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Development and Preliminary Evaluation of an Integrated Treatment Targeting Parenting and Depressive Symptoms in Mothers of Children With Attention-Deficit/Hyperactivity Disorder

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Abstract

Objective—More than 50% of mothers of children with attention-deficit/hyperactivity disorder (ADHD) have a lifetime history of major depressive disorder (MDD). Maternal depressive symptoms are associated with impaired parenting and predict adverse developmental and treatment outcomes for children with ADHD. For these reasons, we developed and examined the preliminary efficacy of an integrated treatment targeting parenting and depressive symptoms for mothers of children with ADHD. This integrated intervention incorporated elements of 2 evidence-based treatments: behavioral parent training (BPT) and cognitive behavioral depression treatment.

Method—Ninety-eight mothers with at least mild depressive symptoms were randomized to receive either standard BPT ($n = 51$) or the integrated parenting intervention for ADHD (IPI-A; $n = 47$). Participants were assessed at baseline, posttreatment, and 3- to 6-month follow-up on measures of (a) self-reported maternal depressive symptoms, (b) observed positive and negative parenting, and (c) observed and mother-reported child disruptive behavior and mother-reported child and family impairment.

Results—The IPI-A produced effects of small to moderate magnitude relative to BPT on maternal depressive symptoms, observed negative parenting, observed child deviance, and child impairment at posttreatment and on maternal depressive symptoms, child disruptive behavior, child impairment and family functioning at follow-up. Contrary to expectations, the BPT group demonstrated moderate to large effects relative to IPI-A on observed positive parenting at follow-up.

Conclusions—This treatment development study provides encouraging preliminary support for the integrated intervention targeting parenting and depressive symptoms in mothers of children with ADHD. Future studies should examine whether this integrated intervention improves long-term developmental outcomes for children with ADHD.

Keywords

ADHD; maternal depression; behavioral parent training; parenting

Fifty percent of mothers of children with attention-deficit/hyperactivity disorder (ADHD) have a history of major depressive disorder (MDD), and even more experience subthreshold depressive symptoms (Chronis et al., 2003; Johnston & Mash, 2001). For children with ADHD, maternal depression predicts adverse developmental outcomes, including conduct problems, depression, and suicide attempts (Chronis et al., 2007; Chronis-Tuscano et al., 2010). Maternal depressive symptoms are also associated with poor intervention outcomes across treatment modalities (Owens et al., 2003). The link between ADHD and maternal depression may best be understood within a developmental-transactional model whereby maternal depressive symptoms and child disruptive behavior reciprocally influence one another (Nicholson, Deboeck, Farris, Boker, & Borkowski, 2011). Mothers of children with ADHD may experience depressive symptoms in part as a result of decreased environmental reinforcement associated with child misbehavior (Lewinsohn, Hoberman, Teri, & Hautzinger, 1985). Likewise, maternal depressive symptoms interfere with the effective management of child behavior (Johnston & Mash, 2001). Given that early parenting and maternal depression independently predict negative outcomes for children with ADHD (Chronis et al., 2007), it follows that treatment should target both maternal depressive symptoms and parenting to improve long-term functioning for this population.

Behavioral parent training (BPT) is an evidence-based treatment for ADHD; yet maternal depressive symptoms predict poor BPT compliance and outcomes (Pelham & Fabiano, 2008). It is for these reasons that we have integrated evidence-based adult depression

treatment with BPT. Given the often chronic and episodic course of depression, a skills-based approach may be most effective in reducing current maternal depressive symptoms and preventing MDD recurrence. A wealth of evidence exists supporting the efficacy of cognitive behavioral therapy (CBT) and, in particular, the Coping with Depression Course (CWDC) for depressed individuals and individuals at risk for depression (Cuijpers, Muñoz, Clarke, & Lewinsohn, 2009).

We developed a novel treatment that integrates BPT and the CWDC to make the application of CBT skills to parenting situations more explicit: the Integrated Parenting Intervention for ADHD (IPI-A; Chronis-Tuscano & Clarke, 2008). In this investigation, we randomly assigned mothers of children with ADHD to IPI-A or standard BPT. BPT was chosen as the active comparison condition because BPT is an evidence-based approach which is widely available in practice settings. Outcomes were evaluated across three domains: maternal depressive symptoms, parenting, and child disruptive behavior. Since our pilot study suggested that treatment effects were larger for mothers with at least mild depressive symptoms (Chronis, Gamble, Roberts, & Pelham, 2006), we selected mothers on this basis. Finally, we included observational outcome measures to circumvent possible distorted maternal reports.

Method

Participants and Procedures

Participants were recruited via mailings to local ADHD groups, schools, and health providers in the Washington, DC metropolitan area. Ninety-eight mother-child dyads participated (Figure 1). Mothers were required to have BDI-II scores of at least 10 over two administrations and were excluded on the basis of current substance abuse, psychosis, or bipolar disorder. Children met *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994) ADHD criteria, were between the ages of 6–12 years old, and had an estimated IQ of at least 70. Mothers and children on psychiatric medications were asked to remain on stable doses for at least 1 month prior to study entry;¹ psychosocial treatments were required to be suspended. Participants were recruited in five cohorts of approximately 20 participants, with half of the participants in each cohort randomly assigned to each treatment group. Randomization was stratified to ensure an equal number of children in each condition on ADHD medications.

Prospective participants were initially screened by telephone. Those meeting basic entry criteria were invited for a laboratory visit during which the Structured Clinical Interview for *DSM-IV* (SCID; First, Gibbon, Spitzer, & Williams, 1996), Schedule for Affective Disorders for School-Aged Children (Version 5; KSADS; Orvaschel & Puig-Antich, 1995), child IQ screen, and observational protocol were administered. Participants provided informed consent on a form indicating that they would receive BPT with or without a skills component related to managing mood and stress. At posttreatment and 3- to 6-month follow-up,² an interviewer blind to treatment condition administered the Longitudinal Interval

¹At baseline, 56.9% and 61.7% of children in the BPT and IPI-A groups, respectively, were taking ADHD medications. During the course of treatment, medication changes were reported for eight children in the BPT group and six children in the IPI-A group. Changes included medication dose increase ($n = 5$), starting an additional medication ($n = 3$), and changing medications ($n = 2$). At pretreatment, 23.5% and 38.3% of mothers in the BPT and IPI-A groups, respectively, were taking psychiatric medications. Among mothers in the BPT group, 17.6% were taking anti-depressants or anxiolytics, 3.9% were taking ADHD medications, and 2% were taking “other” medications. Among mothers in the IPI-A group, 25.5% were taking antidepressants or anxiolytics, and 12.8% were taking “other” medications (not intended to treat ADHD). 9.8% of mothers in the BPT group and 6.4% in the IPI-A group reported a change in medication or dosage at posttreatment.

²The number of weeks elapsed from the end of the intervention to follow-up assessments did not differ between the IPI-A and BPT groups ($M = 18.8$, $SD = 4.6$ vs. $M = 18.0$, $SD = 3.3$), $t(58) = -0.73$, $p = .465$.

Follow-up Evaluation (LIFE; Keller et al., 1987) to evaluate changes in maternal depressive symptoms since the prior assessment. The parent–child interaction was repeated and maternal report questionnaires were collected.

Measures

A comprehensive child ADHD assessment was conducted (Pelham, Fabiano, & Massetti, 2005). Symptoms were considered present if endorsed as clinically significant by the mother on the KSADS or Disruptive Behavior Disorders checklist (DBD; Pelham, Gnagy, Greenslade, & Milich, 1992), or the teacher on the DBD. Internal consistency estimates for ADHD, oppositional defiant disorder, and conduct disorder symptoms rated on the DBD were .85, .81, and .67, respectively. Parent and teacher forms of the Children's Impairment Rating Scale (IRS; Fabiano et al., 2006) were administered to ensure cross-situational impairment. The kappa for ADHD diagnoses was 0.86. The Child Behavior Checklist (Achenbach, 1991) was also completed at baseline.

Mothers were administered the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996; $\alpha = .91$) and the SCID at baseline. Based on the SCID, 20.4% of mothers met criteria for MDD at baseline. The kappa for MDD diagnoses was 1.00.

Observational tasks (clean-up, free play, homework) were coded using the Dyadic Parent–Child Interaction Coding System (3rd ed.; DPICS-III; Eyberg, Nelson, Duke, & Boggs, 2005). Intraclass correlation coefficients (ICCs) at baseline, posttreatment, and follow-up (respectively) were .92, .92, and .93 for Positive Parenting (praise, behavior descriptions, reflections, physical positive); .96, .92, and .85 for Negative Parenting (negative talk, physical negative); and .80, .91, and .79 for Child Deviance (noncompliance, negative talk, physical negative).

Treatments

Treatments were delivered in 14, 2-hr weekly group sessions (consisting of approximately 10 mothers per group) by a team of two therapists (three of whom were PhD-level clinical psychologists and three of whom were advanced doctoral students). The same therapist team administered both treatments within a cohort. Session format was primarily didactic but also incorporated group discussion, modeling, role play, and home exercises that involved practicing the behavioral parenting and/or CBT skills. During the first phase of this project, the integrated intervention was developed, piloted, and refined (Chronis-Tuscano & Clarke, 2008). The integrated format was intended to facilitate the use of CBT skills in parenting situations in an effort to directly highlight and address the negative impact of maternal depressive symptoms on parenting and consistent use of behavioral strategies. Participants in the comparison group received standard BPT following the *Defiant Children* manual (Barkley, 1997). Session topics are presented in Table 1.

An independent evaluator with basic knowledge of the treatments coded a random 10% of sessions to evaluate adherence to treatment manuals. Across conditions, 100% of the main points were covered in each session; in no instance were CBT skills raised in standard BPT.

Results

Intervention conditions did not differ on demographic or baseline measures (Table 2). Attendance across the entire sample did not differ ($t = 0.69$, $p = .489$) between IPI-A ($M = 8.8$ sessions, $SD = 4.7$) and BPT groups ($M = 8.1$ sessions, $SD = 4.7$). Among those who completed posttreatment assessments, average attendance was 10.0 (71.4%) BPT sessions and 10.0 (71.4%) IPI-A sessions. Among those who completed follow-up assessments, average attendance was 9.5 (67.9%) BPT sessions and 10.1 (72.1%) IPI-A sessions.

Attrition did not differ by condition.³ However, participants who did not complete posttreatment assessments reported lower education, $F(5) = 13.58, p = .019$, and greater child impairment (4.8 vs. 3.6), $t(85) = 2.33, p = .022$. Mothers not completing follow-up assessments were younger (37.4 vs. 41.5), $t(95) = -2.63, p = .010$, and reported greater child impairment (4.8 vs. 3.4), $t(85) = 3.00, p = .004$.

Intervention effects were compared using mixed-model analysis of covariance (ANCOVA) that nested participants within treatment groups, the unit of analysis. Baseline scores were entered as covariates for posttreatment and follow-up outcomes. Observed child deviance was included as an additional covariate in analyses of parenting outcomes to control for “child effects.” We fit models to our data with SPSS (Version 19.0) using restricted maximum likelihood. For each model, we estimated fixed effects and variance components. We report ICC values for outcome measures after entering covariates. Contingency table analyses were used to compare differential rates of MDD onset between intervention conditions.

In accordance with Schafer and Graham (2002), we used multiple imputations (MI) to account for missing data. We generated 20 complete data sets per intervention condition using all outcomes as predictors of missing values. We then fit the mixed-model ANCOVAs to each of the 20 imputed data sets and reported the pooled estimates calculated within SPSS. MI can be viewed as an intent-to-treat approach because all randomized participants are included in the analysis.

Because this was a treatment development study with only five treatment groups per condition, we lacked the statistical power necessary to detect clinically significant effects. Thus, we computed Hedges' *g* (Hedges, 1981) to ease the interpretation of results. Hedges' *g*, recommended by the What Works Clearing-house (Seftor et al., 2011), represents an effect size comparable to Cohen's *d*, except that Cohen's *d* uses the sample standard deviation while Hedges' *g* uses the population standard deviation (Rosenthal & Rosnow, 2008). We only interpret fixed effects with an absolute value of Hedges' *g* greater than 0.2, indicating at least a small effect (0.2, 0.5, and 0.8 correspond to small, medium, and large effects, respectively).

Table 3 provides pooled means across the 20 imputed data sets, standard deviations, and sample sizes for each outcome by assessment time and condition. Examination of skewness and kurtosis values for the outcome measures revealed that all outcomes were within the ± 1.0 range. Baseline to posttreatment and to follow-up outcome analyses are summarized in Tables 4 and 5, respectively. From baseline to posttreatment, small to moderate effects of IPI-A over BPT were obtained on the BDI-II ($t = -1.06, p = .294, \text{Hedges' } g = -.40$), observed negative parenting ($t = -2.27, p = .024, \text{Hedges' } g = -.56$), observed child deviance ($t = -2.46, p = .014, \text{Hedges' } g = -.52$), and overall child impairment ($t = -0.80, p = .424, \text{Hedges' } g = -.27$). From baseline to follow-up, small to moderate effects of IPI-A over BPT were found on the BDI-II ($t = -1.22, p = .225, \text{Hedges' } g = -.30$), overall child impairment ($t = -1.09, p = .278, \text{Hedges' } g = -.34$), child DBD symptoms ($t = -0.78, p = .436, \text{Hedges' } g = -.20$), and IRS family impairment ($t = -1.09, p = .277, \text{Hedges' } g = -.35$). Moderate to large effects of BPT over IPI-A were found on observed positive parenting ($t = -2.15, p = .063, \text{Hedges' } g = -.75$) at follow-up.

No differences were found between BPT and IPI-A participants with respect to total time depressed over the duration of the study, $M = 1.84$ months, $SD = 3.07$ vs. $M = 1.30$ months,

³Rates of missing data ranged from 0% to 25% at baseline, 31% to 54% at posttreatment, and 39% to 69% at follow-up. There were no significant interactions between attrition and condition.

$SD = 2.36$; $t(54) = 0.73$, $p = .466$, $\eta^2 = .010$. Among the 79.6% of participants without current MDD at baseline, onset rates were 7.1% for the BPT group and 2.8% for the IPI-A group.

Differential rates of reliable improvement in child DBD symptoms occurred between the IPI-A and BPT participants from baseline to follow-up (34.6% vs. 11.8%, respectively), $F(1, n = 60) = 4.53$, $p = .033$. In other words, participants in the IPI-A condition were more likely to experience reliable decreases in DBD symptoms. No other outcomes displayed differential rates of reliable change between the IPI-A and BPT participants from baseline to posttreatment or baseline to follow-up. As another estimate of clinical significance, we calculated the percentage of participants scoring below the clinical cutoff of 10 on the BDI-II (indicating mild depression) at posttreatment and follow-up. A larger percent of IPI-A participants scored below the clinical cutoff on the BDI-II at posttreatment compared to BPT participants (80.0% vs. 59.5%), $F(1) = 3.25$, $p = .072$. From baseline to follow-up, 55.9% of the BPT group and 76.9% of the IPI-A group moved into the nonclinical range on the BDI-II, $F(1) = 2.87$, $p = .090$.

Discussion

Evidence demonstrating that maternal depressive symptoms and parenting predict developmental and treatment outcomes for children with ADHD provide a strong rationale for an integrated intervention which simultaneously targets parenting and maternal depressive symptoms. Consistent with recent work suggesting a lasting positive impact of maternal depression treatment on off-spring diagnostic status (Wickramaratne et al., 2011), preliminary findings from this treatment development study suggest that our integrated treatment resulted in improvements beyond standard BPT in key outcome domains.

At posttreatment, IPI-A produced improvements of small to moderate magnitude relative to BPT in maternal depressive symptoms, observed negative parenting, observed child deviance, and overall child impairment. In a prospective, longitudinal study, maternal depression and parenting were the most robust predictors of the developmental course of conduct problems among children with ADHD (Chronis et al., 2007). Maternal MDD diagnoses also predicted child MDD and suicide attempts (Chronis-Tuscano et al., 2010). Thus, this integrated intervention has the potential to impact the development of very serious comorbidity involving high societal cost (Lynam, 1996).

At follow-up, small effects of IPI-A beyond BPT on maternal depressive symptoms, child disruptive symptoms, and child and family impairment were found. Lasting effects on maternal depressive symptoms, child symptoms and impairment are critically important for the reasons described above. Ideally, sustained effects would also be found on parenting. Instead, we found that the BPT group displayed small beneficial effects beyond IPI-A on observed positive parenting at follow-up. These were unexpected findings that may have occurred for any number of reasons. One possibility is that standard BPT allowed for a more reasonable pace of behavioral treatment (e.g., slower presentation of material, more examples and opportunity for discussion, fewer skills to practice and master), particularly for mothers experiencing depressive symptoms. It is also important to remember that existing evidence-based ADHD interventions have unfortunately not demonstrated lasting effects (Molina et al., 2009), supporting the argument that ADHD is a chronic disorder requiring long-term treatment. For chronic conditions such as ADHD, ongoing treatment or at least some form of maintenance treatment is likely required. At the same time, it remains promising that longer-term effects of IPI-A beyond BPT were found on several key outcome measures at follow-up.

Although these preliminary results are quite encouraging, this brief report describes a treatment development study with a limited sample size. In some ways, our attrition rate and degree of missing data appear large; however, prior studies have reported average attrition rates from BPT of 50% (e.g., Miller & Prinz, 1990), and in this study we selected mothers on the basis of one of the most robust predictors of BPT dropout, maternal depressive symptoms. Despite this, our attrition rates were somewhat lower than what has been reported in the BPT literature. Still, the limited sample size nested within a relatively small number of treatment groups, combined with the rigorous comparison condition, precluded our ability to evaluate statistical significance and likely impacted our ability to detect reliable change. Other limitations include the lack of teacher-rated outcome measures or measures of paternal psychopathology, our decision to not include fathers in treatment, and the fact that more impaired children and less educated families were less likely to complete outcome measures.

At the same time, several aspects of the study design give us confidence in results favoring the IPI-A. We compared the IPI-A to an already-established treatment, for both methodological and ethical reasons. BPT has been found in other studies to reduce maternal depressive symptoms (although maternal depression predicts BPT attrition and response; Owens et al., 2003). This comparison condition thus provided an extremely stringent test of the IPI-A. Additionally, we attempted to equate the two treatment conditions on factors other than CWDC skills (e.g., therapist contact time), carefully measured treatment fidelity, and collected observational outcome measures. Given these methodological strengths, the fact that IPI-A demonstrated improvements beyond standard BPT in key domains gives us confidence that true benefits exist.

Future large-scale studies evaluating the IPI-A should consider intervening with children earlier in development and include an extended follow-up period to examine longer term effects on developmental outcomes including both internalizing and externalizing symptoms. Future research can also elucidate mediators (e.g., engagement in pleasant activities, parenting cognitions, maternal depressive symptoms) and moderators (e.g., severity/course of maternal depressive symptoms and MDD, maternal ADHD, paternal depression, child age, and concurrent medication) of treatment response. Given the dense and lengthy format of the integrated intervention, an in-depth examination of active treatment components may also allow for the development of a more streamlined, yet effective version of the intervention. Finally, it will be critical to enhance long-term effects of the IPI-A for this treatment-resistant population.

The powerful work of Wickramaratne et al. (2011) demonstrating that remission of maternal depression after antidepressant treatment was associated with decreased onset and increased remission of child internalizing and externalizing disorders amply demonstrates the importance of treating maternal depression to enhance child outcomes. For children with ADHD, maternal depression is common and robustly associated with poor developmental and treatment outcomes. The fact that the novel integrated intervention examined herein demonstrated benefits beyond existing evidence-based treatment on maternal depression, parenting, child behavior, and child/family impairment provides great promise in this line of research.

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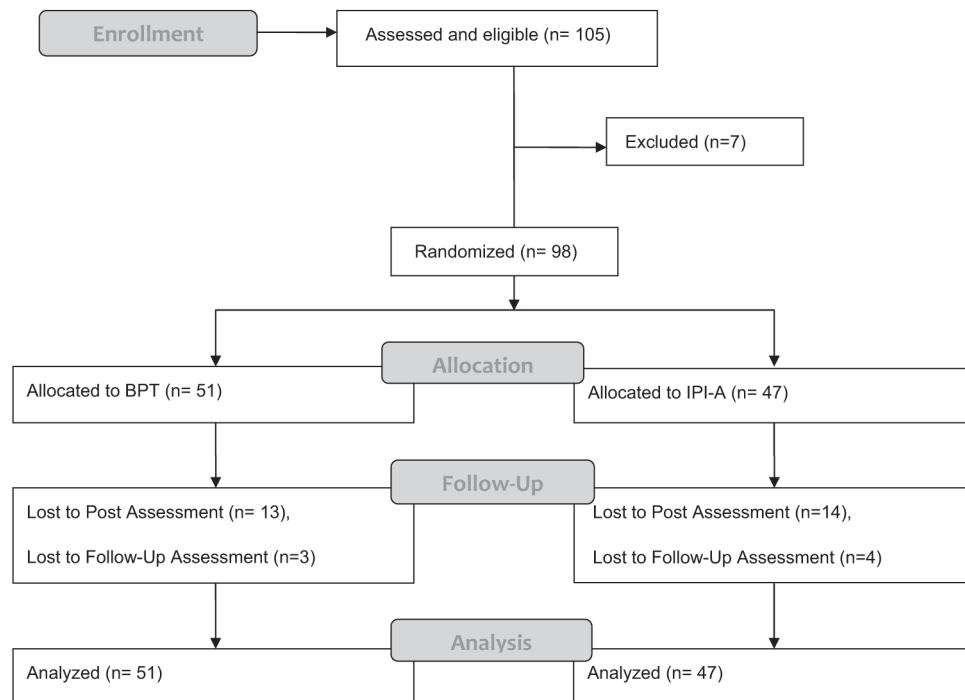


Figure 1. Participant flow. BPT = behavioral parent training; IPI-A = Integrated Parenting Intervention for ADHD (Chronis-Tuscano & Clarke, 2008); ADHD = attention-deficit/hyperactivity disorder.

Table 1

Session Content

| Session | Standard Behavioral Parent Training | Integrated Parent Intervention (<i>CWDC Skills in italics</i>) |
|---------|---|---|
| 1 | Psychoeducation about child misbehavior: Child, parent, environmental characteristics | Psychoeducation about child misbehavior <i>Mood Monitoring: How does your mood affect parenting?</i> |
| 2 | Special time with child: Improving Relationship Differential Attending/Ignoring | <i>Social learning model of depression: Relationship between thoughts, feelings, behaviors</i> |
| 3 | Giving Commands/Increasing Compliance | Special time with child: Improving Relationship/ <i>Increasing pleasant activities alone/with child</i> |
| 4 | House Rules Structure/Routines Increasing Parental Monitoring | Preparation for Positive Parenting Strategies: <i>Constructive Thinking: Recognizing & Changing parenting cognitive distortions; Increasing positive/decreasing negative thoughts about child</i> |
| 5 | Home Token/Point System I: Rewards | Differential Attending/Ignoring I: Praise <i>Constructive Thinking; Increased focus on positive aspects of child</i> |
| 6 | Home Token/Point System II: Response Cost Time Out I: Time Out Basics | Differential Attending/Ignoring II: Ignoring <i>Relaxation Techniques</i> |
| 7 | Time Out II: Extending Time Out to other Misbehavior | Preparation for Punishment Techniques: <i>Social Skills & Assertiveness Training</i> |
| 8 | Managing Misbehavior in Public Places | Giving Commands/Increasing Compliance/ <i>Assertiveness Training</i> |
| 9 | Misbehavior at School Daily School Behavior Report Card | House Rules/Structure/Routines Increasing Parental Monitoring <i>Time Management/Setting Priorities</i> |
| 10 | Anticipating Future Behavior Problems | Home Token/Point System: Rewards & Response Cost |
| 11 | Peer Programming in Home and School (e.g., Setting up play dates)* | Time Out <i>Assertiveness Training (review & application)</i> <i>Relaxation Techniques (review & application)</i> |
| 12 | Parental Support with Homework* | Managing Misbehavior in Public Places <i>Relaxation Techniques (review & application)/Planning Ahead</i> |
| 13 | Troubleshooting Daily School Behavior Report Card* | Misbehavior at School/Daily School Behavior Report Card <i>Social Skills/Assertiveness Training (review & application)/Constructive Thinking (review & application)</i> |
| 14 | Review & Wrap-Up | Review & Wrap-Up |

Note. CWDC = Coping with Depression Course (Cuijpers, Munoz, Clarke, & Lewinsohn, 2009). Asterisks indicate that data were supplemented from the Multi-Modal Treatment Study for ADHD Parent Training Manual (Abikoff et al., 1994).

Table 2

Baseline Demographics and Outcomes by Condition

| Variable | IPI-A (n = 47) | BPT (n = 51) | Test statistic | p |
|---------------------------------|----------------|--------------|----------------|------|
| Child's gender n (%) | | | 0.25 | .616 |
| Male | 30 (63.8) | 35 (68.6) | | |
| Female | 17 (36.2) | 16 (31.4) | | |
| Child's average grade n (%) | | | 1.10 | .776 |
| A | 11 (23.4) | 10 (19.6) | | |
| B | 12 (25.5) | 18 (35.3) | | |
| C | 11 (23.4) | 13 (25.5) | | |
| D or below | 5 (10.6) | 4 (7.8) | | |
| Race n (%) | | | 0.64 | .727 |
| Caucasian | 24 (51.1) | 24 (47.1) | | |
| African American | 15 (31.9) | 15 (29.4) | | |
| Other | 8 (17.0) | 12 (23.5) | | |
| Education n (%) | | | 5.48 | .361 |
| High school or less | 6 (12.8) | 4 (7.8) | | |
| Some college | 16 (34.0) | 10 (19.6) | | |
| Bachelor's degree | 12 (25.5) | 17 (33.3) | | |
| Master's degree | 7 (14.9) | 9 (17.6) | | |
| Doctorate | 5 (10.6) | 5 (9.8) | | |
| Other | 1 (2.1) | 5 (9.8) | | |
| Marital status n (%) | | | 0.79 | .675 |
| Never married | 4 (8.5) | 7 (13.7) | | |
| Married | 31 (66.0) | 32 (62.7) | | |
| Separated/divorced/widowed | 12 (25.5) | 11 (21.6) | | |
| MDD episode after intake n (%) | | | 1.84 | .175 |
| No | 45 (95.7) | 45 (88.2) | | |
| Yes | 2 (4.3) | 6 (11.8) | | |
| Child's age M (SD) | 8.5 (2.1) | 9.0 (2.1) | 1.22 | .224 |
| Child diagnostic status n (%) | | | | |
| ADHD-Inattentive Type | 9 (19.1) | 13 (25.5) | | |
| ADHD-H/I Type | 0 (0.0) | 2 (3.9) | | |
| ADHD Combined Type | 38 (80.9) | 35 (68.6) | | |
| ODD | 15 (49.0) | 25 (49.0) | | |
| Conduct disorder | 12 (25.5) | 13 (25.5) | | |
| Child Behavior Checklist M (SD) | | | | |
| Internalizing T score | 60.0 (10.0) | 62.7 (9.9) | 1.31 | .192 |
| Externalizing T score | 63.5 (10.5) | 64.6 (11.3) | 0.48 | .636 |
| Participant's age M (SD) | 39.0 (7.7) | 41.1 (7.2) | 1.41 | .162 |
| Annual family income M (SD) | 111.0 (56.7) | 116.7 (72.9) | 0.38 | .705 |
| Outcomes M (SD) | | | | |

| Variable | IPI-A (<i>n</i> = 47) | BPT (<i>n</i> = 51) | Test statistic | <i>p</i> |
|--------------------------|------------------------|----------------------|----------------|----------|
| BDI | 21.5 (9.3) | 24.5 (11.4) | 1.42 | .159 |
| Positive parenting | 4.9 (4.2) | 4.5 (5.2) | -0.30 | .762 |
| Negative parenting | 4.0 (3.5) | 5.4 (4.2) | 1.52 | .132 |
| Child deviance | 3.3 (3.6) | 5.2 (4.9) | 1.98 | .052 |
| Overall child impairment | 3.7 (2.4) | 4.1 (2.0) | 0.78 | .435 |
| DBD symptoms | 18.9 (6.4) | 18.9 (6.7) | 0.01 | .994 |
| Family impairment | 3.8 (2.0) | 3.8 (2.0) | 0.17 | .862 |

Note. IPI-A = Integrated Parenting Intervention for ADHD (Chronis-Tuscano & Clarke, 2008); BPT = behavioral parent training; ADHD = attention-deficit/hyperactivity disorder; MDD = major depressive disorder; H/I = hyperactive/impulsive; ODD = oppositional defiant disorder; BDI = Beck Depression Inventory-II (Beck, Steer, & Brown, 1996); DBD = disruptive behavior disorder. Contingency table analyses and independent observation *t* tests were conducted.

Table 3
Pooled Descriptive Statistics for Imputed Outcome Measures by Condition and Assessment Time

| Measure | IPI-A (n = 47) | | | BPT (n = 51) | | |
|--------------------------|-----------------|----------------------|------------------|-----------------|----------------------|------------------|
| | Baseline M (SD) | Posttreatment M (SD) | Follow-up M (SD) | Baseline M (SD) | Posttreatment M (SD) | Follow-up M (SD) |
| BDI-II | 21.5 (9.3) | 8.1 (7.6) | 9.1 (8.1) | 24.5 (11.3) | 11.8 (8.3) | 12.3 (9.9) |
| Positive parenting | 4.9 (3.7) | 7.4 (5.7) | 4.2 (2.7) | 4.5 (4.8) | 8.2 (5.8) | 7.1 (4.8) |
| Negative parenting | 4.0 (3.1) | 1.8 (1.4) | 2.9 (2.1) | 5.5 (3.9) | 3.4 (2.2) | 3.1 (1.9) |
| Child deviance | 3.3 (3.2) | 1.9 (1.3) | 3.3 (1.8) | 5.3 (4.5) | 4.8 (5.0) | 3.1 (1.3) |
| Overall child impairment | 3.6 (2.4) | 3.7 (1.6) | 3.0 (1.9) | 4.0 (2.0) | 4.1 (1.3) | 3.6 (1.5) |
| DBD symptoms | 18.9 (6.4) | 12.4 (5.9) | 11.5 (6.4) | 18.9 (6.7) | 13.6 (7.6) | 12.9 (7.7) |
| Family impairment | 3.6 (2.0) | 3.1 (1.9) | 2.7 (1.7) | 3.7 (2.0) | 3.3 (1.7) | 3.3 (1.8) |

Note. IPI-A = Integrated Parenting Intervention for ADHD (Chronis-Tuscano & Clarke, 2008); BPT = behavioral parent training; M = pooled mean; SD = average standard deviation across twenty imputed datasets; BDI-II = Beck Depression Inventory-II (Beck, Steer, & Brown, 1996); DBD = disruptive behavior disorder; ADHD = attention-deficit/hyperactivity disorder.

Table 4

Fixed Effect and Variance Component Estimates From a Mixed-Model Analysis of Covariance to Test Effects for the IPI-A Condition Compared to the BPT Condition From Baseline to Posttreatment

| Effect or statistic | BDI-II ^a | Positive Parenting ^b | Negative Parenting ^b | Child Deviance ^a | Overall Child Impairment ^a | DBD Symptoms ^a | Family Impairment ^a |
|--------------------------------------|---------------------|---------------------------------|---------------------------------|-----------------------------|---------------------------------------|---------------------------|--------------------------------|
| Fixed effects | | | | | | | |
| Intercept | 7.18 ** (2.63) | 6.49 *** (1.46) | 2.08 *** (.49) | 2.19 ** (.74) | 3.82 *** (0.43) | 6.91 ** (2.60) | 2.67 *** (0.56) |
| Condition | -3.15 (2.96) | -0.96 (1.43) | -1.04* (0.46) | -1.91* (0.77) | -0.39 (0.48) | -1.20 (2.10) | -0.27 (0.61) |
| Covariate (a) | .19* (.09) | .42** (.14) | .17* (.07) | .49*** (.09) | .06 (.10) | .35** (.13) | .18 (.12) |
| Covariate (b) | | -.13 (.20) | -.05 (.07) | | | | |
| Covariate (c) | | .09 (.20) | .13* (.06) | | | | |
| Variance components | | | | | | | |
| Residual (σ^2) ^c | 60.35 (13.81) | 29.52 (4.84) | 2.89 (.56) | 10.07 (1.62) | 2.01 (0.41) | 42.17 (8.75) | 3.12 (0.58) |
| Group (σ^2) | 1.31 (4.55) | 1.14 (2.44) | 0.08 (0.19) | 0.12 (0.47) | 0.08 (0.17) | 0.00 (0.00) | 0.09 (0.22) |
| Summary statistics | | | | | | | |
| ICC, | .053 | .033 | .096 | .064 | .052 | .019 | .033 |
| Hedges' g ^d | -.395 | -.166 | -.559 | -.515 | -.271 | -.175 | -.149 |

Note. IPI-A = Integrated Parenting Intervention for ADHD (Chronis-Tuscano & Clarke, 2008); BPT = behavioral parent training; BDI-II = Beck Depression Inventory-II (Beck, Steer, & Brown, 1996); DBD = disruptive behavior disorder; ICC = intraclass correlation; ADHD = attention-deficit/hyperactivity disorder. Table entries show fixed effects and variance components with standard errors in parentheses. Condition was coded such that BPT = 0 and IPI-A = 1. Tests of fixed effects used 8 degrees of freedom for BDI-II, child impairment, DBD symptoms, and family impairment. Tests of fixed effects for the other outcomes used 6 degrees of freedom. Covariate (a) represents the outcome measure collected at baseline. Covariates (b) and (c) represent child deviance at baseline and post-treatment to control for child effects.

^a Lower score is better.

^b Higher score is better.

^c Significance test not conducted.

^d A positive g value indicates the score was greater in the IPI-A group compared to the BPT group after controlling for baseline.

* $p = .05$.

** $p = .01$.

*** $p = .001$.

Table 5

Fixed Effect and Variance Component Estimates From a Mixed-Model Analysis of Covariance to Test Effects for the IPI-A Condition Compared to the BPT Condition From Baseline to Follow-Up

| Effect or statistic | BDI-II ^a | Positive Parenting ^b | Negative Parenting ^b | Child Deviance ^d | Overall Child Impairment ^d | DBD Symptoms ^d | Family Impairment ^d |
|--------------------------------------|---------------------|---------------------------------|---------------------------------|-----------------------------|---------------------------------------|---------------------------|--------------------------------|
| Fixed effects | | | | | | | |
| Intercept | 7.89* (3.10) | 5.85*** (1.49) | 2.44** (0.76) | 3.23*** (0.39) | 3.62*** (0.58) | 6.09* (2.55) | 3.03*** (0.55) |
| Condition | -2.70 (2.21) | -2.96* (1.19) | -0.07 (0.57) | 0.18 (.46) | -0.59 (0.54) | -1.41 (1.81) | -0.62 (0.57) |
| Covariate (a) | .18 (.12) | .19 [†] (.10) | .16* (.07) | -.02 (.05) | -.01 (.13) | .36** (.13) | .08 (.12) |
| Covariate (b) | | -.02 (.12) | -.06 (.08) | | | | |
| Covariate (c) | | .14 (.29) | .02 (.16) | | | | |
| Variance components | | | | | | | |
| Residual (σ^2) ^c | 19.88 (15.04) | 14.11 (2.33) | 3.42 (0.64) | 2.36 (0.47) | 2.88 (0.59) | 45.56 (9.03) | 3.02 (0.52) |
| Group (σ^2) | 0.09 (1.22) | 1.49 (1.67) | 0.32 (0.39) | 0.12 (0.21) | 0.16 (0.28) | 0.15 (1.52) | 0.12 (0.24) |
| Summary statistics | | | | | | | |
| ICC, | .026 | .200 | .067 | .031 | .072 | .008 | .064 |
| Hedges' g^d | -.297 | -.746 | -.035 | .115 | -.341 | -.198 | -.352 |

Note. IPI-A = Integrated Parenting Intervention for ADHD (Chronis-Tuscano & Clarke, 2008); BPT = behavioral parent training; BDI-II = Beck Depression Inventory-II (Beck, Steer, & Brown, 1996); DBD = disruptive behavior disorder; ICC = intraclass correlation; ADHD = attention-deficit/hyperactivity disorder. Table entries show fixed effects and variance components with standard errors in parentheses. Condition was coded such that BPT = 0 and IPI-A = 1. Tests of fixed effects used 8 degrees of freedom for BDI-II, child impairment, DBD symptoms, and family impairment. Tests of fixed effects for the other outcomes used 6 degrees of freedom. Covariate (a) represents the outcome measure collected at baseline. Covariates (b) and (c) represent child deviance at baseline and follow-up to control for child effects.

^a Lower score is better.

^b Higher score is better.

^c Significance test not conducted.

^d A positive g value indicates the score was greater in the IPI-A group compared to the BPT group after controlling for baseline.

[†] $p = .10$.

* $p = .05$.

** $p = .01$.

*** $p = .001$.