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## A Novel Group Therapy for Children with ADHD and Severe Mood Dysregulation

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### Abstract

**Objective**—No psychosocial treatments have been developed for children with Attention-Deficit/Hyperactivity Disorder (ADHD) and Severe Mood Dysregulation (SMD) despite the significant prevalence and morbidity of this combination. Therefore, the authors developed a novel treatment program for children with ADHD and SMD.

**Method**—The novel therapy program integrates components of cognitive behavioral therapies for affect regulation with a parent training intervention for managing recurrent defiant behaviors. It consists of nine 105-minute child and parent groups run in unison. A pilot trial was conducted with seven participants with ADHD and SMD ages 7-12 who were on a stable stimulant regimen.

**Results**—Six of the seven (86%) families completed the program. Participants showed large improvements in depressive symptoms, mood lability, and global functioning. Milder improvements in externalizing behaviors were observed.

**Conclusion**—Results suggest the feasibility and potential efficacy of the therapy program for children with ADHD and SMD and warrant a larger controlled trial.

### Keywords

ADHD; Severe Mood Dysregulation; Parent Training; Cognitive Behavioral Therapy

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An increasing percentage of children with Attention-Deficit/Hyperactivity Disorder (ADHD) is being diagnosed with Bipolar Disorder (BP) or Major Depression (MDD) (Blader & Carlson, 2007; Daviss, 2008; Moreno et al., 2007). This diagnostic trend has been associated with a significant increase in the use of mood stabilizing, antipsychotic, and antidepressant medications in children with ADHD (Comer, Olfson, & Mojtabai, 2010;

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This study was completed at the University of Buffalo Center for Children and Families (CCF). Dr. Waxmonsky, Dr. Akinnusi, and Dr. Haak were with the Department of Psychiatry, Dr. Pelham with the Department of Pediatrics and Psychology, Dr. Waschbusch with the Department of Pediatrics, Dr. Fabiano and Mrs. Pariseau are with the Department of Counseling, School and Educational Psychology, Dr. Wymbs with the Department of Psychology, and Mr. Belin worked directly for the CCF. Since completion of the study, Dr. Waxmonsky, Dr. Waschbusch, Dr. Babocsai, and Dr. Pelham along with Mr. Belin have relocated to Florida International University (FIU) whereas Mrs. Wymbs has moved to the University of Washington.

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Parens, Johnston, & Carlson, 2010). However, most children with ADHD and emotion dysregulation lack distinct mood cycles considered to be the hallmark symptoms of BP or sustained periods of depression, suggestive of MDD (Brotman et al., 2006; Carlson, 2009; McClellan, 2005; Pavuluri, Birmaher, & Naylor, 2005). Moreover, researchers have theorized that emotional instability is a core deficit in ADHD (Martel, 2009; Skirrow, McLoughlin, Kuntsi, & Asherson, 2009), suggesting that affective instability by itself in a child with ADHD does not automatically indicate the presence of a comorbid mood disorder.

To address the diagnostic controversy surrounding children with persistent irritability that predictably overreact to stressors, the National Institute of Mental Health (NIMH) created the construct of Severe Mood Dysregulation (SMD) to describe such children who do not meet criteria for a formal mood disorder (Leibenluft, Charney, Towbin, Bhangoo, & Pine, 2003). According to the NIMH definition, SMD consists of 1) a persistently abnormally irritable or sad mood, 2) developmentally inappropriate levels of reactivity to stimuli three or more times per week, and 3) evidence of persistent hyperarousal that begins prior to the age of 12. Furthermore, these symptoms must cause cross domain impairment and persist for at least 12 months with no more than 60 days of symptom free functioning. A modified version of SMD that does not require hyperarousal is now being field tested for inclusion in the Fifth Edition of the Diagnostic and Statistical Manual (DSM-V), highlighting the increased recognition of this construct (<http://www.dsm5.org>).

Prior work has found that children with ADHD and SMD experience greater morbidity than children with only externalizing behavior disorders and are in need of specialized treatments to optimize their functioning (Anastopoulos et al., 2011; Galanter et al., 2003; Waxmonsky et al., 2008). Youth with ADHD and SMD exhibit high rates of aggression, prominent affective lability, and hostile interpretation of neutral stimuli that disrupt school, home, and peer relations (Dienes, Chang, Blasey, Adleman, & Steiner, 2002; Jensen et al., 2007; Leibenluft, Blair, Charney, & Pine, 2003; Pavuluri et al., 2005; Post & Kowatch, 2006; Quiggle, Garber, Panak, & Dodge, 1992). In the Multimodal Treatment Study of ADHD (MTA Study), the 10% of children with SMD-like mood dysregulation had higher baseline levels of ADHD, Oppositional Defiant Disorder (ODD), anxiety, and depressive symptoms as rated by parents and teachers than children without prominent mood dysregulation (Galanter et al., 2003). Most of these baseline differences persisted after intensive multimodal treatments for ADHD, suggesting the need for additional treatment beyond stimulants and behavior modification therapy for ADHD (Galanter et al., 2003; Galanter et al., 2005; Jensen et al., 2007). Others have also reported that children with ADHD plus SMD-like presentations were more impaired at home, at school, and in their peer relationships compared to children with ADHD and ODD (Anastopoulos et al., 2011; Carlson, Loney, Salisbury, & Volpe, 1998; Carlson & Youngstrom, 2003). These children are also more likely to present for treatment than ADHD youth without SMD (Anastopoulos et al., 2011), suggesting the need to develop specific treatments for this subset of ADHD youth.

To date, little research has focused on the treatment of SMD, despite its prevalence and associated morbidity, leading to a call for treatment trials specifically for SMD (Parens,

Johnston, & Carlson, 2010; Stringaris et al., 2010). Stimulant medications are efficacious for improving ADHD and related aggressive behaviors (Connor, Glatt, Lopez, Jackson, & Melloni, 2002; Pliszka, 2007) making them a potential treatment for children with ADHD and SMD. However, concern exists that stimulants could induce mania, especially in mood-labile youth (Carlson, 2009; Delbello et al., 2001). The one study to date examining the effect of stimulants in children with ADHD and SMD found them to be safe and effective for improving ADHD symptoms (Waxmonsky et al., 2008). However, youth with ADHD and SMD on optimized doses of stimulants continued to exhibit elevated levels of affective dysregulation and defiant behaviors compared to youth with ADHD and ODD that did not meet criteria for SMD (Waxmonsky et al., 2008).

Mood-stabilizing and antipsychotic medications have been used for pediatric BP (Delbello, Schwiers, Rosenberg, & Strakowski, 2002; Findling et al., 2009; Tohen et al., 2007) and increasingly are used off-label to treat irritability and aggression. It has been proposed that the lack of evidenced-based interventions for SMD has contributed to the high rates of polypharmacy in children, especially amongst those with ADHD (Comer et al., 2010; Olfson, Crystal, Huang, & Gerhard, 2010; Parens et al., 2010). There has been little systematic research documenting their effectiveness in youth with SMD who do not have a formal mood disorder (IMS Health, 2011). The only placebo-controlled medication trial in children with SMD found no benefit of lithium over placebo (Dickstein et al., 2009).

Most children with this diagnostic presentation exhibit a mixture of persistent oppositional behaviors and impulsive aggression along with symptoms of ADHD (Stringaris et al., 2010). Psychosocial interventions are well established treatments for each of these constructs (Pelham & Fabiano, 2008; Eyberg, Nelson, & Boggs, 2008). However, even intensive, evidence-based programs for externalizing behavior disorders may be insufficient to address the complex mix of internalizing and externalizing symptoms seen in children with ADHD and SMD. For example, Waxmonsky and colleagues (2008) observed that children with ADHD and SMD continue to show significant impairments after completing an intensive 8-week therapeutic summer camp targeting symptoms of ADHD and ODD. In addition, concerns have been raised that traditional behavioral parent training (BPT) programs for ADHD and ODD may need to be modified for youth with labile moods. Specifically, these programs need to address the effect of mood on behavior while avoiding placing blame on parents or children for endogenous mood states that are beyond their control (Mackinaw-Koons & Fristad, 2004).

The literature suggests the potential efficacy of several improvements to standard BPT for children with ADHD and SMD. Specifically, integration of techniques from cognitive-behavioral programs for pediatric mood disorders may potentially benefit youth with SMD as they have been found to be an efficacious treatment for pediatric mood disorders. Programs such as Child and Family-Focused Cognitive-Behavioral Therapy (CBT), which include parent and child groups focused on stabilizing routine, increasing family support to reduce stressors, monitoring affect, and improving emotion regulation have led to significant improvements in ADHD and mood symptoms as well as global functioning in children with BP (Pavuluri et al., 2004). Fristad's Multi-Family Psychoeducation Groups (MFPG) employ a group-based CBT model emphasizing self-monitoring of affect, improving emotion

regulation skills, and effective problem solving techniques along with a psychoeducation component for parents that addresses the connection between mood and behavior. Under controlled settings, MFPG produced improved symptom control in pre-pubertal children with MDD or BP (Fristad, Verducci, Walters, & Young, 2009).

Social-cognitive programs primarily targeting anger management have been developed to improve impulse control, increase perspective-taking, and instill insight/judgment. These programs have been found to reduce rates of physical aggression and improve self-esteem in school-aged children (Lochman, Whidby, & Fitzgerald, 2000). They also enhance children's capacity to recognize the physical signs of anger in themselves and others, which has been found to be impaired in youth with SMD (Brotman et al., 2010; Guyer et al., 2007).

A group-based psychosocial treatment that integrates evidence-based techniques of behavior modification, anger management, and cognitive-behavioral therapy programs to target oppositional behaviors and mood symptoms may offer significant benefit for children with ADHD and SMD. First, children with ADHD and SMD present with a complex mix of internalizing and externalizing symptoms, suggesting the need for an integrative, multimodal therapy. Second, there may be synergistic value in an integrated therapy especially if the proposed treatment targets the whole family. In the National Comorbidity Survey, maladaptive family functioning was identified as one of the strongest and most amendable predictors of mental illness, particularly for mood disorders (Green et al., 2010; McLaughlin et al., 2010). Thus, Green et al. and McLaughlin et al. concluded that maladaptive family functioning should be a major target of primary prevention efforts. Therefore, a psychosocial treatment that actively engages parents as well as children may prevent the emergence of future mood symptoms in children at risk for affective illness in addition to treating youths' current impairments (Miklowitz, Biuckians, & Richards, 2006).

In an effort to provide a treatment tailored to the needs of children with ADHD and SMD, we combined behavioral parent and child training techniques from Cunningham, Bremner, and Secord-Gilbert's (1998) Community Parenting Education Program (COPE) to address behavioral dysregulation with techniques from Lochman, Wells, and Lenhart's (2008) Coping Power and Fristad's (1998) Multifamily Psychoeducation Groups to address emotional dysregulation. Content of parent sessions paralleled that of child sessions to promote joint application of learned skills across the whole family. The open-label pilot study of this program represents the first psychosocial trial specifically for SMD held in a traditional outpatient setting. This manuscript details the core therapy components for this difficult to treat subpopulation of ADHD youth as well as initial efficacy and feasibility findings.

## Method

### Participants

Children with ADHD and SMD ages 7 to 12 were recruited primarily from the outpatient child mental health clinic of a local academic medical center. Seven families enrolled in the nine-week open pilot trial. The average age of the child participants was 8.7 years ( $SD = 1.6$ ). All child participants were male and 4 (57%) were Caucasian. All of the participating

children took stimulant medication for ADHD and all but two participants were currently receiving counseling services at the time of entry (four office-based, one school-based). Two participants met criteria for Separation Anxiety Disorder in addition to ADHD and SMD. Additional demographic, educational, and treatment history are presented in Table 1.

## Procedure

Interested families completed an initial phone screening that assessed potential eligibility. Informed consent was obtained during the first in-person visit and a diagnostic assessment was conducted to confirm ADHD and SMD (see below). All study procedures were approved by the local institutional review board.

It was required that participants met criteria for the combined subtype of ADHD as this subtype is associated with the greatest level of impairment including the highest rates of oppositional behaviors (Lubke et al., 2007). To assess ADHD and document that children exhibited the persistent hyperarousal required for SMD, parents were interviewed using the Disruptive Behavior Disorders Interview (DBD) (Masseti et al., 2003). The DBD Interview measures all the DSM-IV-TR symptoms of ADHD, ODD, and Conduct Disorder (CD) on a 0-3 Likert Scale and is administered by a graduate level clinician or higher. Confirmation of ADHD symptoms at school was obtained using the DBD Teacher Rating Scale (Pelham, Gnagy, Greenslade, & Milich, 1992), which uses the same 0-3 Likert Scale as the interview assessment.

The SMD symptoms of persistently irritable or sad mood and increased reactivity to stimuli as well as the hyperarousal criteria that are not covered by the DSM-IV-TR definition of ADHD were assessed using the depression and mania modules from the Washington University Kiddie Schedule for Affective Disorders and Schizophrenia (WASH-U-KSADS). This instrument has specific questions to assess each of these domains and inquires about developmentally appropriate symptoms of pediatric mood symptoms. It also has probes designed to disentangle mood from ADHD symptoms (Geller et al., 2001; Geller, Warner, Williams, & Zimmerman, 1998; Geller, Williams, Zimmerman, & Frazier, 1996). Participants were also required to meet the additional SMD criteria as defined by the NIMH guidelines (Leibenluft et al., 2003). According to these guidelines, symptoms must have been present for the past 12 months with no more than a two-month symptom-free duration, and symptoms must have produced severe impairment in one setting and mild impairment in another. All raters were MD/PhD-level or doctoral-in-training clinicians who completed a 3-day training course by the developer of the WASH-U-KSADS. A positive symptom was defined as a score of 3 (mild symptom-severity) or higher. Parents and child were interviewed separately to enhance reporting accuracy and symptom detection. Integration of both reports was used to achieve a final composite score, with greater weight given to the reporter deemed most reliable by the interviewing clinician on an item by item basis.

To increase the ability to detect genuine mood symptoms beyond that typically seen in children with ADHD or ODD, all children meeting WASH-U-KSADS criteria underwent a detailed assessment of manic-like symptoms using the Young Mania Rating Scale (YMRS) (Fristad, Weller, & Weller, 1992; Young, Biggs, Ziegler, & Meyer, 1978; Youngstrom et al., 2004) and depressive symptoms using the Children's Depressive Rating Scale - Revised

(CDRS-R) (Poznanski & Mikos, 1996). The YMRS is a clinician-completed measure that rates 11 manic symptoms on a 4-point or 8-point Likert Scale (Young, Biggs, Ziegler, & Myer, 1978). It has been adapted for use in children and reliably distinguishes bipolar disorder from ADHD (Fristad et al., 1992; Pavuluri et al., 2005). The CDRS-R is a clinician-rated measure of children's depressive symptoms on a scale of 17-133. It is the most widely used measure of treatment effects in pediatric depression trials (March et al., 2004; Poznanski & Mikos, 1996). These two scales are the standard measures for assessing symptoms and treatment-change in clinical trials of pediatric MDD and BP (Pavuluri et al., 2005). Scores of 12+ on the YMRS and 28+ on the CDRS-R were used to define subthreshold symptoms as these are the cutoffs for remission on the respective scales. Both measures were administered by MD/PhD-level clinicians experienced in the treatment of pediatric mood disorders using the same methods described above for the WASH-U-KSADS to obtain a final composite rating.

Current and past non-affective psychopathology (other than externalizing behavior problems) was assessed using the semi-structured Kiddie Schedule for Affective Disorders and Schizophrenia-Present and Lifetime Version (KSADS-PL) (Kaufman et al., 1997). Children were excluded from the study if they met full criteria for BP I/II or any psychotic disorder, experienced prominent suicidal ideation (defined as score of 5+ on item 13 of CDRS-R) or were actively being treated with medication for a mood or anxiety disorder. Children exhibiting prominent autistic traits defined as a score greater than 15 on the Social Communications Questionnaire were also excluded. A score of 15 on this measure is considered the minimal threshold for autistic spectrum disorders (Rutter, Bailey, & Lord, 2003). Potential participants also were required to have an IQ greater than 80 as assessed by the Wechsler Abbreviated Scale of Intelligence (WASI) (The Psychological Corporation, 1999) to ensure that they had the cognitive capacities to understand important therapy principles. Participation in psychosocial treatments for internalizing disorders or past psychotropic usage was not exclusionary.

All children were required to be on a stable dose of stimulant medication to ensure that undertreated ADHD symptoms were not misinterpreted as mood symptoms. Therefore, intake ratings of SMD and associated mood symptoms as well as all subsequent study ratings reflected children's symptom levels while medicated. The study psychiatrist met with all participants and families to verify that the stimulant regimen was appropriate and effective. The stimulant dose was then held stable for the duration of therapy program.

### Therapy Setting and Content

The therapy program, abbreviated herein as AIM (which stands for the treatment of ADHD and Impaired Mood), consisted of a 9-week parent and child intervention that focused on improving outcomes for children with ADHD and SMD. AIM sessions consisted of 105-minute concurrent parent and child meetings (see Table 2). All sessions were held at an academic mental research center and were run in the evenings to minimize conflicts with work or school schedules. Components from four manualized interventions were integrated and modified for use specifically in an ADHD/SMD population. The parent groups incorporated material from *The Community Parent Education Program* (COPE)

(Cunningham, Bremner, & Secord-Gilbert, 1998) and *Multifamily Psychoeducation Groups* (MFPG) (Fristad, Gavazzi, & Soldano, 1998) while the child groups used techniques drawn from *The Summer Treatment Program* (STP) (Pelham, Greiner, & Gnagy, 1992) and Lochman's and Wells' (2004, 2008) *Coping Power Program* as well as Fristad's MFPG. All copyrighted materials were obtained with permission of the authors, three of whom were consultants for the encompassing NIH trial.

**Parent Sessions**—In AIM Parent Sessions, behavior modification principles (as detailed in Cunningham's Community Parent Education Program) were reviewed and practiced to ensure effective parenting strategies, improve parent-child relationships, maximize consistency, and improve communication difficulties. The content of these sessions included praising and attending to positive activities, planned ignoring, giving effective instructions, time out procedures, use of Premack contingencies, daily report cards, and point systems. Parent sessions also emphasized the development of structured behavior plans for dealing with predictable problems that would arise in parenting a child with ADHD and SMD, such as sustained anger events CBT principles (as detailed in Fristad's Multi-Family Psychoeducation Groups) were taught and practiced to enhance parents' recognition of triggers for negative mood states in their children and themselves. The impact of parental mood on children's behavior was reviewed as well as techniques for management of parents' own mood states (especially when their child was exhibiting problematic behaviors). Parents were instructed on how to engage in emotion coaching when their child was experiencing a dysphoric mood. A psychoeducation component that emphasized the differentiation between symptoms and normative behaviors in children, the value of regulating sleep, exercise/activity, and social schedules as well as warning signs of MDD and BP was included. Drs. Fristad and Cunningham provided ongoing consultation on the use of their interventions in this population.

Parent sessions were conducted in a group format and were facilitated by the first two authors (senior graduate student and a board certified child psychiatrist) who have a combined 15 years of experience administering behavioral parent training interventions. Parent sessions used a coping-modeling-problem-solving approach. Support from, modeling of, and reinforcement by other group members as well as the therapists are important components that function to produce, enhance, and maintain positive gains. The first 15-30 minutes of each session was devoted to a review of parents' experience with the most recent homework exercise designed to assess competence with newly learned skills as well as ascertain barriers to implementation of these skills. The second half-hour involved introduction of the new topic, usually by way of videotaped vignettes. Following the COPE model (Cunningham, Bremer, & Secord-Gilbert 1998), parents viewed videotape vignettes that displayed exaggerated parenting errors. In addition to the actual behaviors, the vignettes focused on the attributions made by the parents in the videos and their level of expressed emotion. Parents then worked together in small groups to identify errors, the short and long term impact of these errors, and went on to formulate alternative solutions to the parenting errors shown. Then, leaders discussed the topic and corresponding strategies to group members via didactic instruction and modeling. Next, subgroups completed in-session exercises and role-plays illustrating each new technique. Sessions concluded with an



explanation of the homework exercise and a review of potential barriers to implementing the exercise. Table 2 displays the format and content of the parent sessions. Families missing a session were able to complete the assigned readings and homework and were offered make-up sessions during which they could meet with one of the lead therapists.

**Child Sessions**—In AIM Child Sessions, a contingency management system was implemented modeled after the social skills program from the STP (Pelham, Greiner, & Gnagy, 1992). CBT principles as used in the Coping Power Program (Lochman, Wells, & Lenhart, 2008) were taught and practiced to enhance children's problem solving skills and promote selection of nonaggressive solutions to conflicts with peers, teachers, and parents. A modified version of Hassle Logs was used in session and homework assignments to facilitate learning of these concepts (Lochman, Wells, & Lenhart, 2008). CBT principles drawn from the MFPG (Fristad, Gavazzo, & Soldano, 1998) emphasized the differentiation of symptoms from self, the identification of different emotions, labeling the relative intensity of emotions, the influence of emotion on behavior and the development of a “tool-box” of cognitive, physical, and interpersonal coping skills. Drs. Pelham and Fristad provided ongoing consultation on the adaption of their program for this subject population.

Child sessions were conducted in a group format and facilitated by a senior graduate student in school psychology, assisted by 3 to 4 bachelors-level students majoring in psychology. Child sessions involved the use of a didactic instruction to learn novel skills and practice newly acquired skills in hands-on activities. Didactic modules emphasized active learning through use of role play, physical activities, and cooperative creation of therapy materials. A point system was developed from the STP (Pelham, Greiner, & Gnagy, 1992) and was employed throughout the sessions (except for recess time) to promote participation, prosocial behavior, and homework completion. Children earned immediate reinforcers in the form of social rewards (e.g., the child with the highest point total would get first choice of recess activities) and recess time as well as delayed reinforcers in the form of tokens, which were exchanged for gift cards at Weeks 5 and 10 (maximum of \$50 total compensation per child).

Similar to the parent group, the first 15-20 minutes of each session was devoted to reviewing the homework assignment from the prior session. The second half-hour involved introduction of the new topic usually via didactic presentation and modeling. Children then completed in-session exercises and role-plays illustrating each new technique. A brief break was held were participants were given feedback on their behavior and progress toward earned rewards. A second new skill was introduced in the following 20-30 minute segment using similar procedures that concluded with assignment of the week's homework activity. The last 20 minutes of each session was dedicated to the structured recess activity modeled after the STP (Pelham, Greiner, & Gnagy, 1992) to provide the children with opportunities to employ newly learned skills while under the supervision of study staff.

**Parallel content of child and parent sessions**—Table 2 presents the overlapping content of each parent and child session. All parent and child sessions were run in parallel with one another to ensure that parents and children were learning similar, complementary content. For example, during Session 4, children learned how to use coping skills to calm

down from hyperaroused states while parents learned how to reinforce their child for appropriate use of these coping skills. Similarly, in Session 7, parents reviewed how to give instructions in a clear, calm, and consistent fashion while children practiced listening skills and attending to nonverbal cues.

Standard program materials were developed to facilitate practice and maintenance of skills between sessions. Materials included homework planning and tracking sheets for each week's topic. Parents and children were assigned weekly homework tasks encouraging them to practice newly-learned techniques before the next session. These materials were modeled after the homework procedures used in MFPG, Coping Power, and COPE that have shown to be effective when used within a coping-modeling-problem-solving approach (Cunningham et al., 1993; Fabiano, 2005; Fristad, Gavazzi, & Soldano, 1998; Lochman, Wells, & Lenhart, 2008).

**Treatment integrity and fidelity**—A protocol for the AIM program was developed based on the evidenced-based programs from which it was modeled. All study-staff were trained in the protocol during group training sessions led by the treatment developer prior to the start of the trial. Trainees were required to demonstrate competency in the individual components of the therapy sessions as well as the point system in order to participate in the program. Weekly planning sessions were held before each session to review key concepts and to assign roles to individual therapists. All sessions were videotaped and treatment integrity was assessed after each session by the lead therapists from both groups. Feedback was then provided to all co-therapists during an additional weekly review session lead by the lead therapists (Moncher & Prinz, 1991; Waltz, Addis, Koerner, & Jacobson, 1993). High levels of treatment fidelity and therapist competence were obtained using these procedures.

## Outcome Measures

**Clinician Ratings**—Clinician ratings were completed at baseline, midpoint (i.e., Week 5), endpoint (i.e., Week 10), and 6 weeks after completing the program (i.e., Week 16) to assess the maintenance of treatment effects. Parent ratings were completed at baseline, endpoint, and follow-up except for the parent satisfaction ratings that were completed only at the endpoint assessment. Teacher ratings were obtained at baseline, midpoint, and endpoint. However, due to the study ending near the close of the school year, endpoint teacher ratings were only available from three of the participants. Because of the sizable amount of missing teacher data, these data were not analyzed. All clinician-rated assessments (i.e., CDRS-R, YMRS, CGAS) were completed by MD/PhD-level staff experienced in the assessment of childhood mood disorders. Clinician raters were not part of the therapy staff and were blind to the reason of the assessment. Participants were interviewed by the same rater at each interval.

**Impairment Ratings**—Children's impairment was assessed using the *Children's Global Assessment Scale (CGAS)*. The *CGAS* is a DSM-IV-based dimensional measure which rates the level of global functioning for an individual on a 0-100 scale, with higher numbers indicating better functioning (Shaffer et al., 1983).

**Ratings of Parenting Behavior**—Parenting behavior was assessed using the *Alabama Parenting Questionnaire (APQ)*. The APQ was used to evaluate the impact of treatment on the parenting practices of enrolled families. This questionnaire is a 42-item measure that asks parents to rate five different domains of parenting on a five-point Likert Scale (1 = *Never* and 5 = *Always*). The positive domains of parental involvement and positive parenting are rated such that higher scores indicate improvement while the negative domains of poor monitoring, inconsistent discipline, and corporal punishment are rated such that a decrease in score indicates improvement. The APQ has demonstrated acceptable internal consistency and test-retest reliability (Shelton, Frick, & Wootton, 1996).

**Ratings of Treatment Satisfaction**—Satisfaction with the AIM program was measured by parents and children completing therapy evaluation forms during the last treatment session. The 16-item parent-questionnaire asks parents to rate perceived benefits of the treatment as well as their satisfaction with the treatment using a five-point Likert Scale (e.g., 1 = *Strongly Agree* and 5 = *Strongly Disagree*; 1 = *Extremely Satisfied* and 5 = *Extremely Dissatisfied*). The last item is an opened-ended question asking parents to provide additional comments on the treatment and recommendations for future modifications. The 16-item child-questionnaire is similar but also includes ratings of specific therapy techniques used in the child sessions. It uses developmentally appropriate language so that a 7-year-old could comprehend the content. Counselors read the items aloud to the children as a group to facilitate comprehension. Both scales were derived from satisfaction measures developed for the MFPG (Fristad, 2006).

### Statistical Analysis

In this study, Cohen's  $d$  (Cohen, 1988) was used to calculate the effect size estimating the strength of the relationship between pre and post-treatment scores. More specifically, an individual's pre-treatment score was subtracted from the post-treatment score and that difference was divided by the pooled standard deviation of the population on that measure (i.e.,  $M1 - M2/\sigma^2$ ).

## Results

### Attendance

Families attended an average of eight out of nine therapy sessions. Six of the seven (86%) families completed the program, defined as missing no more than two sessions plus attending the final session. The one family who dropped out attended the first 5 sessions and completed all their endpoint and follow-up assessments so all of their data were included in analyses. According to the family, they discontinued treatment because the child was no longer having significant problems at home. Parent ratings at the time of discontinuation confirmed that most residual symptoms occurred predominantly in school versus home.

### Outcome Ratings

**Clinician Ratings**—Treatment had a large effect on both CDRS-R and YMRS ratings (CDRS-R:  $d=1.17$ ; YMRS:  $d=0.81$ ). There were no cases of new onset mania or suicidal ideation over the course of the 16 weeks. CDRS-R ratings of suicidal ideation were low at

baseline ( $M = 1.4$  on a 1-5 point scale) and declined further over time ( $M=1$ ). All gains were maintained at follow-up (see Table 3).

The data were also examined to determine whether participants exhibited a clinically meaningful change in response to treatment. On the YMRS, a positive response was defined as a decrease of at least 25% from the baseline score. A positive response on the CDRS-R was defined as a decrease of at least 40% from the baseline score. Both definitions are consistent with criterion used in pediatric mood disorder trials (Tohen et al., 2007; Wagner et al., 2003). Of the six participants showing clinically significant impairment on the YMRS at baseline (i.e., score of 12+), four met the response criterion at endpoint and follow-up. Of the four participants showing clinically significant impairment on the CDRS-R (score of 28+), two met improvement criteria post-treatment, though their gains did not remain at follow-up intervals. The one dropout was coded as a nonresponder on the YMRS and CDRS-R although the parent reported improvements at home as the reason for no longer attending the program.

**Behavioral Ratings**—Treatment exerted small effects on parental ratings of ADHD, ODD, and CD symptoms as measured by the DBD Rating Scale (ADHD:  $d=0.30$ ; ODD:  $d=0.26$ ; CD:  $d=0.27$ ). However, gains were not maintained at follow-up (see Table 3).

**Impairment Ratings**—There was a very large improvement in C-GAS scores from baseline to endpoint ( $d = 2.17$ ). The mean CGAS score at entry ( $M = 47.86$ ,  $SD=7.56$ ) was consistent with a serious level of symptoms while the endpoint score was suggestive of mild to moderate symptoms severity ( $M = 66.43$ ,  $SD= 10.7$ ). However, an appreciable worsening in functioning was seen during the follow-up phase (see Table 3).

**Ratings of Parenting Behavior**—Treatment had a small effect on increasing parental involvement with their child ( $d = -0.37$ ) and a medium effect on reducing inconsistent discipline ( $d = 0.46$ ) on the APQ. Treatment was associated with small reductions in parents' use of corporal punishment ( $d = 0.19$ ), while negligible effects were seen on the other domains of the APQ. At the follow-up assessment, observed treatment effects for parental involvement and inconsistent discipline were highly variable across subjects. More robust effects were seen at follow-up for reductions in corporal punishment ( $d = 0.93$ ) and increases in positive parenting ( $d = -0.71$ ) (see Table 3).

**Ratings of Treatment Satisfaction**—All parents were highly satisfied with the program's content, with an average rating of 1.7 on a scale of 1 to 5 (1 = Strongly Agree or Extremely Satisfied and 5 = Strongly Disagree or Extremely Dissatisfied). Additionally, parents felt that their child benefited from participation ( $M = 1$ ). Children reported learning useful new skills ( $M = 2.2$ ) and that the program improved their own behavior ( $M = 1.8$ ) and their parent's behavior toward them ( $M = 1.4$ ).

## Discussion

Youth with ADHD and SMD comprise a group of significantly impaired children that require treatments beyond traditional interventions for externalizing behavior problems to

optimize their functioning (Waxmonsky et al., 2008). Little is known about what constitutes efficacious treatment for this population, yet children with ADHD and SMD are increasingly being treated with a combination of antipsychotic and stimulant medication (Comer, Olfson, & Mojtabai, 2010; Parens, Johnston, & Carlson, 2010). In an effort to develop alternative, evidence-based treatments for these children, we developed the first psychosocial program designed to target both ADHD and SMD.

Study results support the feasibility and preliminary efficacy of this novel intervention. Children and parents rated the program as very effective, and families found the treatment to be palatable. All but one family completed the course, and the average rate of attendance was 80%. These rates are higher than those reported in other treatment studies for childhood disruptive behavior disorders, in which rates tend to average close to 50% (Miller & Prinz, 1990; Nock & Kazdin, 2005). However, it should be noted that the current pilot sample was much smaller than those in previous studies. Therapists were able to adhere to the program manual with high fidelity as confirmed by video review of all sessions. Also, the joint provision of child and parent sessions appeared to enhance the likeability of and adherence to the program. Nearly every parent reported that they were more likely to attend because they knew their child was being actively engaged in treatment at the same time. Children also endorsed liking that their parents were also an active part of their treatment.

Following nine weeks of treatment, most participants showed improvements in mood symptoms on the CDRS-R and YMRS. Based on standardized definitions of response (Tohen et al., 2007; Wagner et al., 2003), the majority of participants achieved response on the YMRS while half of the participants with depressive symptoms responded on the CDRS-R. Mean endpoint ratings on both measures were below the thresholds for remission, suggesting that participants exhibited developmentally appropriate levels of mood regulation after completing the program.

One goal of the program was to maximize gains in global functioning by incorporating parents directly into every session so that parenting practices would improve in unison with the children's acquisition of new skills to better regulate their emotion and behavior. Children reported improvements in their parents' behavior towards them as well as in their own behavior. Children's overall functioning also improved as indicated by CGAS scores. These results support the utility of this practice.

Observed effects on ADHD symptoms were smaller than those typically seen in pre-post trials of behavior therapy programs for ADHD (Fabiano et al., 2009). It could be that youth with ADHD plus SMD are less responsive to ADHD treatments delivered in traditional clinic settings as the two prior SMD trials using a psychosocial intervention took place in an in-patient psychiatric unit and an intensive therapeutic summer camp comparable to a partial hospital setting (Dickstein et al., 2009; Waxmonsky et al., 2008). Smaller effects may also have occurred because all participants were actively medicated for ADHD, and most had been working with community therapists prior to study entry. It has been difficult to detect additional benefits of behavior therapy in children medicated for ADHD (Fabiano et al., 2007; MTA, 1999). In addition, observed improvements in externalizing symptoms did not

persist at follow-up, suggesting the need for ongoing treatment to sustain benefits. Further modifications of the therapy is planned to address these issues.

The primary limitations of the study are its small sample size and lack of a control group. This was the pilot study of a new intervention for an understudied population. Therefore, this initial report focuses on describing the program and documenting its feasibility. In an attempt to provide viable outcome data under non-controlled conditions, YMRS and CDRS-R were gathered by experienced clinicians who were not part of the research team and were unaware of the nature of the study. Moreover, it is worth noting that all subjects had an extensive treatment history, yet still met full criteria for SMD and had significantly impaired functioning. Therefore, improvements simply due to passage of time were not highly likely.

The second major limitation is that SMD is a relatively new construct that overlaps significantly with ODD; as such, the validity of this diagnostic category has not been definitively established. However, recent work has found evidence of differential heritability and emotional processing deficits in youth with SMD versus those with uncomplicated behavioral disorders (Brotman et al., 2007; Brotman et al., 2010; Guyer et al., 2007). Whether or not SMD falls into the internalizing or externalizing domain, treatments for children with ADHD and dysregulated moods are needed as current ADHD treatments do not reliably improve impulsive aggression and normalize functioning within this population (Jensen et al., 2007; Waxmonsky et al., 2008).

An additional limitation was lack of booster therapy sessions. As this is the first trial of a new therapy, it was unknown to what degree observed effects would persist after treatment completion. Treatment effects for behavioral and impairment ratings symptoms were not fully maintained, suggesting the need for ongoing practice in effective parent management skills and emotion coaching. More research is needed to determine the optimal length of treatment to maintain gains. Finally, the pilot trial was set at an academic research center, did not include any female participants, enrolled families of middle to upper class socioeconomic status, and offered a small amount of financial incentives for families to participate. It is unknown if similarly efficacious results would be found in community mental health settings. However, in contrast to prior therapy trials for SMD (Dickstein et al., 2009; Waxmonsky et al., 2008), all sessions were designed to be conducted in traditional outpatient mental health settings.

### **Clinical Implications**

Both parents and children reported the novel therapy to be effective and palatable in this significantly impaired population that is increasingly being treated with polypharmacy. Further trials of the novel therapy program under controlled settings and for extended durations appear warranted. For clinicians, results suggest that some children with ADHD and prominent impairments in mood regulation not meeting full criteria for Bipolar Disorder may be treated effectively without mood stabilizing medications if a tailored psychosocial intervention is used. Therefore, persistent irritability and mood dysregulation after stabilization of ADHD symptoms does not necessarily warrant additional pharmacological treatments. Instead, a psychosocial intervention providing tools for affect recognition and management as well as effective problem solving skills appear to hold promise. Conjoint

parent sessions incorporating evidence-based techniques for managing oppositional behaviors along with psychoeducation on the impact of mood on behavior may enhance treatment effects.

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**Table 1**  
**Demographic Characteristics**

Demographic Variable	% / M (SD)
% Male	100%
Child Race/Ethnicity	57% Caucasian, 29% African American, 14% Mixed Ethnicity
% Medicated for ADHD	100%
% Receiving Concurrent Counseling	71.4%
Child's Age in Years	8.7 (1.6)
Child's IQ	101.4 (16.7)
Parent's Age in Years	40.6
Parent's Race/Ethnicity	85% Caucasian, 15% African American
Parent's Education in Years <sup>*</sup>	14.3 (2.4)

\* Mean score is equivalent to two years of college education.

**Table 2**  
**Specific Content of Parent and Child Sessions for AIM**

Session	Parent Group Content	Child Group Content
1	<p><i>Introduction to Social Learning Theory</i></p> <ol style="list-style-type: none"> <li>1 Review common symptoms seen with SMD and how they impact function</li> <li>2 Intro to Social Learning Theory</li> <li>3 Subgroup discussion of goals</li> <li>4 Parents develop goals for themselves and the family as a whole</li> <li>5 Review content of children's groups</li> </ol>	<p><i>Introduction, Symptoms versus Self, Goals</i></p> <ol style="list-style-type: none"> <li>1 Introductions and ice breaker games</li> <li>2 "Name the Enemy" exercise— to distinguish symptoms from self</li> <li>3 Identify goals for their personal "fix it list"</li> </ol>
2	<p><i>Strengths, Positive Attending</i></p> <ol style="list-style-type: none"> <li>1 Subgroup discussion of children's individual strengths</li> <li>2 Positive Attending Worksheet, videos of ineffective attending and praise, role plays and discussion in subgroups</li> </ol>	<p><i>Emotion Recognition, Promoting Positive Behaviors</i></p> <ol style="list-style-type: none"> <li>1 Large group review of physical signs of common emotions and use of "mood thermometer" to rate emotional intensity</li> <li>2 Children practice emotion naming through a computer program (DANVAS).</li> <li>3 Video vignettes to practice emotion recognition rating intensity</li> <li>4 Attending to others: Children practice giving and receiving compliments through Interview Activity</li> </ol>
3	<p><i>Emotion Recognition</i></p> <ol style="list-style-type: none"> <li>1 Instructions to large group about effectiveness of daily report card (and contingent rewards)</li> <li>2 Using a daily report card for home and school</li> <li>3 Antecedents and signs of impending anger in your child</li> </ol>	<p><i>Anger 1: What Anger Looks and Feels Like</i></p> <ol style="list-style-type: none"> <li>1 Discussion of physiology of anger</li> <li>2 Children practice identifying different intensities of anger</li> <li>3 Physical exertion task to provide practice attending to your body's cues</li> <li>4 Children identify anger reactions within their own bodies.</li> </ol>
4	<p><i>Getting Calm (Coping Skills/House Rules)</i></p> <ol style="list-style-type: none"> <li>1 Value of problem solving when child is not in an aroused state</li> <li>2 The value of a coping tool box and how to help your child build theirs</li> <li>3 Coping Tools for parents and value of attending to your emotions before engaging your child</li> <li>4 Value of set house rules</li> <li>5 House Rules Worksheet completed in subgroups</li> </ol>	<p><i>Anger 2: Coping to Get Calm</i></p> <ol style="list-style-type: none"> <li>1 Video Vignette to demonstrate calm vs. aroused states</li> <li>2 deep breathing, progressive muscle relaxation, and guided imagery exercises combined with mood thermometers to assess changes in mood</li> <li>3 Children build Coping Tool Kit and fill it as part of homework assignment</li> </ol>
5	<p><i>Responding to Problem Behaviors</i></p> <ol style="list-style-type: none"> <li>1 Review of using coping tools in parents and children</li> <li>2 Videos, role play, and discussion on planned ignoring in subgroups</li> <li>3 Large group discussion of Time Out</li> <li>4 Time Out worksheets and role play</li> <li>5 Review progress towards goals</li> </ol>	<p><i>Anger 3: How to Stay in Control</i></p> <ol style="list-style-type: none"> <li>1 Coping Tool Kit Show and Tell</li> <li>2 Large group discussion of the impact of teasing and how to cope with it</li> <li>3 Teasing exercise where children use coping tools during structured peer teasing exercise and are reinforced for displaying appropriate responses</li> </ol>

Session	Parent Group Content	Child Group Content
6	<p><i>Anger Triggers + Negative Family Cycles</i></p> <ol style="list-style-type: none"> <li>1 Review time out in large group and discuss alternatives to it</li> <li>2 Large group discussion of identifying and addressing HAB in your child and helping your child to identify perspectives and consequences</li> <li>3 Identifying and breaking negative family cycles</li> </ol>	<p><i>Perspectives and Consequences</i></p> <ol style="list-style-type: none"> <li>1 Group discussion of role of perspective on behavior and the concept of Hostile Attribution Bias (HAB)</li> <li>2 HAB video vignettes and where children identify multiple perspectives, responses and consequences of their actions</li> <li>3 Introduce modified hassle log that includes exercises on perspectives taking and consequence identification</li> </ol>
7	<p><i>Verbal and Nonverbal Communication</i></p> <ol style="list-style-type: none"> <li>1 Videos, role play, worksheet and discussion of effective commands/instructions in subgroups</li> <li>2 Videos, role play, worksheet and discussion of transitional warnings and when/then statements in subgroups</li> <li>3 How to provide constructive feedback to your child</li> <li>4 Expressed emotion and attending to nonverbal cues in yourself and your child</li> </ol>	<p><i>Verbal and Nonverbal Communication</i></p> <ol style="list-style-type: none"> <li>1 Group discussion of good listening skills.</li> <li>2 Listening skill exercise using cooperative partner task building a Lego® structure</li> <li>3 Group discussion of communication skills that includes attending to affect and body cues.</li> <li>4 Counselor lead role play where children identify communication errors and generate more appropriate alternatives and then identify consequences of using learned communication skills</li> </ol>
8	<p><i>Problem Solving</i></p> <ol style="list-style-type: none"> <li>1 Systematic approaches to problem solving within the family using the PASTE system and application to identifiable negative family cycles</li> <li>2 Videos, role play, worksheet and discussion of effective problem solving in subgroups</li> <li>3 Problem solving issues outside of the home (school, with peers, etc...)</li> <li>4 Prioritizing when there are multiple problems</li> </ol>	<p><i>Problem Solving</i></p> <ol style="list-style-type: none"> <li>1 Group discussion of problem solving skills using Stop-Think- Plan- Check model</li> <li>2 Children practice problem solving through “Building a Robot” exercise where all participants collaboratively devise and carry out a plan to complete a multi-step art task</li> </ol>
9	<p><i>Depression and Self Esteem</i></p> <ol style="list-style-type: none"> <li>1 Review link between SMD and mood disorders</li> <li>2 Signs and symptoms of Major Depression in youth with SMD</li> <li>3 Coping tools for depression in parents and children</li> <li>4 Enhancing self-esteem through friendships and activities</li> </ol>	<p><i>Depression and Self-Esteem</i></p> <ol style="list-style-type: none"> <li>1 Recognizing sadness using DANVAS and mood thermometers</li> <li>2 Group discussion of how best to use your coping tool kit dealing for sadness that includes role play of effective application of these tools</li> <li>3 Group discussion of value of talents and friends for preventing depression/negative self-image</li> <li>4 Paired interview activity to practice how to effectively engage other children and promote friendships</li> </ol>
10	<p><i>Review/Graduation &amp; Awards Ceremony</i></p> <ol style="list-style-type: none"> <li>1 Review of learned skills</li> <li>2 Exercise matching specific skills with specific problem behaviors</li> <li>3 Review progress towards goals</li> <li>4 Review of Community resources</li> <li>5 Joint graduation ceremony</li> </ol>	<p><i>Putting It All Together/Graduation &amp; Awards Ceremony</i></p> <ol style="list-style-type: none"> <li>1 Children role play scenarios modeled after common stressors at home and school that encourages use of key therapy concepts (affect recognition, use of coping tools to self soothe, developing, implementing and evaluating an action plan and use of effective communication skills)</li> <li>2 Joint graduation ceremony with personalized awards for all children</li> </ol>

*Note.* Child sessions were modeled after Dr. Mary Fristad's Multifamily Psychoeducation Groups (MFPG) for children with Major Depression or Bipolar Disorder (Fristad et al., 2009), Dr. William Pelham's Summer Treatment Program (Pelham, Greiner, & Gnagy, 1992) and Dr. John Lochman's Coping Power program for youth with recurrent aggression (Lochman, Wells, & Lenhart, 2008). Parent sessions were modeled after MFPG and the COPE program developed by Dr. Charles Cunningham (Cunningham, Bremner, & Secord-Gilbert, 1998).

\* Each week after new content was completed children and parents were assigned homework to practice new skills over the next week. Homework was reviewed during the first 15 minutes of the next session. The last 20 minutes of the child sessions were comprised of a contingent, structured recess where participants were given opportunity to practice new skills in a naturalistic setting and reinforced for applying them.

**Table 3**  
**Means, standard deviations, and effect sizes on primary dependent measures**

Outcome Variable	Pre-Treatment M (SD)	Post-Treatment M (SD)	Followup Treatment M (SD)	Cohen's d Pre - Post	Cohen's d Post-Followup	Cohen's d Pre - Followup
YMRS	14.71 (3.35)	10.43 (7.39)	9.71 (4.15)	0.81	0.13	1.43
CDRS-R	30.43 (6.29)	23.57 (6.37)	24.29 (4.03)	1.17	-0.15	1.26
DBD – ADHD	30.71 (15.67)	26.43 (14.37)	30.33 (15.19)	0.31	-0.29	0.03
DBD – ODD	12.71 (6.63)	11.29 (4.39)	12.5 (5.86)	0.27	-0.26	0.04
CGAS	47.86 (7.56)	66.43 (10.69)	53.57 (10.69)	2.17	-1.20	0.67
APQ-Parent Involvement	37.43 (7.70)	40.14 (6.90)	41.67 (7.60)	-0.37	-0.55	-0.21
APQ-Positive Parenting	26.71 (2.29)	26.43 (2.57)	28.00 (1.79)	0.12	-0.63	-0.71
APQ-Poor Monitoring	13.86 (3.24)	14.00 (2.89)	15.67 (4.32)	-0.05	-0.47	-0.43
APQ-Inconsistent Discipline	16.29 (0.49)	15.83 (2.57)	15.33 (4.84)	0.46	0.28	0.13
APQ-Corporal Punishment	4.71 (1.80)	4.43 (1.13)	3.50 (0.84)	0.19	0.86	0.93

*Note.* YMRS= Young Mania Rating Scale. CDRS-R=Children's Depression Rating Scale-Revised. DBD=Disruptive Behavior Disorders Rating Scale. ADHD=Attention-Deficit/Hyperactivity Disorder. ODD = Oppositional Defiant Disorder. CGAS=Child Global Assessment Scale. APQ=Alabama Parenting Questionnaire. On the APQ positive parenting and parental involvement subscales, higher scores represent improvements whereas lower scores represent improvements on the other three scales.