

Parenting Cognitions and Treatment Beliefs as Predictors of Experience Using Behavioral Parenting
Strategies in Families of Children with Attention-Deficit/Hyperactivity Disorder

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Abstract

We tested a model of mothers' parenting efficacy and attributions for child ADHD behaviors as predictors of experiences with behavioral treatment. The model proposed that mothers' beliefs regarding the acceptability and effectiveness of behavioral strategies would intervene between mothers' cognitions about parenting and child behavior and their treatment experiences. Participants were 101 mothers of 5 to 10 year old children (82% male) with ADHD. Mothers reported their parenting efficacy and attributions for child behavior, and then received a single session of treatment teaching two behavior management strategies. Then, mothers reported their beliefs regarding the acceptability and effectiveness of these strategies. A follow-up phone interview 1 week later assessed mothers' experiences in using the behavioral strategies. The overall model fit the data. Attributions of child ADHD behavior as more pervasive, enduring, and within the child's control were related to seeing behavioral treatment as more acceptable, but neither attributions nor treatment acceptability predicted treatment experience. However, mothers with higher parenting efficacy viewed the behavioral strategies as more likely to be effective, and this pathway significantly predicted positive treatment experience. Implications for understanding the variables that contribute to parental decision-making and treatment participation for childhood ADHD are considered.

Keywords: Attention-Deficit/Hyperactivity Disorder; Behavioral Treatment; Attributions; Treatment Acceptability; Parenting Efficacy

Parenting Cognitions and Treatment Beliefs as Predictors of Experience Using Behavioral Parenting Strategies in Families of Children with Attention-Deficit/Hyperactivity Disorder

Childhood Attention-Deficit/Hyperactivity Disorder (ADHD) has a prevalence of approximately 3 to 7 percent of school-aged children, is associated with significant concurrent impairment, and is predictive of longer term difficulties in a variety of domains (American Psychiatric Association, 2000). As such, successful treatment of ADHD is a high priority. Behavioral treatment is widely recognized as an efficacious, evidence-based treatment for the disorder (Pelham & Fabiano, 2008). In this paper, we consider how parents' pre-treatment cognitions regarding parenting and child behavior, and parents' beliefs about the strategies taught in behavioral parent training (BPT) may predict subsequent engagement and success in using the treatment. This focus on parents' cognitions is justified by the primary role that parents have in decision-making regarding treatment of their children, and by the reliance on parents as the primary agents of child behavior change in home-based behavioral interventions.

BPT is commonly used either as a stand-alone treatment or as one component of broader psychosocial treatments for childhood ADHD (Fabiano et al., 2009). However, based on evidence from families of both children with conduct problems (Nock & Ferriter, 2005) and children with ADHD (van den Hoofdakker et al., 2007), the ability of BPT programs to be maximally effective remains limited by relatively low rates of utilization and adherence. For example, in the MTA study, 37% of parents of children with ADHD refused, had poor attendance, or dropped out of behavioral treatment (Jensen et al., 1999). Although family and child characteristics, such as social disadvantage, predict parents' utilization of and experience with BPT (e.g., Kazdin & Wassell, 1999; Reyno & McGrath, 2006), the relatively immutable nature of many such predictors limits their clinical applications. Drawing from models proposed in social and health psychology (e.g., Ajzen,

2001; Bandura, 1977; Janz & Becker, 1984; Schwarzer & Fuchs, 1996), recent models of parental decision-making regarding child treatment have instead focused on understanding the beliefs and attitudes that may underlie parental reticence to engage in BPT treatments, or that interfere with continued treatment participation (e.g., Bussing, Koro-Ljungberg, Gary, Mason, & Garvan, 2005; Hoza, Johnston, Pillow, & Ascough, 2006; Mah & Johnston, 2008).

In this study, we rely on the model presented by Hoza et al. (2006) and refined by Mah and Johnston (2008) that outlines candidate parenting cognitions as predictors of parents' beliefs regarding BPT, and these beliefs then predict treatment behaviors and outcomes. As such, this model focuses on the early stages of treatment, when parents decide to initiate and engage in BPT. Parenting beliefs about treatment at this stage of decision-making are seen as links between pre-existing cognitions about parenting and child behavior, and the subsequent experiences parents have in BPT. Specifically, this model (refer to Figure 1) outlines the influence of two pre-existing parental cognitions: 1) attributions for child behavior and 2) sense of parenting efficacy. Both of which influence parents' beliefs regarding the acceptability and likely effectiveness of BPT, which in turn predict treatment engagement and outcome. Although previous studies have demonstrated relations among many of these variables, the mediation model as a whole has not been tested, particularly among families offered BPT as treatment for child ADHD. Further, little is known about the specific pathways within the model, such as whether particular parenting cognitions are differentially related to specific types of treatment beliefs. The current study represents a first step in investigating these issues.

We focus on two types of parenting cognitions hypothesized to predict treatment beliefs and, subsequently, responses to BPT - mothers' views of their efficacy as parents and their attributions regarding the causes of child ADHD. Although parenting efficacy and attributions for child behavior

are acknowledged as related in parents of children with ADHD (e.g., Hoza et al., 2000; Johnston & Patenaude, 1994), each also has been linked to parents' experience with treatments for childhood ADHD. With regards to parenting efficacy, Hoza et al. (2000), using data from the MTA study, found that, at least for fathers, parenting efficacy positively predicted treatment response regardless of whether the treatment was child medication or behavioral intervention. To date, this is the only existing study examining parenting efficacy in relation to BPT outcomes in families of children with ADHD. However, in a community sample, Spoth, Redmond, Haggerty, and Ward, (1995) found that mothers' parenting efficacy predicted successful outcomes in a preventive parenting program. In contrast, in the Fast Track prevention trial, parenting efficacy was not predictive of BPT participation (Orrell-Valente, Pinderhughes, Valente, & Laird, 1999), although its relation to treatment outcome was not assessed. Despite the mixed nature of the limited evidence, the demonstrated importance of self-efficacy in predicting a variety of health behaviors (e.g., Bandura, 1997; Schwarzer & Fuchs, 1996) suggests it is reasonable to predict that parents who feel more confident and capable of their ability to execute the parenting role, will view learning parenting strategies as a reasonable and acceptable method of improving child behavior. In addition, parents with higher levels of parenting efficacy are likely to expect success in using BPT strategies, based on their confidence in their ability to meet the challenges of learning, practicing, and using these new skills. Thus, we predict that higher levels of parenting efficacy will be related to beliefs that BPT is an acceptable treatment for children with ADHD, and one that is likely to be effective.

In addition to views regarding their own parenting, parents' pre-treatment attributions of the causes of their child's behaviors also are hypothesized to predict their beliefs regarding the acceptability and likely effectiveness of BPT. Research has shown that parents of children with ADHD often hold a disease model of ADHD, and they are more likely than parents of typically

developing children to attribute child ADHD behaviors to causes over which neither they nor the child have control (Johnston & Freeman, 1997; Sobol, Ashbourne, Earn, & Cunningham, 1989). Although such attributions may limit blame for the ADHD behaviors, they also make it unlikely that parents will assess an intervention that is based on a learning model of child behavior (i.e., BPT) as appropriate. Indeed, Reimers, Wacker, Derby, and Cooper (1995) found that when parents saw externalizing child behaviors as caused by physical factors, they were less accepting of behavioral treatments. Although attributions that see children's conduct disordered behavior as controllable or intentional have been linked to worse treatment engagement (e.g., Hoza et al., 2000; Miller & Prinz, 2003), no studies have yet examined links between attributions specifically for ADHD behaviors and parents' beliefs regarding the acceptability and effectiveness of behavioral treatment. It is possible that, in contrast to conduct problems, attributions of some degree of child control over ADHD symptoms may be desirable as a motivator for behavioral treatment. We predict that the extent to which mothers' attributions for child ADHD behaviors are consistent with a disease model (i.e., due to enduring but uncontrollable causes within the child), mothers will be less likely to see BPT as an acceptable or effective intervention.

Thus far, we have outlined how pre-existing sense of parenting efficacy and causal attributions for ADHD behaviors form the foundation on which beliefs about treatment are based. Views of the acceptability and likely effectiveness of BPT are thus placed in the role of mediators between the pre-treatment cognitions about parenting and children that parents hold, and their treatment decisions and behaviors with respect to BPT. Beliefs regarding the acceptability and likely effectiveness of BPT are seen as the proximal predictors of whether or not parents actually use and benefit from the strategies taught in BPT. Although evidence is consistent in showing that BPT is viewed as an acceptable treatment among parents of children with ADHD (e.g., Johnston,

Hommersen, & Seipp, 2008; Krain, Kendall, & Power, 2005), acceptability has seldom been examined as a predictor of treatment outcome. Contrary to our model, Krain et al. (2005) found that parents' ratings of the acceptability of behavioral treatment did not predict pursuit of this treatment in families of children with ADHD, although a limited sample size and restricted variability in acceptability ratings may have contributed to the null results. In contrast, within samples of parents of children with conduct problems, several studies have demonstrated positive correlations between parents' views of BPT acceptability and treatment success (e.g., Kazdin, 2000; MacKenzie, Fite, & Bates, 2004). Thus, although it is unlikely that beliefs in the acceptability of treatment are the sole predictor of treatment decisions, it seems reasonable that parents must believe that a treatment is acceptable before they will commit to engaging in or using the treatment. We hypothesize that seeing BPT as an acceptable treatment will predict mothers' subsequent positive treatment experiences, and that acceptability beliefs will intervene in the links between parenting efficacy and attributions, and treatment experience.

The second belief regarding treatment that we assessed was expectations for the effectiveness of BPT strategies. Along with decisions regarding the acceptability of BPT strategies, parents also are likely to form opinions regarding the likelihood that the strategies will be effective in improving the child's behavior. In fact, we expect that acceptability beliefs are influenced by evaluations of the likely effectiveness of treatment (Reimers, Wacker, Cooper, & de Raad, 1992). Although we could find no previous studies examining expectations of treatment effectiveness as predictors of treatment experience in families of children with ADHD, several studies conducted in conduct problem samples support this association. Spoth and Redmond (1995) found that, along with other treatment attitudes, if parents perceived a preventive parenting program as likely to offer positive benefits, they were more inclined to enroll in the program. Similarly, Nock, Ferriter, and Holmberg (2007) found

that parents' expectations of treatment effectiveness predicted participation in BPT. Interestingly, Nock and Kazdin (2001) examined this same relation and found a curvilinear association such that treatment attendance was highest among parents with either low or high treatment effectiveness beliefs. Based on these studies with families of conduct problem children, we predict that for mothers of children with ADHD, beliefs regarding the acceptability and effectiveness of BPT will be related, and that effectiveness beliefs will significantly predict positive experiences with BPT treatment. In light of the Nock and Kazdin finding, we also will explore the possibility of a curvilinear relation between these variables. Figure 1 summarizes all of the predicted relations between parenting cognitions, treatment beliefs, and BPT experiences to be examined in this study.

Given that this research is a preliminary step in examining the relations among parenting cognitions, treatment beliefs, and their prediction of the BPT experiences of parents of children with ADHD, we elected to use mothers' reactions to a very brief BPT treatment as a proxy for the experiences one might expect in a longer, more comprehensive treatment program. This methodology allowed us to recruit from a broader range of families because mothers did not need to commit to attending a full BPT program in order to participate. Because the parenting cognitions and treatment beliefs under investigation are expected to predict a range of motivation for participation in BPT, requiring only a single session commitment provided the possibility of including mothers at the lower end of interest in BPT. As the model has been posited as particularly important in the early stages of BPT engagement, a single session treatment seems appropriate for testing these relations.

Methods

Participants

Mothers who reported that their children had ADHD were recruited through community and school notices, from an ADHD clinic at a children's hospital, and from a registry of families

interested in participating in research. Recruitment notices indicated that the research concerned mothers' attitudes and experience with children with ADHD and the treatment of this disorder, and that mothers would receive brief training in behavioral parenting strategies as part of participation. Of 134 families who called about the study and were eligible to participate, 29 declined to participate after learning the details of participation and 4 failed to attend scheduled appointments. One additional mother-child pair was removed due to an error in procedure (measures were administered in the incorrect order), leaving a total final sample of 101 mothers and their 5 to 10 year old children. Of the 101 children, 56 were currently taking medication to treat ADHD (all were stimulant medications) and 45 were not (13 of these had taken medication in the past). Descriptive characteristics of the sample are presented in Table 1.

Children's ADHD status was assessed using a number of criteria. First, mothers indicated that a qualified professional had diagnosed the child. Second, the child met the criteria for ADHD as set forth in the current Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 2000). Mothers and teachers rated the child's behavior over the past 6 months on the ADHD-IV Rating Scale (DuPaul, Powers, Anastopoulos, & Reid, 1998). This measure lists the 18 DSM-IV ADHD symptoms and asks for their frequency on a 4-point scale ranging from 0 (*never or rarely*) to 3 (*very often*). This scale is consistent with the DSM-IV defined structure of ADHD and shows strong reliability and validity (DuPaul et al., 1998). In our sample, Cronbach's alphas on the Inattention subscale were .76 for mothers and .91 for teachers; and on the Hyperactive-Impulsive subscale they were .89 for mothers and .94 for teachers. To be included in the study, a child needed to be rated as 2 or 3 on at least six symptoms on either the Inattention or Hyperactivity/Impulsivity subscales, as rated by either mother or teacher. Mothers were asked the age at which the child's symptoms first became apparent and entry required an onset before age 7.

The criterion for impairment required that both the mother and teacher rated the child as very much or pretty much impaired by the ADHD symptoms on a 0 (*not at all*) to 3 = (*very much*). Finally, children were excluded if the mother reported that the child had mental retardation or a pervasive developmental disorder. Of the 101 children who met criteria, based on mothers' ratings, 24% were Inattentive subtype, 5% were Hyperactive-impulsive subtype, and 71% were Combined subtype.

Mothers and teachers also rated the children's oppositional-defiant behavior on the Oppositional Defiant Disorder Rating Scale (Hommersen, Murray, Ohan, & Johnston, 2006), a scale listing DSM-IV ODD symptoms in a format parallel to that of the ADHD-IV Rating Scale. This measure has good internal consistency and stability over time and relates as expected to other measures of child oppositional behavior (Hommersen et al., 2006). The Cronbach's alpha in this sample was .91 for mothers and .93 for teachers. Using ratings above the mid-point (2 or 3) as indicating symptom presence, 69 of the 101 (68%) children had at least four symptoms as required by the DSM-IV definition of Oppositional Defiant Disorder. We assessed ODD symptoms to see if this comorbidity influenced any of the predicted relations.

Measures

Treatment History. Mothers completed a questionnaire about their prior treatment experiences for ADHD (Johnston, Seipp, Hommersen, Hoza, & Fine, 2005). This questionnaire asks about whether the parent has used medication, behavioral strategies, and other treatments (e.g., diet) for ADHD, if so, how effective each was for their child (rated on a scale from 1 = *very ineffective* to 7 = *very effective*).

Parenting Cognitions. Parenting efficacy was measured on the Parenting Sense of Competence Scale – Efficacy Subscale (PSOC-Efficacy) (Johnston & Mash, 1989). The measure has seven items (e.g., I honestly believe I have all the skills necessary to be a good mother to my child)

rated on a 6 point scale from *Strongly Agree* to *Strongly Disagree*. Scores are averaged across items and higher scores indicate greater feelings of parenting efficacy. The measure has demonstrated internal consistency and correlates as expected with measures of parenting (e.g., McLaughlin & Harrison, 2006) and child problems (e.g., Johnston & Mash, 1989). Scores on the measure predict treatment response among families of children with ADHD (Hoza et al., 2000). In this sample, the internal consistency was .75.

Mothers completed the Written Attribution Questionnaire (WAQ) (Johnston & Freeman, 1997) to assess attributions regarding the cause of ADHD child behaviors. Variations of this measure have been used in previous studies and have demonstrated internal consistency, stability over a 1-year period, differences in attributions offered by mothers of children with ADHD and control groups, and correlations with parents' reactions to child behavior (e.g., Johnston, Chen, & Ohan, 2006; Johnston & Freeman, 1997; Johnston, Hommersen, & Seipp, 2009; Johnston & Leung, 2001). In this study, the WAQ included, in random order across mothers, 14 scenarios describing a child interacting with his or her mother. Six of the scenarios described the child displaying ADHD symptoms (three scenarios described inattentive behaviors, such as becoming distracted while cleaning up toys and three scenarios described impulsive behaviors, such as interrupting when the parent is on the telephone), four described oppositional behaviors, and four described prosocial behaviors. For the purpose of this paper, we include responses to only the six ADHD behavior scenarios. Mothers read each scenario imagining it described their child, and then rated the cause of the child behavior on dimensions of locus (1 = *something about the child*; 10 = *something about other people/the situation*), globality (1 = *specific to this situation*; 10 = *happens in many situations*), stability (1 = *a one time thing*; 10 = *will happen again in the future*), control (1 = *not within the child's control*; 10 = *within the child's control*), and responsibility (1 = *hold the child responsible*; 10

= *don't hold the child responsible*). The locus and responsibility dimensions were reversed and then scores were averaged across the scenarios and dimensions. Internal consistency was .84. Scores ranged from 1 to 10, with higher scores indicating attributions of ADHD behavior to relatively more internal, stable, global, and controllable causes for which the child was responsible.

Treatment beliefs. To assess mothers' views of the acceptability of behavioral strategies, we adapted four items from the short form of Kazdin's Treatment Evaluation Inventory (TEI-SF; Kelley, Heffer, Gresham, & Elliott, 1989). Mothers responded on a 5-point scale from *Strongly Disagree* to *Strongly Agree* to four items that assess the acceptability of the behavior strategies, their willingness to use these strategies, their liking of the strategies, and their overall reaction to the strategies. Ratings were averaged across the four items, with higher scores indicating greater acceptability, and the internal consistency of the scale was .84.

To assess mothers' expectations regarding the effectiveness of the behavioral parenting strategies, we used the Child Improvement subscale of the Parental Expectancies for Treatment (PETS – CI; Nock & Kazdin, 2001). This scale has eight items (e.g., How much do you believe these strategies will help you in being a parent?) rated on a 1 to 5 scale. To make the measure more specific to assessing expectancies for the parenting strategies that mothers learned in this study, the items were modified slightly such that “these strategies” was inserted instead of “this treatment.” Scores were averaged and the internal consistency was .84. Higher scores indicate greater expectations of effectiveness for the behavioral strategies.

Post-Treatment Experience Using Behavioral Strategies. Approximately 1 week following the mother's participation in the session which taught behavioral strategies, she completed a telephone interview with a research assistant (average days between participation and the telephone interview = 10.48, SD = 9.49; median = 8.00; mode = 7.00; range 3 to 93¹). Using a structured

interview protocol, the mother was questioned about her experiences using the strategies with her child over the past week. For each of the strategies taught (i.e., special time and giving instructions/reinforcers), mothers rated how useful they had found the strategy (1 = *not very useful* to 10 = *very useful*), how satisfied they were with the strategy (1 = *quite dissatisfied* to 10 = *very satisfied*), and whether their child liked the strategy (1 = *didn't like it at all* to 10 = *liked it a lot*). For each skill, these three ratings were averaged into a total use/liking score (alphas of .60 and .76 for child-directed play and instructions/reinforcers). Mothers also rated the extent to which their child's behavior had changed since the time of initial participation (rating of 1 = *much worse* to 10 = *much better*).

Procedures and Treatment Description

The research was approved by our institution's ethics board. Families called the laboratory and were provided with information about the study. If the family was interested and met initial eligibility requirements, an appointment for the mother and child to visit the laboratory was arranged. Upon arrival, the study was described in detail and mothers consented and children assented to participation. Mothers began by completing the Treatment History Questionnaire. Then, in random order across mothers, measures of cognitions regarding the child's behavior and parenting (i.e., attributions for ADHD child behavior, parenting sense of efficacy) were completed².

Following completion of these measures, mothers participated in a 1-hour BPT session with a graduate student therapist who taught two behavior management strategies: child-directed play and using effective instructions and reinforcers. The treatment was manualized and based on skills covered in available behavioral parenting treatment programs, such as the Cope Program (Cunningham, 2006) and Parent-Child Interaction Therapy (Eyberg et al., 2001). Four PhD level

graduate students in clinical psychology (one male, three female) served as therapists. Each student therapist had prior therapy experience, including work with parents and children.

Sessions began with a brief description of a reciprocal model of parent-child interactions, including a rationale for why altering parenting behavior was an appropriate treatment for child problems. Then, skills for child-directed play were reviewed with the mother, using a Socratic approach in which the therapist presented the skills using examples from the mother's previous positive experiences playing with her child. For each mother, this discussion ended with the therapist providing a summary of how to effectively use child-directed play. Then, two role-plays were conducted, once with the mother as the child and the therapist demonstrating the skills, and a second time with the therapist as the child and the mother practicing the skills. In the second half of the session, skills for giving effective instructions and using reinforcers were presented in the same fashion. Mothers also were provided with written materials outlining the skills and a log for recording their use of the strategies over the coming week.

Student therapists were trained and supervised by the first author. Within each treatment session, therapists followed a treatment manual. All sessions were audiotaped and checked for fidelity by a research assistant with 30% independently reviewed by the first author. Interrater agreement on the number of elements in the treatment manual that had been covered was 84%. On average, therapists covered 97% of the treatment manual ($SD = 4$; range 89 to 100%).

The therapists left the room after the therapy session, and the research assistant gave the mother the measures of treatment beliefs (i.e., treatment acceptability, expectations of treatment effectiveness) to complete. The order of the measures was randomized across families. The mother was given a \$50 honorarium for participation and her child received a tee shirt. One week later, a

research assistant contacted the mother by phone and administered the interview regarding experiences in using the behavioral strategies.

Results

Data Analytic Approach

The data were analyzed in six steps. First, mothers' previous treatment experiences and the variables in the model were examined descriptively. Second, data inspection and preliminary analyses were conducted to examine any missing data, multivariate outliers, and the distributions of all scores. Third, an exploratory factor analysis was performed to determine the latent construct of mothers' post-treatment experiences measured from the follow-up telephone interview asking about the mothers' experience using the behavioral strategies. A principal components analysis with varimax rotation was used, and factor structure was determined based on eigenvalues over 1.0 and inspection of the scree plot. The resulting factor structure was then subjected to confirmatory factor analysis in the subsequent structural model. Fourth, correlations among mothers' parenting cognitions, treatment beliefs, and treatment experience were conducted, along with examination of possible covariates. Fifth, AMOS (7.0) (Arbuckle, 2006) was used to test the structural model relating parenting cognitions to treatment experience via the intervening treatment beliefs. Full information maximum likelihood (FIML) was used to maintain the representativeness of the sample and to utilize all available data³. Compared to other missing data techniques (i.e., list-wise deletion and pair-wise deletion), FIML has been shown to be better at determining parameter estimates, parameter estimate efficiency, model goodness of fit, and reducing model convergence failures (Enders & Bandalos, 2001). In the model, the factor was scaled by setting one factor loading to a unit weight of 1.0. To further ensure the model was identified, for all other latent variables (i.e., uniqueness and disturbances), the path coefficients were set to 1.0 (Arbuckle, 1995, 2007). The

FIML estimation in AMOS provides a number of indices of model fit. Following the recommendations of Hu and Bentler (1999) for sample sizes below 250, good model fit was defined by 1) a nonsignificant chi-square value, 2) a RMSEA value less than .06, and 3) a comparative fit index (CFI) of .95 or greater. The CFI is more robust in small sample sizes compared to other fit estimates, as it has a small downward bias, small standard error, and is minimally affected by sample size (Hu & Bentler, 1998). All significance tests were two-tailed. Sixth, and finally, the structural model was tested again to consider the influence of child medication status.

Previous Treatment History

Mothers' responses to the Treatment History Questionnaire provided a description of their previous treatment experiences. Mothers whose children were currently taking medication for ADHD ($n = 56$) indicated, on a 1 to 7 scale that the medication was quite effective (mean = 5.66, SD = 1.31). Of the children who were not currently taking medication ($n = 45$), 29% had taken medication in the past. With regard to behavioral strategies, 76% of all mothers indicated they used such strategies frequently (mean = 2.72 on a 1 to 3 scale, SD = .53). They rated the effectiveness of behavioral strategies as moderate at 4.64 (SD = 1.19) on a 1 to 7 scale. Mothers also were asked about other treatments for ADHD and 40% indicated they had used dietary treatment (mean effectiveness = 3.38, SD = 1.73), 30% indicated their child had had individual therapy (mean effectiveness 4.66, SD = 1.61), 30% had used vitamin or naturopathic therapy (mean effectiveness 2.96, SD = 1.82), 19% had been in family therapy (mean effectiveness 4.68, SD = 1.89), and 6% had used neurobiofeedback (mean effectiveness = 3.50, SD = 1.38).

Moving to the variables in the model, these mothers indicated levels of parenting efficacy just above the mid-point of the scale (average of 3.82 on a 1 to 6 scale), and these were comparable to levels reported by mothers of children with ADHD in previous studies (e.g., Gerdes et al., 2007;

Hoza et al., 2000). Similarly, the mothers' attributions for the causes of child ADHD behavior were similar to those reported in previous samples of mothers of children with ADHD (e.g., Chen, Seipp, & Johnston, 2008; Johnston et al., 2005). For each attribution dimension separately, on the 1 to 10 scale, mothers saw the cause of ADHD behaviors as highly stable (mean = 8.00) and global (mean = 7.28), as internal to the child (mean = 6.58), but as just slightly controllable (mean = 5.64) or the child's responsibility (mean = 5.86). These midlevel ratings of child control and responsibility assure us that these mothers were not placing extreme blame on the child for the ADHD behaviors, but rather that they saw the child as having some degree of control and responsibility for the behaviors.

Across the TEI items, on a 1 to 5 scale, mothers rated the BPT strategies as highly acceptable (mean = 4.67), and this was higher than the acceptability ratings (mean = 3.67) provided in response to a written description of BPT by mothers of children with ADHD in Johnston et al. (2008). This difference may reflect evaluation of written versus in vivo exposure to BPT strategies. Finally, on the PET-S, also on a 1 to 5 scale, mothers rated the BPT strategies as quite likely to be effective (mean = 3.98), comparable to the average rating of 3.82 provided by mothers of clinic-referred aggressive children (Nock & Kazdin, 2001). In sum, the mothers in this study appeared similar to other samples of mothers of children with ADHD or disruptive disorders.

Table 2 presents the standardized Treatment Experience scores. Looking at the raw scores on each component that formed this score, mothers rated their use/liking of child-directed play as 8.60 (SD = 1.11) on a 1 to 10 score, and their use/liking of instructions/reinforcers as 7.80 (SD = 1.50). Also on a 10 point score, mothers rated their child's improvement as 6.75 (SD = 1.60) compared to before the study. As such, the mothers were, on average, quite positive about their experience with the BPT strategies.

Multivariate normality and linearity represent two main assumptions of structural equation modeling (Enders, 2001). Multivariate normality was indirectly assessed by examining the bivariate distributions. Test statistics revealed that one distribution, use/liking of child-directed play strategies was both skewed (-1.31) and kurtotic (3.49, $p < .001$). To correct for this, each score was subtracted from the highest score, a constant of 1 was added, and finally a logarithmic transformation was applied (Tabachnick & Fidell, 2007). This approach successfully brought the distribution closer to normality (skewness = -.14; kurtosis = -.43), and the transformed scores were used in all subsequent analyses. The distribution for the WAQ scores was also mildly kurtotic (1.50); however, given the mildness of skew, no corrections were made to the univariate distribution. As an approximation of testing for multivariate normality, potential violations of linearity were not evident after examination of scatter plots of first order correlations. No multivariate outliers were significantly above the critical Mahalanobis distance when the predictors were linearly combined ($p < .001$).

Exploratory Factor Analysis of Mothers' Treatment Experience

Using principal component analysis with a varimax rotation, the following measures were factored: rating of overall child behavior change, use/liking of child-directed play, and use/liking of instructions/reinforcers. The factor analysis produced one factor with an eigenvalue of 1.73 and accounted for 57.51% of the variance. All three measures loaded above .40 on the factor: child behavior change (.81), use/liking of child-directed play (-.75)³, and use/liking of instructions/reinforcers (.71). The factor was labeled Treatment Experience, with higher scores indicating more positive experience.

Correlations between Parenting Cognitions, Treatment Beliefs, and Treatment Experience

We conducted correlations between mothers' parenting cognitions, treatment beliefs, and treatment experience measured at the 1-week follow-up (Table 2). As predicted, the two treatment

belief variables, acceptability and effectiveness, were significantly related. Also as predicted, mothers' beliefs about treatment effectiveness were significantly related to their subsequent positive treatment experience. When we examined the scatterplot for the relation between beliefs of treatment effectiveness and treatment experience, there was no evidence of the curvilinear relation found by Nock and Kazdin (2001). However, contrary to expectations, mothers' beliefs regarding the acceptability of the behavioral strategies were not significantly correlated with their treatment experience. Turning to the parenting cognitions, in this sample, parenting efficacy and attributions for child behavior were not significantly related. Interestingly, mothers' parenting cognitions were differentially related to their treatment beliefs. As predicted, attributions of child ADHD behavior were significantly related to the acceptability of the behavioral strategies, and mothers' parenting efficacy was significantly related to beliefs that the behavioral strategies would be effective. However, the alternate relations, between attributions and effectiveness beliefs, and between parenting efficacy and acceptability were not significant.

Examination of Covariates. We also conducted correlations between the variables of interest in the model and demographic variables, as well as child ADHD and ODD symptoms to determine if any of these variables needed to be controlled in later analyses. Child age, family SES, mothers' marital status, ethnicity, mother reports of child inattentive, hyperactive, and oppositional symptoms, and teacher reports of child hyperactivity/impulsivity were not significantly related to the variables in the model. Child gender (1 = male; 2 = female) and mother's age were significantly correlated with parenting efficacy, $r(97) = -.27, p < .01$, and $r(99) = -.31, p < .01$, respectively. Teacher reports of child inattentive symptoms were significantly related to mothers' attributions, $r(96) = -.21, p < .05$, and their reports of child oppositional symptoms were related to mothers' acceptability of BPT, $r(96) = -.25, p < .05$. Nevertheless, no significant changes in relations between parenting cognitions,

treatment beliefs, and treatment experience were identified when these demographic variables (i.e., child gender, mother's age, teacher reports of child inattentive and oppositional symptoms) were controlled (see Table 2). Thus, no covariates were used in the structural model below.

Structural Model

Consistent with results from the exploratory factor analysis, the three measures of treatment experience assessed during the follow-up telephone interview, all had significant factor loadings (i.e., $p < .001$) on the latent variable of Treatment Experience within the full model: child behavior change (.64), use/liking of child-directed play (-.64)³, and liking of instructions/reinforcers (.53).

Support was found for the hypothesized model linking pre-treatment parenting cognitions to treatment experience via the intervening effects of treatment beliefs: $\chi^2(10) = 13.06, p > .20$, RMSEA = .055, CFI = .96. Overall, the model accounted for 28% of the variance in treatment experience. Figure 2 displays the significant standardized direct effects in the model. Partial support was found for hypotheses regarding direct effects of mothers' parenting cognitions on treatment beliefs. Consistent with hypotheses, mothers' parenting efficacy had a direct effect on expectations of the effectiveness of the behavioral strategies, and mothers' attributions for child ADHD behavior had a direct effect on their beliefs regarding the acceptability of the treatment. Contrary to hypotheses, however, parenting efficacy did not have a significant direct effect on treatment acceptability beliefs ($\beta = -.14, p > .05$), nor attributions for child ADHD behavior on beliefs regarding treatment effectiveness ($\beta = .04, p > .05$). As predicted, mothers' beliefs about the effectiveness of the behavioral strategies had a direct effect on their ratings of treatment acceptability, and a direct effect on treatment experience. However, acceptability did not have a significant direct effect on treatment experience ($\beta = .001, p > .05$).

Indirect effects were calculated to test our prediction that beliefs about treatment effectiveness and treatment acceptability would act as intervening variables between the pre-treatment predictors of parenting efficacy and attributions for child behavior, and the dependent variable of treatment experience. However, we could not use bootstrapping to determine the indirect effects because of the problems created by even the small amount of missing data. As an alternative, Bayesian analyses were used to estimate indirect effects and 95% credible intervals (CI) were calculated. Results were suggestive of a significant indirect effect of parenting efficacy on treatment experience ($\beta = .15$; $CI_{.95} = .03, .28$). Given the nonsignificant relation between parenting efficacy and treatment acceptability, it is likely that this indirect effect was exerted through beliefs about treatment effectiveness. There was a nonsignificant estimated indirect effect of attributions on treatment experience: ($\beta = .01$; $CI_{.95} = -.10, .13$).

Child Medication Status

Given that approximately half of the children were currently medicated for ADHD, and previous research has found relations between medication and maternal social cognitions (e.g., Johnston & Leung, 2001), we re-ran the model to take child medication status into account. Whether or not the child was taking medication to treat ADHD was placed in the beginning of the model with two direct recursive paths each leading to parenting efficacy and attributions. The correlational path between parenting efficacy and attributions was then removed, but all other pathways remained the same. Results indicated a slightly weakened model fit compared to the original model: $\chi^2(16) = 21.06, p > .15, RMSEA = .060, CFI = .934$. Medication status did not have a significant direct effect on parenting efficacy ($\beta = .10, p > .05$), nor on attributions for child behavior ($\beta = -.12, p > .05$). All other path coefficients remained the same as those presented in the original model (see Figure 2). Consistent with the original results, the model continued to account for 28% of the variance in

treatment experience. Thus, child medication status did not appear to be a significant contributing factor to the relations between maternal parenting cognitions, treatment beliefs, and treatment experience.

Discussion

The tested model linking parenting cognitions to treatment experience, via intervening treatment beliefs was partially supported. Among mothers of children with ADHD, attributions for ADHD child behaviors were related to beliefs regarding the acceptability of BPT strategies, but neither of these variables predicted the mothers' experiences in using the strategies. Instead, mothers' parenting efficacy was related to their positive treatment experience via their beliefs regarding the likely effectiveness of the BPT strategies. There are two important take home messages that can be gleaned from the results. First, although mothers' attributions for child behavior and their beliefs regarding the acceptability of BPT are related, neither of these is a significant predictor of mothers' experience with BPT. Second, what does seem important in determining mothers' positive experience with BPT strategies, is mothers' views of their ability to parent, and in turn their views of parenting strategies as likely to be effective in managing the behavior of their child with ADHD.

We had predicted that mothers who made attributions for child ADHD behaviors that, while acknowledging the cause as within the child and pervasive/enduring, also saw the child as having at least a modest degree of control or responsibility, would be mothers who would see the learning-based approach used in BPT as most acceptable. This prediction was supported and confirms that mothers' more general views of child behavior are related to their assessments of specific treatments. However, in this sample, the acceptability of treatment did not predict mothers' actual use or liking of the strategies over the ensuing week. This finding is consistent with the results obtained for

families of children with ADHD by Krain et al. (2005), as well as with studies examining links between treatment acceptability and outcome in other populations and settings, including BPT with mothers of conduct problem children (e.g., Peters, Calam, & Harrington, 2005) or anxious children (e.g., Barrett, Shortt, & Wescombe, 2001) and school interventions (e.g., Noell et al., 2005). Although a restricted range of acceptability ratings among a sample of mothers who had agreed to participate in a study involving BPT may offer some explanation for our lack of prediction, acceptability had at least enough variability to correlate significantly with attributions and with beliefs about treatment effectiveness. However, it must be acknowledged that the lack of association between acceptability beliefs and treatment outcomes is not a unique finding. Further research is needed to determine if and when parents' views of treatment acceptability are important determinants of their subsequent treatment choices for their children. We speculate that there are two limitations to existing research. First, as in this study, ratings of treatment acceptability are often very high and may lack sensitivity. Second, acceptability may have a more step-like function in relation to treatment outcome, such that some threshold of acceptability is needed but beyond that other factors are more important in decision-making.

In contrast to the nonsignificant links of attributions and acceptability to treatment experience, parenting efficacy was associated with positive views of the effectiveness of behavioral strategies, and these effectiveness beliefs intervened to predict treatment experience. Mothers who felt competent in the parenting role were more likely to see behavioral strategies as effective, and to report greater and more successful use of them. These links in this sample of mothers of children with ADHD, replicate similar relations observed in fathers of children with ADHD in the Hoza et al. (2000) study, and findings in conduct problems samples (e.g., Nock et al., 2007; Spoth et al., 1995). Unlike Nock and Kazdin (2001), we found no evidence of a curvilinear relation between

expectations for treatment effectiveness and treatment use. We speculate that the mothers in our sample may have represented the mid to high range of beliefs about treatment effectiveness, given that they all agreed to participate in a study that involved BPT. We also acknowledge that most of the mothers in this study reported already using behavioral strategies with their children, and hence their views of the effectiveness of BPT and their use of these techniques were probably, to some extent, established prior to participation. However, mothers' reports of the frequency of their use of behavioral techniques prior to the study were not correlated with their ratings of the acceptability of the BPT strategies taught in the study ($r = .01$, ns) nor with their experience in using these strategies reported at the 1 week follow-up ($r = -.03$, ns). Mothers' ratings of the effectiveness of the behavioral techniques they were using before participating in the study were correlated significantly, but modestly, with acceptability ratings ($r = .43$, $p < .001$) and treatment experience ($r = .24$, $p = .02$). Thus, although the acceptability and treatment experience measures in this study were related to mothers' pre-existing attitudes and practices, they are easily distinguished as separate constructs.

These results have important implications for the development of methods for predicting how parents of children with ADHD might be encouraged to engage in BPT and hopefully to gain maximum benefit from the treatment. Our findings suggest that a focus on the acceptability of the treatment is unlikely to lead to fruitful prediction of who will and will not engage in or benefit from the treatment. Instead, a focus on parents' pre-existing feelings about themselves as parents and their beliefs about the effectiveness of behavioral treatment may yield greater impact. Pre-intervention efforts may be needed to enhance parents' sense of their own capabilities as parents. For example, based in a motivational interviewing framework, Nock and Kazdin (2005) demonstrated the ability of a brief, pre-intervention to increase parents' participation in a BPT program. We speculate that part of the success of this program may have been achieved through increases in parents' sense of

efficacy and confidence in their ability to carry out the changes required in the BPT program.

Whether enhanced parenting efficacy would lead parents to be more optimistic that BPT will be effective (as specified by the model tested in this paper), or whether separate efforts would also be needed to relay to parents the evidence of the effectiveness of BPT treatments, is not known.

Consistent with recent work by Cunningham and colleagues (2008), we emphasize that further research examining how parents may differ in their preferences for various forms of mental health treatments is much needed. Hopefully such research will serve to guide efforts to improve the utilization of and adherence to evidence-based child mental health services.

The limitations to this study must be considered when drawing conclusions and considering clinical implications. Although our model contains directional arrows, the reciprocal and transactional nature of the relations among these variables is obvious. For example, parenting efficacy is seen as a pre-existing predictor, but is acknowledged as likely to change during the course of BPT (e.g., Sonuga-Barke, Daley, Thompson, Laver-Bradbury, & Weeks, 2001). Similarly, beliefs regarding the effectiveness of BPT, although placed in a predictor role, are clearly also the product of experiences in using BPT strategies. Although the child's medication status did not have a significant effect in our model, our measurement captured only whether or not the child was currently being treated with medication. Other aspects of medication such as whether or how frequently the parent was using medication in the home setting would be more important to assess in future studies. Our design was technically longitudinal in nature, with measures of parenting cognitions taken before the BPT treatment, beliefs about the treatment assessed following the treatment session, and assessment of the mothers' experience using the behavioral strategies conducted 1 week later. However, it would be a stronger test of the model if these measurement points were more separated in time, or if these variables were assessed in families who were more

treatment naïve and earlier in the process of making treatment decisions. We used a single session of BPT, as a practical analogue of a more comprehensive BPT program. However, our data cannot address how the relations among parenting cognitions and treatment beliefs would change or unfold as a family progressed through a longer BPT program. Both of these limitations point to questions regarding whether or not the same results would appear in typical clinical contexts, where assessment and treatment would be more separated in time and where parents' experiences with BPT would be monitored over a longer period of time, and in the context of ongoing therapist feedback. Finally, self-report is highly appropriate for parenting cognitions and treatment beliefs, however, our measure of treatment experience also relied solely on mothers' report. Certainly a mother's views of her experience with the strategies are an important component of treatment outcome, but more objective measures of use of the strategies or of changes in child behavior would have been useful.

In sum, we believe this study offers useful insights into the parenting cognitions and treatment beliefs that are at play as parents make decisions regarding treatments for their children with ADHD. Our results suggest that parenting efficacy and beliefs in the effectiveness of BPT strategies are important predictors of mothers' successful experiences with this form of treatment. In our sample, the child's medication status did not play a significant role in the model, however, future work is needed to more carefully consider how parents choose among a number of alternate treatments for their children with ADHD. Many questions remain before we will understand the cognitive processes that underlie parents decisions to select, sequence, and/combine different evidence-based treatments (e.g., behavioral versus medication). We must also expand our study to focus on parental choices of treatments with little evidentiary support (e.g., Bussing et al., 2005), and to acknowledge that treatment decisions do not rest solely with mothers. The roles of fathers, children, extended family, and the broader social and cultural context also must be considered.

Footnotes

¹One mother did not complete her follow-up until 93 days following the BPT session due to an unplanned hospitalization. She began to practice using the strategies when released from the hospital, and the follow-up call was conducted 1 week following this. Although her time to follow-up is an outlier, her scores on the other variables were not outliers, nor did she appear as a multivariate outlier. We re-ran the path model excluding her data, and the overall model and individual paths remained essentially unchanged (overall model Chi square (10) = 13.33, $p > .20$, RMSEA = .058, CFI = .96). Therefore, this mother's data were retained in the analyses.

² While mothers were completing questionnaires, the child also completed measures that are not included in this report. In addition, following the therapy session and completion of the post-treatment questionnaires, mothers and children engaged in interaction tasks. The data from these tasks is also not reported here.

² Only 0.42% of the 707 data points (i.e., 7 variables multiplied by 101 participants) were missing.

⁴ Negative value is because of the transformation of the use/liking of special play time variable.

Table 1

Sample Descriptives ($N = 101$)

Variable	Mean	SD	Range
Child's age in years	7.43	1.28	5 – 10
Mother's age in years	39.13	6.29	24 – 53
Family socioeconomic status ^a	2.57	1.17	1 – 5
Mother report of number of child symptoms ^b			
Inattentive	7.91	1.37	3 - 9
Hyperactive-Impulsive	6.93	2.43	0 – 9
Oppositional Defiant	4.77	2.57	0 - 8
Teacher report of number of child symptoms ^c			
Inattentive	6.64	2.55	0 - 9
Hyperactive-Impulsive	5.93	3.11	0 - 9
Oppositional Defiant	3.20	2.81	0 - 8
Percentages			
Child's gender			
Male	82.2		
Female	17.8		

Marital Status

Married/common-law	63.4
Divorced/separated	19.8
Single/never married	15.8

Ethnicity^d

Euro-Canadian	81.0
Asian	10.0
First Nations/Aboriginal	4.0
East Indian	2.0
African	1.0
Lebanese	1.0
Missing	1.0

^a Measured using the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975)

^b Mother and teacher ratings are on the ADHD-IV Rating Scale and the ODD Rating Scale, and symptom presence reflects a score of 2 or 3 on the 0 to 3 scale.

^c Teacher ratings were available for only 99 of the 101 children.

^d Ethnicity was not reported for one family.

Table 2

Correlations among Mothers' Parenting Cognitions, Treatment Beliefs, and Treatment Experience at Follow-Up

	1	2	3	4	5
1. Parenting Efficacy ^a	---	-.11	.29**	-.04	.25*
2. Attributions ^b	<i>-.15</i>	---	.01	.24*	-.17
3. Treatment Effectiveness ^c	.28**	<i>-.03</i>	---	.44***	.43**
4. Treatment Acceptability ^d	<i>-.03</i>	.24*	.39***	---	.19
5. Treatment Experience ^e	.29**	<i>-.13</i>	.44***	.17	---
Mean	3.82	7.08	3.98	4.67	0.00
SD	0.82	1.01	0.54	0.40	1.00

Note: values above the diagonal represent first-order correlations; italicized values below the diagonal represent partial correlations controlling for child gender, mother's age, and teacher reports of child inattentive and oppositional symptoms.

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

^a Measured using the PSOC; ^b Measured using the WAQ; ^c Measured using the PETS; ^d Measured using the TEI; ^e Factor comprising of Child Behavior Change, Use/Liking of Child-Direct Play strategies, and Use/Liking of Instructions/ Reinforcement strategies.

Figure 1

Hypothesized model of treatment beliefs as intervening variables between social cognitions and treatment experience

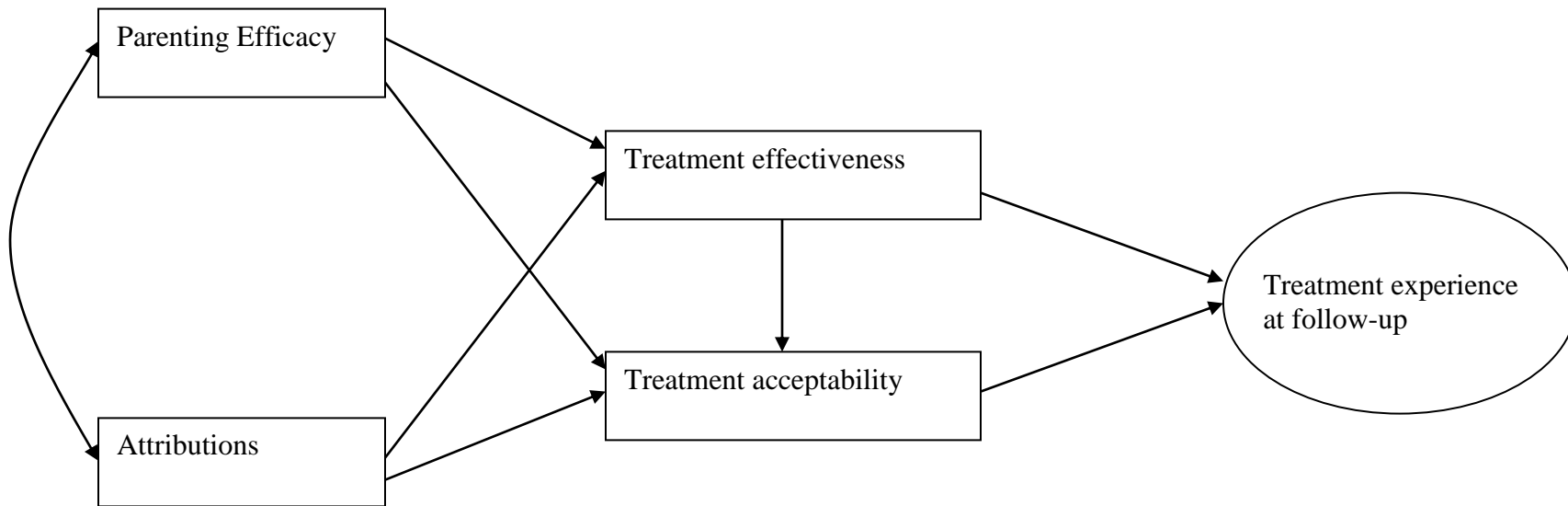
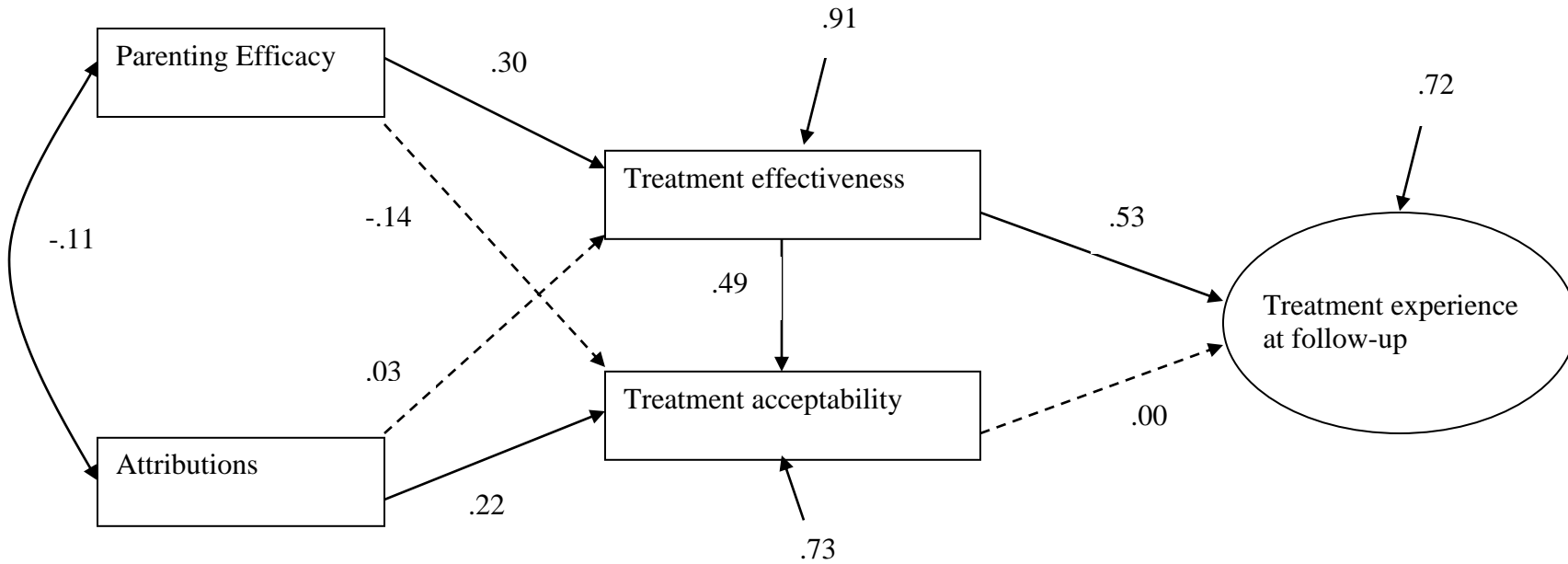


Figure 2

Final model of treatment beliefs as intervening variables between social cognitions and treatment experience



Note $p < .05$

————

----- $p > .05$

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