses were then conducted to examine the relation between reliable change in maternal parenting stress following treatment and maternal attribution dimensions for negative child behaviors. As can be seen in Table 7, significant correlations emerged for global/stable attributions for inattentive-impulsive behavior and reliable change in maternal parenting stress associated with parenting a difficult child ($r = .49, p < .05$) and total parenting stress ($r = .40, p < .05$). Mothers who attributed their child's inattentive-impulsive behavior to global and stable causes reported reliable change in maternal parenting stress associated with parenting a difficult child and overall parenting stress.

Primary Analyses

In order to test our first prediction that realistic, non-blaming attributions (i.e., internal and global/stable but unintentional and uncontrollable) for negative child behaviors (i.e., inattentive-impulsive and noncompliance) would be positively associated with treatment completion, initial correlation analyses between our variables of interest were completed to determine which attribution dimensions to include in our logistic regressions. As previously summarized in Table 3, only one significant correlation emerged. Thus, the logistic regressions that were planned could not be completed.

In order to test our second prediction that realistic non-blaming attributions (i.e., internal and global/stable but unintentional and uncontrollable) for negative child behaviors (i.e., inattentive-impulsive and noncompliance) would be positively associated with improvements in maternal parenting stress and parental efficacy following treatment completion, initial correlation analyses between our variables of interest were completed to determine which attribution dimensions to include in our logistic regression. As previously summarized in Table 4, only one significant correlation emerged. Thus, the logistic regressions that were planned could not be completed.

In order to test our third prediction that realistic non-blaming attributions (i.e., internal and global/stable but unintentional and uncontrollable) for negative child behaviors (i.e., inattentive-impulsive and noncompliance) would be positively associated with reliable change in maternal parenting stress, initial correlation analyses between our variables of interest were completed to determine which attribution dimensions to include in our logistic regressions. As previously summarized in Table 6, only two significant

correlations (along the same attribution dimension) emerged. Thus, the logistic regressions that were planned could not be completed.

Discussion

Although limited, research suggests that maternal cognitions are related to treatment outcomes for families of children with ADHD. Specifically, Hoza and colleagues (2000) found that increased maternal self-esteem, increased paternal parental efficacy, and less blaming paternal attributions for noncompliant behavior were associated with greater reductions in child symptomatology following a behavioral treatment. In order to further investigate the relation between parental attributions and treatment outcomes, the current study aimed to examine the role that maternal attributions play in predicting treatment outcomes for families of children with ADHD. Specifically, the current study examined maternal attributions at the beginning of a psychosocial intervention in predicting successful treatment completion, as well as statistically significant and reliable change in maternal functioning following treatment. Based on Hoza and colleagues' study, it was predicted that realistic, non-blaming attributions (i.e., internal and global/stable but unintentional and uncontrollable) for negative child behaviors (i.e., inattentive-impulsive and noncompliance) would be positively associated with treatment completion, statistically significant improvements in maternal parenting stress and parental efficacy, and reliable change in maternal parenting stress following treatment.

Surprisingly, results of the current study did not support our hypotheses. Analyses indicated that maternal attributions for negative child behaviors did not significantly predict treatment completion, nor did they predict statistically significant

improvements in parental functioning or reliable change in maternal parenting stress following treatment. There are several potential explanations for these null findings, including the type of cognitions examined, the lack of variability in maternal attributions, and characteristics of the sample. Furthermore, the small sample size ($n=31$) also may have contributed to the lack of support for our hypotheses.

One explanation for the discrepant findings between the current study and the Hoza and colleagues' (2000) study may be the type of cognitions that were examined. The current study investigated the influence of maternal attributions for negative child behaviors along the dimensions of locus of control, globality/stability, intentionality, and controllability. In contrast, Hoza and colleagues examined more general parental cognitions, such as parental self-efficacy and self-esteem; the only attribution dimension examined in their study was locus of control. It is possible that the cognitions parents have about themselves are more important in predicting treatment outcomes than the cognitions they have about their child. For example, parents who view themselves as capable and effective parents and human beings may find it easier to implement new parenting strategies and skills acquired in BPT, regardless of the attributions they may make about their child's behavior. This may make them less likely to dropout of treatment and more likely to see improvements in functioning following treatment.

Furthermore, parental attributions for negative child behaviors may be less variable in parents of children with ADHD than more general parental cognitions (i.e., self-esteem, self-efficacy), making it less likely to obtain statistically significant correlations between attributions and treatment outcomes than between general cognitions and treatment outcomes. For example, Johnston and Freeman (1997) identified significant

differences in parental attributions for child behaviors in parents of children with ADHD compared to parents of children without a disruptive behavior disorder; parents of children with ADHD attributed negative child behaviors to more internal, uncontrollable, and stable factors than comparison parents. Similarly, Collet and Gimpel (2004) found that mothers of children with ADHD attributed their child's undesirable behaviors to more pervasive and enduring factors than parents of children without a disruptive behavior disorder. Moreover, Gerdes and Hoza (2006) found that mothers of children with ADHD attributed inattentive-impulsive behavior to less controllable and intentional factors. In sum, previous research suggests that parents of children with ADHD may have a specific attributional pattern, perhaps resulting in little variability, which makes it more difficult to obtain significant relations with other variables.

Finally, an explanation for our lack of significant findings may involve sample differences between the current study and the Hoza and colleagues' (2000) study, including the ethnicity of families and ADHD subtype differences among children. Specifically, participants in the Hoza study were rather homogeneous and consisted of mostly married, middle class, Caucasian families, whereas participants in the current study were more heterogeneous, with almost half of the total sample being from diverse ethnic backgrounds. Unfortunately, clinical child research examining ethnic minority families is quite limited (Miranda et al., 2005). The little work available suggests cultural differences in parental expectations for child behavior exist (Hillemeier, Foster, Heinrichs, & Heier, 2007), which likely influences parental attributions for child behavior. Future work with more ethnically and culturally diverse samples is needed

before understanding if different patterns of attributions may emerge for different ethnic groups.

ADHD subtype differences between samples also may explain differences in findings. All children in the Hoza study received a diagnosis of ADHD-Combined type (ADHD-C), whereas children in the current study were diagnosed with all three subtypes of ADHD. Given that there are differences in presentation between ADHD-C and ADHD-Inattentive (ADHD-I), it is important to consider how subtype differences may influence parental attributions and overall parental functioning. Specifically, research demonstrates that children with Combined Type ADHD are more likely to have an earlier age of onset, comorbid ODD and CD, and functional impairment (i.e., increased social difficulties, academic difficulties, familial conflict) relative to children with Inattentive Only ADHD (Gadow et al., 2004; Milich et al., 2001; Weiss, Worling, & Wasdell, 2003). Therefore, it is not surprising that parents of children with ADHD-C report worse functioning than parents of children with ADHD-I. Specifically, they experience an increased prevalence of psychological disorders, higher rates of parenting stress, and greater life stress relative to parents of children with ADHD-I (Johnson & Reader, 2002; Stawicki, Nigg, & von Eye, 2006). Differences in parental functioning between ADHD subtypes also may result in different attribution patterns for these parents. The current study lumped all of these parents into the same analyses due to concerns about power. In doing so, significant findings may have been more difficult to detect. Future work examining subtypes separately may be needed.

Limitations and Future Directions

Several limitations of the current study should be improved upon in future research. First, the small sample size of the current study may have reduced the level of power, making it more challenging to detect significant findings. It would be beneficial for future research to employ a larger sample size when examining parental attributions and treatment outcomes. Additionally, given the small sample size, the current study was unable to examine potential ethnicity and subtype differences. Future research work with a larger sample should aim to examine the potential role of ethnicity and subtype in the relation between maternal attributions and treatment outcomes.

Additionally, maternal attributions were not assessed following the completion of the psychosocial intervention. It is possible that changes in parental attributions over the course of treatment are more important in predicting treatment outcomes than attributions at the start of treatment. For example, if parents better understand their child's behavior through the course of treatment, these changes in attributional patterns also may be related to changes in parental functioning. Future research should measure parental attributions at the beginning and end of treatment. Finally, the current study did not control for medication status. Research has shown that attribution patterns of mothers of children with ADHD taking stimulant medication differ from attribution patterns of mothers of children not taking stimulant medication (Collet, & Gimpel, 2004; Johnston et al., 2000). Future research examining whether the use of BPT or a combination of BPT and medication influences parental attributions and treatment outcomes is needed.

Clinical Implications

Although the current findings do not provide support for the influence of maternal attributions in predicting treatment completion and outcomes for mothers of children with ADHD, findings should be interpreted with caution given our small sample size. If future work with a larger sample should detect a significant relationship between attributions and treatment outcomes, this would suggest that targeting parental cognitions in standard behavioral parent training is needed. Thus far, limited research has examined if directly targeting parental cognitions within the context of treatment is beneficial; Chronis and colleagues' (2004) work using adjunctive cognitive-behavioral approach to modifying parental cognitions has been successful.

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Appendix A

Thinking about Child Behavior

We would like you to read a series of scenarios describing child behaviors and answer questions about each of them **by circling one number for each question**. Before you begin, however, please read the following information.

Several of the questions reflect judgments people often make when looking for an explanation for why a child behaved as he did. For example, suppose you are walking down the street one day and see a child fall down. In such a situation, you would probably wonder why this child fell down. Did he fall because of feeling faint or dizzy (something about the child), or was it because of something about the situation, perhaps there was a crack in the sidewalk. You might also wonder whether the child could help falling, for example, did he fall because of goofing off trying to walk backwards (a cause that was within the child's control), or was the action caused by something beyond the child's control. You could judge whether the cause for falling was something that occurred in only this one situation, for example the child had just stepped in water that made his shoes slippery, or whether the cause would occur in many situations, for example the child has a physical disability. You could also make a judgment as to whether the reason for the fall was a one time thing or something that will happen again in the future. Finally, you could judge whether the cause of falling was intentional (the child did it on purpose) or unintentional (the child did not mean to do it).

We realize that there can be many things which influence behavior at the same time, and acknowledge that it can be difficult to make these types of judgments. Remember, there are no right or wrong answers, and if you have difficulty judging, just go with your first impression. Several of the questions also ask you to make a judgment on a continuum about how you would feel and respond to certain child behaviors. Please be as honest as possible in your responses. Again, there are no right or wrong answers, and if you have difficulty making a decision, just go with your first impression.

Please remember to read each scenario as if it were a new behavior on a new day and try to vividly imagine you and your child in the scenario.

1) Imagine that your child is in his bedroom getting ready for school. As you walk past your child's room, you look in and see that he has not brushed his hair. You remind your child to brush his hair and wash his face. The child refuses, telling you that his hair doesn't need to be brushed.

1. To what extent do you think your child's behavior was caused by something about him versus something about the situation?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 something about my child something about the situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 not at all within his control completely within his control

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 happens in many situations specific to his situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 a one time thing will happen again in the future

5. To what extent did your child intend to behave the way he did?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 completely intentional not at all intentional

2) Imagine that your child is playing with video games on the computer in the family room. When you call your child for dinner, he does not answer. You go into the room and tell him to come to the table. Your child shakes his head, saying that he won't stop playing and doesn't want to eat dinner.

1. To what extent do you think your child's behavior was caused by something about him versus something about the situation?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 something about my child something about the situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 not at all within his control completely within his control

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 happens in many situations specific to his situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 a one time thing will happen again in the future

6. To what extent did your child intend to behave the way he did?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 completely intentional not at all intentional

3) Imagine that as you walk into the house after shopping for groceries, you see that your child's shoes and school books are lying in the middle of the hallway. You walk to the kitchen where your child is and tell him to pick up his belongings. Your child goes to the hallway and picks up his things.

1. To what extent do you think your child's behavior was caused by something about him versus something about the situation?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 something about my child something about the situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 not at all within his control completely within his control

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 happens in many situations specific to his situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 a one time thing will happen again in the future

7. To what extent did your child intend to behave the way he did?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 completely intentional not at all intentional

4) Imagine that you and your child decide to play a board game after school one day. You get the game down from the shelf and you and your child set up the pieces on the game board and decide which color each of you would like to be. Then your child offers to let you roll the dice first.

1. To what extent do you think your child's behavior was caused by something about him versus something about the situation?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 something about my child something about the situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 not at all within his control completely within his control

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 happens in many situations specific to his situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 a one time thing will happen again in the future

8. To what extent did your child intend to behave the way he did?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 completely intentional not at all intentional

5) Imagine that your child is going through the hall closet looking for his baseball mitt and ball. When your child can't find them, he runs to where you are busy talking on the telephone. He keeps tapping you on the back and interrupting to ask you to help him find the mitt.

1. To what extent do you think your child's behavior was caused by something about him versus something about the situation?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 something about my child something about the situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 not at all within his control completely within his control

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 happens in many situations specific to his situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 a one time thing will happen again in the future

9. To what extent did your child intend to behave the way he did?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 completely intentional not at all intentional

6) Imagine that your child enters the kitchen just as you have finished sweeping the floor and getting the dust in a pile to pick up. Your child doesn't wait for you to finish and heads straight to the fridge. As he rushes through the kitchen, the pile of dirt scatters across the floor.

1. To what extent do you think your child's behavior was caused by something about him versus something about the situation?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 something about my child something about the situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 not at all within his control completely within his control

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 happens in many situations specific to his situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 a one time thing will happen again in the future

10. To what extent did your child intend to behave the way he did?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 completely intentional not at all intentional

7) Imagine that your child and the family are getting ready to sit down for dinner one evening. You are bringing the food out to the dining room table. Your child comes in through the kitchen, and without being asked, picks up the salt and pepper and brings them to the table.

1. To what extent do you think your child's behavior was caused by something about him versus something about the situation?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 something about my child something about the situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 not at all within his control completely within his control

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 happens in many situations specific to his situation

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

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 a one time thing will happen again in the future

11. To what extent did your child intend to behave the way he did?

1-----2-----3-----4-----5-----6-----7-----8-----9-----10
 completely intentional not at all intentional

Table 1

Mother and Child Demographics

	Completed Treatment (<i>n</i> = 31)	Did not complete Treatment (<i>n</i> = 10)	Treatment Completers & Non-completers (<i>n</i> = 41)
Mother Demographics			
Ethnicity, <i>n</i> (%)			
Caucasian	22 (71.0)	2 (20.0)	24 (58.5)
Other	9 (29.0)	8 (80.0)	17 (41.5)
Marital Status, <i>n</i> (%)			
Married	26 (83.9)	3 (30.0)	29 (70.7)
Unmarried	5 (16.1)	7 (70.0)	12 (29.3)
Education, <i>n</i> (%) *			
Graduated high school or GED	3 (9.7)	3 (30.0)	6 (14.6)
Some college/training	4 (12.9)	2 (20.0)	6 (14.6)
College or graduate degree	23 (74.2)	4 (40.0)	27 (65.9)
SES, <i>M</i> (<i>SD</i>) *	53.40 (8.61)	39.94 (13.90)	46.67 (11.26)
Child Demographics			
Age, <i>M</i> (<i>SD</i>)	7.84 (1.72)	7.80 (1.75)	7.82 (1.74)
Gender, <i>n</i> (%)			
Boys	24 (77.4)	7 (70.0)	31 (75.6)
Girls	7 (22.6)	3 (30.0)	10 (24.4)

Note. * denotes missing values.

Table 2

Descriptive Statistics for Treatment Completers

	Pre-treatment	Post-treatment	
	Mean (SD)	Mean (SD)	<i>t</i>
Maternal Parenting Stress			
Parental Distress	24.45 (6.80)	22.32 (6.86)	1.77
Dysfunctional Interaction	24.42 (7.38)	21.74 (6.69)	3.28**
Difficult Child	34.48 (7.44)	29.90 (8.54)	3.71**
Total Stress	83.35 (17.61)	73.97 (19.59)	3.50**
Maternal Parental Efficacy	3.72 (.92)	4.43 (.91)	-5.74**
Inattentive-Impulsive			
Locus of Control	5.37 (1.96)		
Global/Stable	7.16 (1.64)		
Intentionality	5.03 (2.02)		
Controllability	6.90 (1.96)		
Noncompliance			
Locus of Control	5.58 (2.39)		
Global/Stable	6.98 (2.10)		
Intentionality	7.10 (1.58)		
Controllability	8.16 (1.57)		

Note. $n = 31$; ** $p < .01$; Post-treatment attribution measures were not completed.

Table 3

Correlations between Maternal Attribution Dimensions for Negative Child Behaviors and Treatment Completion

	Treatment Completion
Inattentive-Impulsive	
Locus of Control	-.87*
Globality/Stability	.07
Intentionality	-.19
Controllability	-.07
Noncompliance	
Locus of Control	.06
Globality/Stability	.07
Intentionality	.02
Controllability	.14

Note. $n = 41$; * $p < .05$.

Table 4

Correlations between Maternal Attribution Dimensions for Negative Child Behaviors with Pre – Post Change in Maternal Parenting Stress and Maternal Parental Efficacy

Variable	Change in Maternal Parenting Stress	Change in Maternal Parental Efficacy
Inattentive-Impulsive		
Locus of Control	-.16	.15
Globality/Stability	-.45*	.25
Intentionality	.07	-.33
Controllability	.25	-.11
Noncompliance		
Locus of Control	.24	-.15
Globality/Stability	-.25	.13
Intentionality	.19	.00
Controllability	-.09	-.26

Note. $n = 31$; * $p < .05$.

Table 5

S_{diff} for Computing RC Indices for Parenting Stress Measure

	<i>S_{diff}</i> for Computing RC Index
Variable	$x_2 - x_1 / S_{diff}$
Parental Distress	3.94
Dysfunctional Interaction	3.84
Difficult Child	4.44
Total Stress	8.71

Note. *S_{diff}* for computing RC indices were determined based on Jacobsen and Traux's model (1991).

Table 6

Effects of Behavioral Parent Training on Parental Functioning – Reliable Change

Variable	Reliably Improved <i>n (%)</i>	Did Not Reliably Improve <i>n (%)</i>
Maternal Parenting Stress		
Parental distress	7 (22.6)	24 (77.4)
Dysfunctional interaction	7 (22.6)	24 (77.4)
Difficult child	12 (38.7)	19 (61.3)
Total stress	11 (35.5)	20 (64.5)

Note: n = 31 mothers

Table 7

*Correlations for Maternal Attribution Dimensions for Negative Child Behaviors with
Reliable Change in Maternal Parenting Stress*

Variables	RC	RC	RC	RC
	Parental	Dysfunctional	Difficult	Total
	Distress	Interaction	Child	Stress
Noncompliance				
Locus of Control	.03	-.18	-.31	-.35
Global/Stable	.19	.15	.24	.13
Intentionality	.02	-.16	-.09	-.05
Controllability	-.03	.17	.18	.10
Inattentive/Impulsive				
Locus of Control	.14	.24	.16	-.06
Global/Stable	.31	.26	.49**	.40*
Intentionality	-.07	.26	-.11	-.23
Controllability	-.27	-.07	.02	-.16

Note. $n = 31$; * $p < .05$, ** $p < .01$; RC = reliable change.